

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549

FORM S-1

REGISTRATION STATEMENT
UNDER THE SECURITIES ACT OF 1933

REAL GOODS SOLAR, INC.

(Exact name of registrant as specified in its charter)

Colorado
(State or other jurisdiction of
incorporation or organization)

3620
(Primary Standard Industrial
Classification Code Number)

26-1851813
(I.R.S. Employer
Identification Number)

**110 16th Street, 3rd Floor
Denver, Colorado 80202
(303) 222-8300**

(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

**Alan Fine
Real Goods Solar, Inc.
110 16th Street, 3rd Floor
Denver, Colorado 80202
(303) 222-8300**

(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copy to:

**Rikard Lundberg, Esq.
Brownstein Hyatt Farber Schreck, LLP
410 Seventeenth Street, Suite 2200
Denver, Colorado 80202
(303) 223-1100**

Approximate date of commencement of proposed sale to the public: As soon as practicable after the effective date of this Registration Statement.

If any of the securities being registered on this form are being offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, check the following box.

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer Accelerated filer
Non-accelerated filer Smaller reporting company
Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act.

CALCULATION OF REGISTRATION FEE

Title of Each Class of Securities to be Registered	Amount to be Registered (1)	Proposed Maximum Offering Price Per Share	Proposed Maximum Aggregate Offering Price	Amount of Registration Fee
---------------------------------------------------------------	----------------------------------------	------------------------------------------------------------------	--------------------------------------------------------------	-------------------------------------------

Class A common stock, par value \$0.0001, under Series R Warrants	17,368,421	\$	0.20(2)	\$	3,473,684.20(3)	-
Class A common stock, par value \$0.0001, under Series S Warrants	1,430,141	\$	0.01(2)	\$	14,301.41(3)	-
Class A common stock, par value \$0.0001, under WP14 warrants issued July 9, 2014	84	\$	0.16(4)	\$	13.66(4)	-
Class A common stock, par value \$0.0001, under WPA warrants issued February 27, 2015	49	\$	0.16(4)	\$	7.97(4)	-
Class A common stock, par value \$0.0001, under WPA2 warrants issued June 30, 2015	186	\$	0.16(4)	\$	30.24(4)	-
Class A common stock, par value \$0.0001, under Series G warrants issued April 1, 2016	3,322	\$	0.16(4)	\$	540.16(4)	-
Class A common stock, par value \$0.0001, under WPA3 warrants issued April 1, 2016	1,411	\$	0.16(4)	\$	229.43(4)	-
Class A common stock, par value \$0.0001, under WPA5 warrants issued December 13, 2016	30,834	\$	0.16(4)	\$	5,013.61(4)	-
Class A common stock, par value \$0.0001, under WPA6 warrants issued February 6, 2017	185,500	\$	0.16(4)	\$	30,162.30(4)	-
Class A common stock, par value \$0.0001, under WPA7 warrants issued February 9, 2017	120,000	\$	0.16(4)	\$	19,512(4)	-
Class A common stock, par value \$0.0001, under Series O warrant issued January 4, 2018	1,600,000	\$	0.16(4)	\$	260,160(4)	-
Class A common stock, par value \$0.0001, under WPA8 warrants issued January 4, 2018	128,000	\$	0.16(4)	\$	20,812.80(4)	-
Class A common stock, par value \$0.0001, under Series Q warrants issued April 9, 2018	317,678(5)	\$	0.16(4)	\$	51,654.43(4)	-
Class A common stock, par value \$0.0001, under WPA9 warrants issued April 9, 2018	730,160	\$	0.16(4)	\$	118,724.02(4)	-
Class A common stock, par value \$0.0001, under WPA10 warrants issued April 2, 2019	1,389,474	\$	0.16(4)	\$	225,928.47(4)	-
Total Fee	-		-		\$	511.56
Total Fee Due					\$	0.00(6)

- (1) This Registration Statement also relates to an indeterminate number of shares of the registrant's Class A common stock that may be offered or issued to prevent dilution resulting from stock splits, stock dividends or similar transactions in accordance with Rule 416 under the Securities Act of 1933, as amended (the "Securities Act").
- (2) The Series R Warrants and Series S Warrants are exercisable into shares of Class A common stock at a current exercise price per share as indicated in the table and may be exercised in a cashless exercise under certain circumstances. The exercise price of the warrants and the number of shares underlying the warrants are subject to adjustment in the event of certain stock dividends and distributions, stock splits, stock combinations, reclassifications or similar events affecting the Class A common stock. Calculated pursuant to Rule 457(o), based on the Proposed Maximum Offering Price Per Share.
- (3) Calculated pursuant to Rule 457(o) based on an estimate of the Proposed Maximum Aggregate Offering Price.
- (4) Estimated solely for the purpose of computing the amount of the registration fee pursuant to Rule 457(c) under the Securities Act using \$0.16, the average of the high and low prices reported on the OTCQX on April 12, 2016, a date within five trading days prior to the date of the filing of this registration statement.
- (5) Represents 135% of the shares of Class A common stock currently issuable under the Series Q Warrants due to a contractual obligation to register such amount.
- (6) Pursuant to Rule 457(p) under the Securities Act, the registrant is offsetting the registration fee due under this Registration Statement by \$511.56 with \$716.91 remaining to be applied to future filings, which represents the registration fee previously paid with respect to the Registration Statement on Form S-3 (File No. 333-210842), initially filed on April 20, 2016 and withdrawn from registration on May 13, 2016. Accordingly, the filing fee due in connection with this filing is \$0.00.

The registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the registrant shall file a further amendment which specifically states that this registration statement shall thereafter become effective in accordance with section 8(a) of the Securities Act, or until the registration statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said section 8(a), may determine.

Pursuant to Rule 429 promulgated under the Securities Act of 1933, as amended, the prospectus forming a part of this Registration Statement on Form S-1 is a combined prospectus relating to (i) the offer and sale by the Registrant of up to 18,798,562 shares of Class A common stock upon exercise of outstanding Series R Warrants and Series S Warrants, which are currently registered for issuance on the Registrant's Registration Statement on Form S-3 (Registration No. 333-215985), effective on July 21, 2017 (the "First Prior S-3"), (ii) the resale by selling shareholders of up to 3,330,590 shares of Class A common stock issuable upon exercise of outstanding warrants not previously registered, (iii) the resale by selling shareholders of up to 84 shares of Class A common stock issuable upon exercise of outstanding WP14 warrants issued on July 9, 2014, which are currently registered for resale on the Registrant's Registration Statement on Form S-3 (Registration No. 333-197766), effective on August 11, 2014 (the "Second Prior S-3"), (iv) the resale by selling shareholders of up to 186 shares of Class A common stock issuable upon exercise of outstanding WPA2 warrants issued on June 30, 2015, which are currently registered for resale on the Registrant's Registration Statement on Form S-3 (Registration No. 333-206271), effective on August 20, 2015 (the "Third Prior S-3"), (v) the resale by selling shareholders of up to (A) 128,000 shares of Class A common stock issuable upon exercise of outstanding WPA8 warrants issued on January 4, 2018, (B) 317,678 shares of Class A common stock issuable upon exercise of outstanding Series Q warrants issued on April 9, 2018, and (C) 730,160 shares of Class A common stock issuable upon exercise of outstanding WPA9 warrants issued on April 9, 2018, all of which are currently registered for resale on the Registrant's Registration Statement on Form S-3 (Registration No. 333-227238), effective on September 20, 2018 (the "Fourth Prior S-3").

This Registration Statement constitutes Post-Effective Amendment No. 1 to each of the First Prior S-3, the Second Prior S-3, the Third Prior S-3 and the Fourth Prior S-3. A portion of the offering under the Fourth Prior S-3 related to the resale of shares of Class A common stock issuable upon conversion of convertible notes due April 9, 2018 has terminated but the portion of the offering under the Fourth Prior S-3 described above in clause (v) is being continued on this registration statement by way of post-effective amendment to the Fourth Prior S-3. The unsold securities registered on the Fourth Prior S-3 related to the terminated portion of the offering are hereby removed from registration.

The information in this prospectus is not complete and may be changed without notice. We may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities and we are not soliciting offers to buy these securities in any state where the offer or sale of these securities is not permitted.

Subject to completion, dated April 15, 2019

PRELIMINARY PROSPECTUS



REAL GOODS SOLAR, INC.
18,798,562 shares of Class A common stock by us
4,506,698 shares of Class A common stock by selling shareholders

This prospectus relates to (i) the offering by us of up to 18,798,562 shares of Class A common stock of Real Goods Solar, Inc. (“Common Stock”) upon exercise of existing Series R Warrants and Series S Warrants (collectively, the “Shelf Warrants”), and (ii) the offering by selling shareholders identified in this prospectus and any of their respective pledgees, donees, transferees, or other successors in interest of up to 4,506,698 shares of Common Stock issuable upon exercise of other outstanding warrants described below, which includes 135% of the aggregate number of shares of Common Stock issuable upon the exercise of the Series Q Warrants (such other warrants, collectively, the “Private Warrants” and, together with the Shelf Warrants, collectively, the “Warrants”).

The Shelf Warrants were originally issued pursuant to an effective registration statement on Form S-3 File No. 333-215985 filed on February 9, 2017, as amended on July 11, 2017 (the “Shelf Registration Statement”), which was declared effective on July 21, 2017 and will no longer be available after the next update under Section 10(a)(3) of the Securities Exchange Act of 1934, as amended (the “Exchange Act”). This registration statement is being filed in part to replace the Shelf Registration Statement with respect to the Shelf Warrants and trigger the grace period afforded by Rule 415(a)(5) so that the Shelf Warrants covered by the Shelf Registration Statement may continue to be offered and sold during the grace period in accordance with Rule 415(a)(5) and (a)(6).

The Private Warrants were issued in various private placement transactions and, with respect to some of them, the shares of Common Stock issuable upon exercise were registered for resale pursuant to the registration statements described below. This registration statement is being filed in part to replace such prior registration statements with respect to the Private Warrants.

We will receive proceeds from payments in cash of the exercise price of the Shelf Warrants. If all of the Shelf Warrants are exercised for cash, we will receive total proceeds, before expenses, of \$3,487,986. If at any time after there is no effective registration statement on file with the SEC registering, or no current prospectus available for, the issuance or resale of the shares of our Common Stock issuable upon exercise of the Warrants, the Warrants may be exercised by means of a “cashless exercise” and we will not receive any proceeds at such time. We will not receive any of the proceeds from the sale of the Common Stock by the selling shareholders.

The selling shareholders and their respective pledgees, donees, transferees, or other successors in interest may offer the shares of Common Stock in one or more transactions at fixed prices, at prevailing market prices at the time of sale, at varying prices determined at the time of sale, at negotiated prices, or in trading markets for our Common Stock. Additional information on the selling shareholders, and the times and manner in which they may offer and sell shares of our Common Stock under this prospectus is provided under “Selling Shareholders” and “Plan of Distribution” in this prospectus.

The table below indicates the current exercise prices, number of shares of Common Stock issuable under, the issuance dates and expiration dates of the Warrants, as well as if any existing registration statement relates to such Warrants.

Warrant	Current Exercise Price	Number of Shares	Issuance Date	Expiration Date	Prior Registration Statement
WP14	\$ 38,280	84	July 9, 2014	January 9, 2020	333-197766
WPA	\$ 6,000	49	February 27, 2015	February 22, 2020	N/A
WPA2	\$ 744	186	June 30, 2015	June 26, 2020	333-206271
Series G	\$ 1.36	3,322	April 1, 2016	October 1, 2021	N/A
WPA3	\$ 496.80	1,411	April 1, 2016	March 1, 2021	N/A
WPA5	\$ 10.50	30,834	December 13, 2016	December 8, 2021	N/A
WPA6	\$ 3.88	185,500	February 6, 2017	February 1, 2022	N/A
WPA7	\$ 3.13	120,000	February 9, 2017	February 7, 2022	N/A
Series O	\$ 1.47	1,600,000	January 4, 2018	July 4, 2023	N/A
WPA8	\$ 1.47	128,000	January 4, 2018	July 4, 2023	333-227238
		235,317			
		(317,678 if			
Series Q	\$ 0.19	135%)	April 9, 2018	April 9, 2023	333-227238
WPA9	\$ 0.19	730,160	April 9, 2018	April 9, 2023	333-227238
Series R	\$ 0.20	17,368,421	April 2, 2019	April 2, 2024	333-215985
Series S	\$ 0.01	1,430,141	April 2, 2019	April 2, 2024	333-215985
WPA10	\$ 0.25	1,389,474	April 2, 2019	April 2, 2024	N/A

Our Common Stock is quoted on the OTCQX under the symbol "RGSE." On April 12, 2019, the last reported sale price of our Common Stock was \$0.16 per share.

Investing in our securities involves a high degree of risk. See "Risk Factors" beginning on page 5 of this prospectus and in the documents incorporated by reference herein and therein. You should read this entire prospectus carefully before you make your investment decision.

NEITHER THE SECURITIES AND EXCHANGE COMMISSION NOR ANY STATE SECURITIES COMMISSION HAS APPROVED OR DISAPPROVED OF THESE SECURITIES OR PASSED UPON THE ADEQUACY OR ACCURACY OF THIS PROSPECTUS. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

The date of this prospectus is _____, 2019.

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ABOUT THIS PROSPECTUS

Except where the context requires otherwise, in this prospectus the terms “Company,” “our company,” “Real Goods Solar,” “RGS Energy,” “we,” “us,” and “our” refer to Real Goods Solar, Inc., a Colorado corporation, and where appropriate, its direct and indirect subsidiaries.

You should rely only on the information contained or incorporated by reference in this prospectus. We have not authorized any other person to provide you with different information or to make any representations other than those contained in this prospectus. If anyone provides you with different or inconsistent information, you should not rely on it. We take no responsibility for, and provide no assurance as to the reliability of, any other information that others may give you. For further information, please see the section of this prospectus entitled “Where You Can Find More Information.” We are not and the selling shareholders are not making an offer to sell these securities in any jurisdiction where the offer or sale is not permitted.

You should not assume that the information appearing in this prospectus is accurate as of any date other than the date on the front cover of this prospectus, regardless of the time of delivery of this prospectus or any sale of a security. Our business, financial condition, results of operations, and prospects may have changed since those dates.

This prospectus contains trademarks, tradenames, service marks, and service names of the Company.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference herein may contain forward-looking statements within the meaning of the U.S. Private Securities Litigation Reform Act of 1995 that involve risks and uncertainties, including statements regarding our results of operations and financial positions, and our business and financial strategies. Forward-looking statements are neither historical facts nor assurances of future performance. Instead, they provide our current beliefs, expectations, assumptions and forecasts about future events, and include statements regarding our future results of operations and financial position, business strategy, budgets, projected costs, plans and objectives of management for future operations. The words “anticipate,” “believe,” “plan,” “estimate,” “expect,” “future,” “intend,” “strategy,” “likely,” “seek,” “may,” “will” and similar expressions as they relate to us are intended to identify such forward-looking statements. Because forward-looking statements relate to the future, they are subject to inherent uncertainties, risks and changes in circumstances that are difficult to predict and many of which are outside of our control. Our actual results and financial condition may differ materially from those indicated in the forward-looking statements. Therefore, you should not rely on any of these forward-looking statements.

Important factors that could cause our actual results and financial condition to differ materially from those indicated in the forward-looking statements include, without limitation, the following: our history of operating losses; our ability to implement our revenue growth strategy, achieve our target level of sales, generate cash flow from operations, and achieve break-even and better results; our ability to achieve profitability; our ability to generate breakeven cash flow to fund our operations; our success in implementing our plans to increase future sales, and installations and revenue; rules, regulations and policies pertaining to electricity pricing and technical interconnection of customer-owned electricity generation such as net energy metering; the continuation and level of government subsidies and incentives for solar energy; existing and new regulations impacting solar installations including electric codes; future shortages in supplies for solar energy systems; the adoption and general demand for solar energy; the impact of a drop in the price of conventional energy on demand for solar energy systems; seasonality of customer demand and adverse weather conditions inhibiting our ability to install solar energy systems; changing and updating technologies and the issues presented by these new technologies related to customer demand and our product offering; geographic concentration of revenue from the sale of solar energy systems in east coast states; non-compliance with or loss or suspension of licenses required for installation of solar energy systems; loss of key personnel and ability to attract necessary personnel; our failure to accurately predict future warranty claims; adverse outcomes arising from litigation and legal disputes to which we may be subject from time to time; our ability to continue to obtain services and components from suppliers, installers and other vendors; disruption of our supply chain from equipment manufacturers and potential shortages of components for solar energy systems; factors impacting the timely installation of solar energy systems; competition; costs associated with safety and construction risks; continued access to competitive third party financiers to finance customer, roofer and homebuilder solar or POWERHOUSE™ 3.0 installations; the ability to obtain requisite international product certification of POWERHOUSE™ 3.0; our ability to successfully and timely commercialize POWERHOUSE™ 3.0 during 2019 and in future years achieve market share; our ability to satisfy the conditions and our obligations under the POWERHOUSE™ 3.0 license agreement; our ability to manage supply chain in order to have production levels and pricing of the POWERHOUSE™ 3.0 shingles to be competitive; our ability to successfully expand our operations and employees and realize profitable revenue growth from the sale and installation of POWERHOUSE™ 3.0, and to the extent, anticipated; our ability to realize revenue from sales of POWERHOUSE™ arising from the California Energy Commissions' mandate for solar systems with new home building commencing in 2020; our ability to realize revenue from written reservations for initial POWERHOUSE™ 3.0 deliveries; our ability to obtain future written reservations and purchase orders for POWERHOUSE™ 3.0 deliveries; competition in the built-in photovoltaic solar system business; our ability to successfully and timely expand our POWERHOUSE™ 3.0 business outside of the United States; increases in the cost of materials as a result of changes in the price of oil and foreign currency exchange risks; intellectual property infringement claims related to the POWERHOUSE™ 3.0 business; the performance of the Solar Division; the adequacy of, and access to, capital necessary to implement our revenue growth strategy; our ability to get shareholder approval to increase the authorized number of shares of our Common Stock in connection with an equity financing; whether we will receive any proceeds from exercise of Common Stock warrants; changes in general economic, business and political conditions, including tariffs or trade remedies regarding imported solar panels, cells, inverters, batteries or other products related to our business and changes in the financial markets; the impact on future hypothetical earnings per share of future employee incentive compensation by cash bonuses and stock option awards; our ability to meet customer expectations; risks and liabilities associated with placing employees and technicians in our customers' homes and businesses; product liability claims; the probability of the occurrence and potential magnitude of cybersecurity incidents; the adequacy of preventative actions taken to reduce cybersecurity risks and the associated costs, including, if appropriate, discussing the limits of our ability to prevent or mitigate certain cybersecurity risks; future data security breaches or our inability to protect personally identifiable information or other information about our employees and customers; the volatile market price of our Common Stock; the dilutive effect of future issuances of stock, options, warrants or other securities and the effect on the market price of our Common Stock; the low likelihood that we will pay any cash dividends on our Common Stock for the foreseeable future; anti-takeover provisions in our organizational documents; the terms of some of our outstanding securities and transaction documents entered into in connection with past offerings restrict our ability to enter into certain transactions or obtain financing, and could result in our paying premiums or penalties to the holders of some of our outstanding securities; our ability to identify or complete a strategic alternative that yields value for our shareholders; and such other factors as discussed in this prospectus and throughout Part I, Item 1A, Risk Factors and Part II, Item 7, Management's Discussion and Analysis of Financial Conditions and Results of Operations included in future Annual Reports on Form 10-K and Part I, Item 2, Management's Discussion and Analysis of Financial Conditions and Results of Operations and Part II, Item 1A, Risk Factors included in future Quarterly Reports on Form 10-Q.

Any forward-looking statement made by us in this prospectus and the documents incorporated by reference herein and therein is based only on information currently available to us and speaks only as of the date on which it is made. We undertake no obligation to publicly update any forward-looking statement, whether written or oral, that may be made from time to time, whether as a result of new information, future developments or otherwise, except as required by applicable law.

PROSPECTUS SUMMARY

This prospectus summary highlights important features of this offering and the information included or incorporated by reference in this prospectus. Because it is a summary, it may not contain all of the information that may be important to you. You should carefully read this entire prospectus, including the section entitled "Risk Factors."

Overview of our Company

RGS Energy has provided solar energy systems to homeowners, and commercial building owners in the United States since 1978. We believe that solar energy adoption is still in the early stages and will continue to increase as utility rates rise and customers become more knowledgeable about the savings clean and sustainable solar energy can deliver. RGS and our predecessors have installed over 26,000 solar energy systems across the continental United States and Hawaii.

We endeavor to make the move to solar energy simple for our customers by managing and executing the process with our sales and installation teams. We design and offer a suitable solar energy solution, then procure, permit, install, and interconnect the system to the utility grid. We provide a comprehensive workmanship warranty on each fully operational system.

On September 29, 2017 we executed an exclusive domestic and international world-wide Technology License Agreement (the "License") with Dow Global Technologies LLC ("Dow") for its POWERHOUSE™ in-roof solar shingle, an innovative and aesthetically pleasing solar shingle system developed by Dow. The POWERHOUSE™ 1.0 and 2.0 versions used CIGS (copper indium gallium selenide solar cells) technology which had a high manufacturing cost, resulting in the product not being consumer price friendly. Conversely, the POWERHOUSE™ 3.0 has been developed with traditional silicon solar cells to increase solar production and to provide a competitive consumer price point. On November 2, 2018 we received United Laboratories ("UL") certification for POWERHOUSE™ 3.0 and began to commercialize the product in North America. We have engaged third-party manufacturers for production and distribution logistics and to provide services to the home building and roofing industries.

We were incorporated in Colorado in 2008 as a successor to Gaiam Energy Tech, Inc. founded in 1999.

A description about our operating segments and the financial information about our segments may be found in Note 15. Segment Information, to our audited financial statements, included in Item 8 of the Financial Statements included in this prospectus.

Our principal executive offices are located at 110 16th Street, 3rd Floor, Denver, CO 80202. Our telephone number is (303) 222-8300. Our website is www.rgsenergy.com. The information on our website is not intended to be a part of this prospectus, and you should not rely on any of the information provided there in making your decision to invest in our securities. Our website address referenced above is intended to be an inactive textual reference only and not an active hyperlink to our website.

Recent Developments

The Nasdaq Stock Market LLC suspended trading of our Common Stock on February 15, 2019 and filed a Form 25-NSE with the Securities and Exchange Commission (the "SEC") on March 12, 2019, which delisted the Common Stock from Nasdaq at the opening of the trading session on March 22, 2019 and is expected to deregister the Common Stock from Section 12(b) of the Act on June 10, 2019.

On March 7, 2019, we announced we had commenced a process to explore strategic alternatives focusing on maximizing shareholder value. Strategic alternatives to consider may include, among others, a sale of the Company, a business combination such as a merger with another party, or a strategic investment financing which would allow the Company to continue its current business plan of commercializing POWERHOUSE™ solar shingles. We have not set a timeline for this process and there can be no assurance that the strategic alternatives review process will result in a transaction or other strategic change or outcome. We do not expect to discuss or disclose further developments regarding the strategic alternatives review process unless and until our Board of Directors has approved a specific course of action or we have otherwise determined that further disclosure is appropriate or required by law.

On March 27, 2019, our Board of Directors determined to exit our mainland residential solar business to focus on the POWERHOUSE™ in-roof shingle market and reduce overall cash outflow, with the goal of maximizing future shareholder value. We believe this structure and realignment enables us to effectively manage our operations and resources. This realignment is expected to result in the reduction of workforce payroll plus burden of approximately \$4.0 million annually. Revenues and net loss in 2018 for the mainland residential solar business were approximately \$8.9 million and \$6.3 million, respectively. In order for us to convert our existing backlog to revenue, we plan to use authorized integrators to complete installations throughout the remainder of 2019.

As previously reported on Form 8-K filed April 4, 2019, on April 2, 2019, we closed a registered offering (the “April 2019 Offering”) in which we issued and sold (i) 15,938,280 shares of Common Stock, (ii) Series S Warrants to purchase 1,430,141 shares of Common Stock and (iii) Series R Warrants to purchase 17,368,421 shares of Common Stock pursuant to the terms of the Securities Purchase Agreement dated April 2, 2019 between us and three institutional and accredited investors. The investors paid \$0.19 per share of Common Stock and \$0.18 per share of Common Stock underlying the Series S Warrant for aggregate gross proceeds of \$3.3 million at the closing and before \$0.35 million of expenses.

The Offering

Issuer Real Goods Solar, Inc.

Common Stock offered by us We are offering shares of Common Stock pursuant to the Shelf Warrants described below.

Warrant	Current Exercise Price	Issuance Date	Number of Shares	Expiration Date
Series R	\$ 0.20	April 2, 2019	17,368,421	April 2, 2024
Series S	\$ 0.01	April 2, 2019	1,430,141	April 2, 2024

The Shelf Warrants may be exercised in whole or in part, upon the election of the holder at any time at the current exercise price and until the expiration date set forth above.

Common Stock outstanding after the offering by us 127,701,316 shares (assuming full exercise of the Shelf Warrants, but no exercise of the Private Warrants). This figure does not take into account any shares of Common Stock issuable in the future upon the exercise of currently outstanding derivative securities other than the Shelf Warrants.

Use of Proceeds from offering by us Any proceeds from the sale of shares of Common Stock issuable upon exercise of the Shelf Warrants will be used for (i) the commercialization of the POWERHOUSE™ product, and (ii) for general corporate purposes.

See the section entitled “*Use of Proceeds*” beginning on page 24 of this prospectus.

Plan of Distribution for the offering by us From time to time after the date of this prospectus, we will directly offer and issue the shares of Common Stock issuable under the Shelf Warrants to the holders upon exercise in accordance with their terms.

See the section entitled “*Plan of Distribution*” beginning on page 33 of this prospectus for a complete description of the manner in which the shares registered hereby may be distributed.

Common Stock offered by the selling shareholders 4,506,698 shares issuable upon exercise of the Private Warrants (including 135% of the shares of Class A common stock issuable under the Series Q Warrants).

Common Stock outstanding after the offering by the selling shareholders	113,409,452 shares (assuming full exercise of the Private Warrants, but no exercise of the Shelf Warrants and including 135% of the shares of Class A common stock issuable under the Series Q Warrants). This figure does not take into account any shares of Common Stock issuable in the future upon the exercise of currently outstanding derivative securities other than the Private Warrants.
Use of Proceeds from offering by selling shareholders	We will not receive any proceeds from the sale of shares of Common Stock issuable upon exercise of the Private Warrants, but we will receive the exercise price of such warrants if they are exercised (unless exercised by means of a “cashless exercise,” in which case we will not receive any exercise price). See the section entitled “ <i>Use of Proceeds</i> ” beginning on page 24 of this prospectus.
Plan of Distribution for the offering by the selling shareholders	The selling shareholders and their pledgees, donees, transferees, or other successors in interest may offer the shares of Common Stock issuable under the Private Warrants in one or more transactions at fixed prices, at prevailing market prices at the time of sale, at varying prices determined at the time of sale, at negotiated prices, or in trading markets for our Common Stock. See the section entitled “ <i>Plan of Distribution</i> ” beginning on page 33 of this prospectus for a complete description of the manner in which the shares registered hereby may be distributed.
Common Stock outstanding before the offerings described above	108,902,754 shares as of April 12, 2019
Market for our Common Stock and Symbol	The OTCQX, symbol “RGSE”
Risk Factors	Investing in our Common Stock involves a high degree of risk. See the section entitled “ <i>Risk Factors</i> ” beginning on page 5 of this prospectus and under similar headings in the other documents that are filed after the date hereof and incorporated by reference into this prospectus, together with the other information included in or incorporated by reference into this prospectus before deciding whether to invest in our Common Stock.

RISK FACTORS

An investment in our securities involves a high degree of risk. Before making an investment decision you should carefully read and consider the risks described below, together with all of the other information included or incorporated by reference in this prospectus, including, without limitation, the risk factors in the section entitled “Risk Factors” in our most recent Annual Report on Form 10-K, which are on file with the SEC. If any of the risks listed in our most recent Annual Report on Form 10-K or any of the following risks actually occur, our business, financial condition, and/or results of operations could suffer. In that case, the market price of our Common Stock could decline, and you may lose all or part of your investment. You should read the section entitled “Special Note Regarding Forward-Looking Statements” above for a discussion of what types of statements are forward-looking statements, as well as the significance of such statements in the context of this prospectus. Additional risks and uncertainties that we do not presently know or that we currently deem immaterial may also have a material adverse effect on our business.

Risks Related to the Offering

Management will have broad discretion as to the use of the net proceeds from this offering, and Real Goods Solar may not use the proceeds effectively.

Management will have broad discretion as to the application of the net proceeds from this offering. Our shareholders may not agree with the manner in which management chooses to allocate and spend the net proceeds. Moreover, management may use the net proceeds for corporate purposes that may not increase our profitability or market value.

Warrant holders who exercise the Warrants may experience immediate and substantial dilution

The exercise price of the Warrants associated with the shares of Common Stock offered pursuant to this prospectus may be substantially higher than the net tangible book value per share of Common Stock. In that situation, if you exercise your Warrant, you will incur immediate and substantial dilution in the net tangible book value per share of Common Stock from the exercise price you pay. Moreover, we have a substantial number of stock options and warrants to purchase Common Stock outstanding. If the holders of outstanding options or warrants exercise those options and warrants at prices below the exercise price you paid, you will incur further dilution.

The exercise prices are not indications of our value.

The exercise prices of the Warrants may not necessarily bear any relationship to the book value of our assets, past operations, cash flows, losses, financial condition or any other established criteria for value. You should not consider the exercise price as an indication of the value of the Common Stock underlying the Warrants. After the date of this prospectus, the Common Stock may trade at prices above or below such exercise prices.

The public trading market for the Common Stock may be limited in the future.

Effective February 15, 2019, the Common Stock is quoted on the OTCQX under the symbol "RGSE." Any over-the-counter market quotations reflect inter-dealer prices, without retail mark-up, mark-down or commissions and may not necessarily represent actual transactions. Prior to such date, the Common Stock traded on the Nasdaq Capital Market under the same symbol. The trading volume for the Common Stock fluctuates and, in the past, there have been time periods during which the Common Stock trading volume has been limited. Management can make no assurances that trading volume will not be similarly limited in the future. Without an active trading market, there can be no assurance of any liquidity or resale value of the Common Stock, and shareholders may be required to hold shares of the Common Stock for an indefinite period of time.

Risk Factors Related to our Business and Industry

We have a history of operating losses, and it is uncertain when, or if, we may be able to achieve or sustain future profitability. If we do not become profitable on an ongoing basis, we may be unable to continue our operations.

We have incurred net losses and have an accumulated deficit of \$243 million as of December 31, 2018. If we cannot improve our operating results and ultimately generate net income, we may be unable to continue our operations in the future.

Our financial statements as of December 31, 2018 were prepared under the assumption that we will continue as a going concern. The independent registered public accounting firm that audited our 2018 financial statements, in their report, included an explanatory paragraph referring to our recurring losses and expressed substantial doubt in our ability to continue as a going concern. Management also concluded that substantial doubt exists in our ability to continue as a going concern, and our financial statements do not include any adjustments that might result from the outcome of this uncertainty. Our ability to continue as a going concern depends on our ability to obtain additional equity or debt financing, increase sales and installations, attain further operating efficiencies, reduce expenditures, and ultimately, to generate revenue.

We need to successfully commercialize POWERHOUSE™ or increase our sales, installations and revenue in order to achieve our goal of operating profitability.

Our current levels of sales, installations and revenue are insufficient for profitable operations. We believe we must commercialize POWERHOUSE™ 3.0, the principle component of our revenue growth strategy, to achieve our goal of operating profitably. Alternatively, we must increase our sales, installations and revenue in our Solar Division to achieve our goal of operating profitably. If we are unsuccessful in executing these plans, we will be unable to increase revenue and will not achieve our goal of operating profitability.

We have a history of negative cash flows from operations, and it is uncertain when, or if, in the future we will be able to achieve or sustain positive cash flow from operations.

There can be no assurance in the future that we will generate sufficient cash flow from operations or obtain funds from future financings or other sources to fund operations or other liquidity needs which could have important adverse consequences to us, such as:

- limiting our ability to obtain additional financing;
- making it more difficult for us to satisfy our obligations with respect to future indebtedness;
- limiting our ability to respond to changing business, industry and economic conditions and to withstand competitive pressures, which may affect our financial condition;
- limiting our ability to make investments, dispose of assets, pay cash dividends or repurchase stock;
- increasing our vulnerability to downturns in our business, our industry or the general economy and restricting us from making improvements or acquisitions or exploring business opportunities; and
- placing us at a competitive disadvantage to competitors with greater resources.

Our future operating performance and our ability to service indebtedness will be subject to future economic conditions and to financial, business and other factors, many of which are beyond our control.

Existing rules, regulations and policies pertaining to electricity pricing and technical interconnection of customer-owned electricity generation and changes to these regulations and policies may deter the purchase and use of solar energy systems and negatively impact development of the solar energy industry.

The market for solar energy systems is heavily influenced by foreign, federal, state and local government regulations and policies concerning the electric utility industry, as well as policies adopted by electric utilities. These regulations and policies often relate to electricity pricing and technical interconnection of customer-owned electricity generation. For example, the vast majority of states have a regulatory policy known as net energy metering, or “net metering”, which allows our customers to interconnect their on-site solar energy systems to the utility grid and offset their utility electricity purchases by receiving a bill credit at the utility’s retail rate for energy generated by their solar energy system that is exported to the grid and not consumed on-site. In this way, the customer pays for the net energy used or receives a credit at the retail rate if more electricity is produced than consumed. In some states, net metering is being replaced with lower credits for the excess electricity sent onto the grid from solar energy systems, and utilities are imposing minimum or fixed monthly charges on owners of solar energy systems. These regulations and policies have been modified in the past and may be modified in the future in ways that can restrict the interconnection of solar energy systems and deter purchases of solar energy systems by customers. In addition, electricity generated by solar energy systems competes most favorably in markets with tiered rate structures or peak hour pricing that increase the price of electricity when more is consumed. Modifications to these rate structures by utilities, such as reducing peak hour or tiered pricing or adopting flat rate pricing, could require the price of solar energy systems to be reduced in order to compete with the price of utility generated electricity.

The reduction, elimination or expiration of government subsidies and economic incentives for solar energy systems could reduce the demand for our products and services.

U.S. federal, state and local government bodies and utilities provide incentives to end-users, distributors, system integrators and manufacturers of solar energy systems to promote solar electricity in the form of rebates, tax credits and other financial incentives such as system performance payments and payments for renewable energy credits associated with renewable energy generation. These incentives enable us to lower the price we charge our customers for solar energy systems. However, these incentives may expire on a particular date, end when the allocated funding is exhausted, or be reduced or terminated as solar energy adoption rates increase. These reductions or terminations often occur without warning. In addition, applicable authorities may adjust or decrease incentives from time to time or include provisions for minimum domestic content requirements or other requirements to qualify for these incentives. The reduction, elimination or expiration of such incentives or delays or interruptions in the implementation of favorable federal or state laws could substantially increase the cost of our systems to our customers, resulting in a significant reduction in demand for our solar energy systems, which would negatively impact our business.

Existing regulations, and changes to such regulations, may present technical, regulatory and economic barriers to the installation of solar energy systems, which may significantly reduce demand for our solar energy systems.

The installation of solar energy systems is subject to oversight and regulation under local ordinances; building, zoning and fire codes; environmental protection regulation; utility interconnection requirements for metering; and other rules and regulations. We attempt to keep up-to-date on these requirements on a national, state and local level and must design and install our solar energy systems to comply with varying standards. Certain jurisdictions may have ordinances that prevent or increase the cost of installation of our solar energy systems. In addition, new government regulations or utility policies pertaining to the installation of solar energy systems are unpredictable and may result in significant additional expenses or delays, which could cause a significant reduction in demand for solar energy systems.

An increase in our cost of materials could arise as a result of the United States imposing trade remedies on imported solar panels, cells, inverters, batteries or other products related to our business.

During 2018, the United States and China each imposed new tariffs on various products imported from the other country. The U.S. tariffs include an additional 25% tariff on solar panels and cells that are manufactured in China and a tariff on inverters, certain batteries and other electrical equipment currently set at 25% effective January 1, 2019. The United States also has, from time to time, imposed, or announced tariffs on goods imported from other countries we use in our business. We cannot predict what actions may ultimately be taken with respect to tariffs or trade relations between the United States and other countries, what products may be subject to such actions, or what actions may be taken by the other countries in retaliation. The adoption and expansion of trade restrictions, the occurrence of a trade war, or other governmental action related to tariffs or trade agreements or policies has the potential to adversely impact our supply chain, our costs, our suppliers, and the U.S. economy, which could in turn adversely affect our business, financial condition and results of operation.

An increase in our cost of materials could arise as a result of changes in the price of oil and the foreign currency exchange rate for Chinese yuan.

The baseplate of our POWERHOUSE™ in-roof solar shingle is plastic and, accordingly, changes in the price of oil will affect our cost of this material. Currently, we purchase the solar laminate for our POWERHOUSE™ in-roof solar shingle from a Chinese manufacturer, and, accordingly, changes in the Chinese yuan versus the US Dollar will affect our cost of this material.

Although currently there is no shortage of supplies for solar energy systems, from time to time in the past, shortages have occurred and have impacted solar companies such as us. Shortages in the supply of silicon and inverters or supply chain issues could adversely affect the availability and cost of the solar photovoltaic modules used in our solar energy systems.

Shortages of silicon and inverters or supply chain issues could adversely affect the availability and cost of our solar energy systems. Manufacturers of photovoltaic modules depend upon the availability and pricing of silicon, one of the primary materials used in photovoltaic modules. The worldwide market for silicon from time to time experiences a shortage of supply, which can cause the prices for photovoltaic modules to increase and supplies to become difficult to obtain. While we have been able to obtain sufficient supplies of solar photovoltaic modules to satisfy our needs to date, this may not be the case in the future. Future increases in the price of silicon or other materials and components could result in an increase in costs to us, price increases to our customers or reduced margins.

Other international trade conditions such as work slowdowns and labor strikes at port facilities or major weather events can also adversely impact the availability and price of solar photovoltaic modules.

Our business prospects could be harmed if solar energy is not widely adopted or sufficient demand for solar energy systems does not develop or takes longer to develop than we anticipate.

The solar energy market is at a relatively early stage of development. The extent to which solar energy will be widely adopted and the extent to which demand for solar energy systems will increase are uncertain. If solar energy does not achieve widespread adoption or demand for solar energy systems fails to develop sufficiently, we may be unable to achieve our revenue and profit targets. In addition, demand for solar energy systems in our targeted markets may not develop or may develop to a lesser extent or more slowly than we anticipate. Many factors may affect the demand for solar energy systems, including the following:

- availability of government and utility company subsidies and incentives to support the development of the solar energy industry;
- government and utility policies regarding the interconnection of solar energy systems to the utility grid;
- fluctuations in economic and market conditions that affect the viability of conventional and non-solar renewable energy sources, such as changes in the price of natural gas and other fossil fuels;
- cost-effectiveness (including the cost of solar panels), performance and reliability of solar energy systems compared with conventional and other non-solar renewable energy sources and products;
- success of other renewable energy generation technologies, such as hydroelectric, wind, geothermal, solar thermal, concentrated solar and biomass;
- availability of customer financing with economically attractive terms;
- fluctuations in expenditures by purchasers of solar energy systems, which tend to decrease in slower economic environments and periods of rising interest rates and tighter credit; and
- deregulation of the electric power industry and the broader energy industry.

A drop in the retail price of conventional electricity or non-solar renewable energy sources may negatively impact our business.

The demand for our solar energy systems depends in part on the price of conventional electricity, which affects return on investment resulting from the purchase of solar energy systems. Fluctuations in economic and market conditions that impact the prices of conventional and non-solar renewable energy sources could cause the demand for solar energy systems to decline, which would have a negative impact on our business.

Our sales and installations are subject to seasonality of customer demand and weather conditions which are outside of our control.

Our sales are subject to the seasonality of when customers buy solar energy systems. We historically have experienced spikes in orders during the spring and summer months which, due to lead time, result in installations and revenue increasing during the summer and fall. Tax incentives can generate additional backlog prior to the end of the year, depending upon the incentives available and whether customers are looking to take advantage of such incentives before the end of the year.

Our ability to construct systems outdoors may be impacted by inclement weather, which can be most prominent in our geographic installation regions during the first and fourth quarters of the year. As a result of these factors, our first quarter is generally our slowest quarter of the year. If unexpected natural events occur and we are unable to manage our cash flow through these seasonal factors, there could be a negative impact on our financial position, liquidity, results of operations and cash flow.

Our inability to respond to changing technologies and issues presented by new technologies could harm our business.

The solar energy industry is subject to technological change. If we rely on products and technologies that cease to be attractive to customers, or if we are unable to respond appropriately to changing technologies and changes in product function or quality, we may not be successful in capturing or retaining significant market share. In addition, any new technologies utilized in our solar energy systems may not perform as expected or as desired, in which event our adoption of such products or technologies may harm our business.

We may be unable to successfully commercialize POWERHOUSE™ 3.0, which may negatively impact our business and results of operation.

There are risks we must address to successfully commercialize POWERHOUSE™ 3.0:

- The adequacy of, and access to, capital necessary to commercialize POWERHOUSE™ 3.0;
- Our ability to satisfy the conditions and our obligations under the License;
- Our ability to grow a nationwide network of local roofers and solar installers to purchase POWERHOUSE™ solar shingles;
- Our ability to contract with homebuilders to purchase POWERHOUSE™ solar shingles for their communities;
- Our ability to manage a supply chain, including the cost and availability of raw materials, in order to achieve production levels and competitive pricing of the POWERHOUSE™ 3.0 shingles;
- Our ability to successfully expand operations and realize profitable revenue growth from the sale and installation of POWERHOUSE™ 3.0;
- Our ability to successfully and timely expand our POWERHOUSE™ 3.0 business outside of the United States and manage foreign exchange risks associated with the POWERHOUSE™ 3.0 business;
- Intellectual property infringement claims, and warranty claims related to the POWERHOUSE™ 3.0 business; and
- Competition in the built-in photovoltaic solar system business.

Our License with Dow for the exclusive use of the POWERHOUSE™ trademark name is subject to our selling of 50 megawatts of POWERHOUSE™ 3.0 in-roof shingle within the first 5 years and failure to do so could adversely affect our business, financial condition and results of operation.

If we do not sell 50 megawatts of POWERHOUSE™ 3.0 in-roof shingles during the first 5 years after obtaining UL certification, Dow has the right to amend the License to be non-exclusive. If that were to happen, Dow would be allowed to grant rights to others to sell POWERHOUSE™ 3.0 in-roof solar shingles and use associated intellectual property, thereby increasing competition, which could adversely affect our business, financial condition and results of operation.

Our Solar Division operates in a highly competitive market with low barriers to entry and, accordingly, we may face the loss of business or reduced margins.

The solar energy system installation market is highly competitive with low barriers to entry. We currently compete with significantly larger companies as well as a large number of relatively small installers and developers. Larger companies may have greater financial, technical and marketing resources and greater name recognition than we do. Smaller companies may lack adequate systems and capital but can benefit from operating efficiencies or from having lower overhead, which enables them to offer lower prices.

We believe that our Solar Division's ability to compete depends in part on a number of factors outside of our control, including the following:

- the availability of solar financing solutions;
- the price at which competitors offer comparable products;
- marketing efforts undertaken by our competitors;
- the extent of our competitors' responsiveness to customer needs; and
- access to materials, labor and installation services.

Competition in the solar energy system installation market may increase in the future as a result of low barriers to entry. Increased industry competition could result in reductions in price, margins, and market share and in greater competition for qualified personnel. Our business and operating results would be adversely affected if we are unable to compete effectively.

We derive the majority of the revenue from the sale of solar energy systems in east coast states.

We currently derive the vast majority of our Solar Division revenue from the sale of solar energy systems in east coast states. This geographic concentration exposes us to increased risks associated with the growth rates, government regulations, economic conditions, weather and other factors that may be specific to those states to which we would be less subject if we were more geographically diversified. We intend to expand our Solar Division into new states of operation. Any geographic expansion efforts that we may make may not be successful, which would limit our growth opportunities.

Our Board of Directors has concluded that we will exit our mainland residential business and we may not generate the cost savings we expect.

On March 27, 2019, our Board of Directors determined to exit our mainland residential solar business to focus on the POWERHOUSE™ in-roof shingle market and reduce overall cash outflow. This realignment is expected to result in the reduction of workforce payroll plus burden of approximately \$4.0 million annually. Revenues and net loss in 2018 for the mainland residential solar business were approximately \$8.9 million and \$6.3 million, respectively. In order for us to convert our existing backlog to revenue, we plan to use authorized integrators to complete installations throughout the remainder of 2019. These projected cost savings may not be attained, and we may not be successful at converting our existing backlog into revenue utilizing authorized integrators.

Our Solar Division installs solar energy systems, and many factors can prevent us from completing installations on time or on budget.

Factors that may prevent us from completing installations on time or on budget include:

- shortages of materials;
- shortages of skilled labor;
- unforeseen installation scheduling, engineering, excavation, environmental or geological problems;
- job site issues that were not apparent during site inspection;
- natural disasters, hurricanes, weather interference, fires, earthquakes or other casualty losses or delays;
- delays in obtaining or inability to obtain or maintain necessary licenses or permits;
- changes to plans or specifications;
- performance by subcontractors;
- disputes with subcontractors; and
- unanticipated cost increases in materials, labor or other elements of our projects beyond budgets and allowances for contingencies.

Our installation projects expose us to risks of cost overruns due to typical uncertainties associated with any project or changes in the designs, plans or concepts of such projects. For these and other reasons, installation costs may exceed the estimated cost of completions.

Availability and cost of financing for solar energy systems could reduce demand for our services and products.

Many of our Solar Division customers, and prospective customers of our POWERHOUSE™ roofers and homebuilders, depend on loan financing to fund the purchase price of our solar energy systems. The interest rate for this financing varies with market conditions. Third-party financing sources may also charge significant fees for their financing products. If financing sources increase their fees or interest rates, the cost of purchasing our solar energy systems will increase and we may experience decreased demand for our products and services, resulting in reduced revenue. In the alternative, if we elect to absorb any financing price increase by lowering the price of our products and services to keep the total cost to our customers constant, our revenue will decrease, and we will experience lower profit margins. However, we continue to rely on third parties to finance most of our sales of solar energy systems in our Solar Division and we expect that prospective customers of our POWERHOUSE™ roofers similarly will rely on third parties to finance their purchases.

An increase in interest rates or tight credit markets could make it difficult for customers to finance the cost of solar energy systems and could reduce demand for our services and products.

Some of our prospective customers may depend on debt financing, such as home equity loans or leasing, to fund the purchase of a solar energy system. Third-party financing sources, specifically for solar energy systems, are currently limited. The lack of financing sources, limitations on available credit, or an increase in interest rates could make it difficult or too costly for our potential customers to secure the financing necessary to purchase a solar energy system on favorable terms, or at all, thus lowering demand for our services and products and negatively impacting our business.

We may incur fines and other penalties if we do not conduct our business in accordance with licenses required for our operations and if any such license is suspended or lost, we may be unable to sell or install solar energy systems in the jurisdiction in question and our sales and revenue from that jurisdiction would be adversely affected.

As a construction company, we are required to hold general or specialty contractors' licenses in some of the jurisdictions in which we operate, although in other jurisdictions we are permitted to utilize the licenses of subcontractors. Some jurisdictions also require licenses to sell home improvement products or services, or to issue consumer credit. If we violate the rules of these licensing authorities, we may incur fines or other penalties or have our licenses suspended or cancelled. Some licenses require us to employ personnel with specific qualifications. If we lose those personnel, we may lose our ability to conduct business in that jurisdiction until we can hire a qualified replacement.

We may be subject to unexpected warranty expenses or service claims that could reduce our profits.

Our currently standard manufacturing warranty for our POWERHOUSE™ 3.0 solar shingles comes with an 11-year product warranty, which is the standard product warranty of most traditional solar panels today, and a 24-year power production warranty.

Our Solar Division provides warranties for workmanship and, in certain cases, in energy production and, accordingly we bear the risk of warranty claims long after we have completed the installation of a solar energy system. Our current standard warranty for our installation services includes a warranty period of up to 10 years for defective workmanship. In addition, most manufacturers of solar photovoltaic modules offer a 25-year warranty period for declines in power performance.

Although we maintain an estimated liability for potential warranty or service claims, claims in excess of our recorded liability could adversely affect our operating results. Our failure to predict accurately future warranty claims could result in unexpected volatility in our financial results.

We rely heavily on a limited number of suppliers, installers and other vendors, and if these companies were unable to deliver critical components and services, it would adversely affect our ability to operate and our financial results.

We rely on a limited number of third-party suppliers to provide the components used in our POWERHOUSE™ in-roof solar shingles and our solar energy systems. We also rely on key vendors to provide internal and external services which are critical to our operations, including installation of solar energy systems, accounting and customer relationship management software, facilities and communications. The failure of our suppliers and vendors to supply us with products and services in a timely manner or on commercially reasonable terms could result in lost orders, delay our project schedules, limit our ability to operate and harm our financial results. If any of our suppliers or vendors were to fail to supply our needs on a timely basis or to cease providing us key components or services we use, we would be required to secure alternative sources of supply. We may have difficulty securing alternative sources of supply. If this were to occur, our business would be harmed.

The installation and ongoing operation of solar energy systems involves significant safety risks.

Solar energy systems generate electricity, which is inherently dangerous. Installation of these systems also involves the risk of falling from rooftops, personal injuries occurring at the job site and other risks typical of construction projects. Although we take many steps to assure the safe installation and operation of our solar energy systems, and maintain insurance against such liabilities, we may nevertheless be exposed to significant losses arising from personal injuries or property damage arising from our projects.

Our failure to meet customer expectations in the performance of our services, and the risks and liabilities associated with placing our employees and technicians in our customers' homes and businesses, could give rise to claims against us.

Our failure or inability to meet customer expectations in the performance of our services could damage our reputation or result in claims against us. In addition, we are subject to various risks and liabilities associated with our employees and technicians providing installation services in the homes and businesses of our customers, including possible claims of errors and omissions, harassment, theft of customer property, criminal activity and other claims.

Product liability claims against us could result in adverse publicity and potentially significant monetary damages.

As a seller of consumer products, we may face product liability claims in the event that use of our solar energy systems results in injuries. Because solar energy systems produce electricity, it is possible that our products could result in injury, whether by product malfunctions, defects, improper installation or other causes. If such injuries or claims of injuries were to occur, we could incur monetary damages and our business could be adversely affected by any resulting negative publicity. The successful assertion of product liability claims against us also could result in potentially significant monetary damages and, if our insurance protection is inadequate to cover these claims, could require us to make significant payments from our own resources.

Our operations are largely dependent on the skill and experience of our management and key personnel. The loss of management and other key personnel or our inability to hire additional personnel could significantly harm our business and our ability to expand, and we may not be able to effectively replace members of management who have left the company.

Our continued success and our ability to maintain our competitive position is largely dependent upon, among other things, the efforts and skills of our senior executives and management team. We cannot guarantee that these individuals will remain with us. Further, we do not carry key man life insurance on our executives. If we lose the services of any members of our management team or other key personnel, our business may be significantly impaired. In addition, we cannot assure you that we will be able to attract additional qualified senior executive, management and key personnel.

The loss of personnel or failure to hire additional personnel could materially and adversely affect our business, operating results and our ability to expand.

The expansion of our business could significantly strain our managerial, financial and personnel resources. To reach our goals, we must successfully recruit, train, motivate and retain additional employees, including management and technical personnel, integrate new employees into our overall operations and enhance our financial and accounting systems, controls and reporting systems. While we believe we have personnel sufficient for the current requirements of our business, expansion of our business could require us to employ additional personnel. The loss of personnel or our failure to hire additional personnel could materially and adversely affect our business, operating results and our ability to expand.

From time to time, we are subject to litigation which, if adversely determined, could cause us to incur substantial losses.

From time to time during the normal course of operating our businesses, we are subject to various litigation claims and legal disputes. As a result, we might also be required to incur significant legal fees, which may have a material adverse effect on our financial position. In addition, because we cannot accurately predict the outcome of any action, it is possible that, as a result of current and/or future litigation, we will be subject to adverse judgments or settlements that could significantly reduce our earnings or result in losses.

Increased information technology security threats and more sophisticated computer crime pose a risk to our systems, networks, products and services.

We rely on technology, computer systems, third-party service providers, and our website for obtaining and storing certain information. Our business requires us to receive, retain and transmit personally identifiable information and other information about our customers, suppliers and employees, some of which is entrusted to third-party service providers and other businesses we interact with. Information technology security threats are increasing in frequency and sophistication. Our security measures have been breached in an immaterial manner in the past and may be breached in the future due to a cyber-attack, computer malware or viruses, employee error, malfeasance, fraudulent inducement (including so-called “social engineering” attacks and “phishing” scams) or other acts. Costs associated with our past security breach have not been significant. Unauthorized parties have previously obtained and may in the future obtain access to our data or the data of our customers, suppliers or employees or may otherwise cause damage or interfere with our technology, computer systems or website. We develop and update processes and maintain systems in an effort to try to prevent this from occurring and seek assurances from businesses we interact with that they will do the same, but the development and maintenance of these processes and systems are costly and require ongoing monitoring and updating as technologies change, privacy and information security regulations change, and efforts to overcome security measures become more sophisticated. We have taken, and continue to undertake significant steps to protect such information and seek assurances from businesses we interact with that they will do the same, but there can be no assurance that our data security systems or those of businesses we interact with will not be compromised, and such compromise could result in such information being obtained by unauthorized persons, adverse operational effects or interruptions, substantial additional costs or being subject to legal or regulatory proceedings, any of which could damage our reputation in the marketplace or materially and adversely affect our business, financial condition, operating results and cash flows.

While we are exploring and evaluating strategic alternatives, we may not be successful in identifying or completing any strategic alternative and any such strategic alternative may not yield additional value for shareholders.

On March 7, 2019, we announced that we had commenced a review of strategic alternatives which could result in, among other things, the possible sale of the Company. Our exploration of strategic alternatives may not result in the identification or consummation of any transaction. In addition, we may incur substantial expenses associated with identifying and evaluating potential strategic alternatives. The process of exploring strategic alternatives may be time consuming and disruptive to our business operations, and if we are unable to effectively manage the process, our business, financial condition and results of operations could be adversely affected. Any potential transaction and the related valuation would be dependent upon a number of factors that may be beyond our control, including, among other factors, market conditions, industry trends, the interest of third parties in our business and the availability of financing to potential buyers on reasonable terms.

Risk Factors Related to Our Securities

The market price of our Common Stock has been volatile, and future volatility could result in substantial losses for investors.

The market price of our Common Stock has been volatile in the past and could fluctuate widely in response to various factors, many of which are beyond our control, including the following:

- actual or anticipated changes in our operating results;
- regulatory, legislative or other developments affecting us or the solar energy industry generally;
- changes in expectations relating to our services and products, plans and strategic position or those of our competitors or customers;
- market conditions and trends within the solar energy industry;
- acquisitions or strategic alliances by us or by our competitors;
- litigation involving us, our industry or both;
- introductions of new technological innovations, services, products or pricing policies by us or by our competitors;
- recruitment or departure of key personnel;
- our ability to execute our business plan;
- volume and timing of customer orders;
- price and volume fluctuations in the overall stock market from time to time;
- changes in investor perception;
- the level and quality of any research analyst coverage of our Common Stock;
- changes in earnings estimates or investment recommendations by analysts;
- the financial guidance we may provide to the public, any changes in such guidance or its failure to meet such guidance;
- the trading volume of our Common Stock;

- short-term investment in our Common Stock by investors;
- our issuance of additional Common Stock or securities convertible into or exercisable for Common Stock; and
- economic and other external factors that impact purchasing decisions of our potential customers.

Future volatility of the market price of our Common Stock could result in substantial losses for investors.

Future issuances of stock, options, warrants or other securities will cause substantial dilution and may negatively affect the market price of our Common Stock.

Ownership of our securities may be diluted by future issuances of securities or the conversion or exercise of outstanding or to be issued options, warrants, convertible notes, convertible stock or other securities.

As of April 12, 2019, there were an aggregate of approximately 29 million shares of our Common Stock issuable upon exercise of outstanding warrants. The exercise price under certain of our outstanding warrants is subject to adjustment in the future.

Derivative securities, such as convertible debt, options and warrants, currently outstanding or issued in the future may contain anti-dilution protection provisions, which, if triggered, could require us to issue a larger number of the security underlying such derivative security than the face amount.

We cannot predict the effect, if any, that future sales or issuance of shares of our Common Stock into the market, or the availability of shares of our Common Stock for future sale, will have on the market price of our Common Stock. Sales of substantial amounts of our Common Stock (including shares issued upon exercise of options and warrants or conversion of convertible related party debt), or the perception that such sales could occur, may materially affect prevailing market prices for our Common Stock.

Our common stock could become subject to the Securities and Exchange Commission's "penny stock" regulations, which may limit the liquidity of Common Stock held by our shareholders.

The SEC has adopted regulations which generally define a "penny stock" to be an equity security that has a market price of less than \$5.00 per share, subject to specific exemptions. Based on our Common Stock's trading price below \$5.00 per share, if we are unable in the future to continue to satisfy an available exemption from the definition of "penny stock", then our Common Stock would be considered a penny stock for purposes of federal securities laws. Penny stock is subject to regulations, which affect the ability of broker-dealers to sell such securities. Broker-dealers who recommend a penny stock to persons (other than established customers and accredited investors) must make a special written suitability determination and receive the purchaser's written agreement to a transaction prior to sale.

If penny stock regulations apply to our Common Stock, it may be difficult to trade the stock because compliance with the regulations can delay and/or preclude certain trading transactions. Broker-dealers could be discouraged from effecting transactions in our Common Stock if penny stock regulations apply because of the sales practice and disclosure requirements. This could adversely affect the liquidity or price of our Common Stock and impede the sale of the Common Stock in the secondary market.

We do not expect to pay any cash dividends on our Common Stock for the foreseeable future.

We do not anticipate paying any cash dividends on our Common Stock for the foreseeable future.

Our business is subject to reporting requirements that continue to evolve and change, which could continue to require significant compliance effort and resources.

Because our Common Stock is publicly traded, we are subject to certain rules and regulations of federal, state and financial market exchange entities charged with the protection of investors and the oversight of companies whose securities are publicly traded. These entities, including the Public Company Accounting Oversight Board and the SEC, periodically issue new requirements and regulations and legislative bodies also review and revise applicable laws such as the Sarbanes-Oxley Act of 2002 and the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010. As interpretation and implementation of these laws and rules and promulgation of new regulations continues, we will continue to be required to commit significant financial and managerial resources and incur additional expenses.

Provisions in our articles of incorporation and bylaws might discourage, delay or prevent a change of control of our company or change in our management and, therefore, depress the trading price of our Common Stock.

Our articles of incorporation and bylaws contain provisions that could depress the trading price of our Common Stock by discouraging, delaying or preventing a change of control of our company or changes in our management that our shareholders may believe advantageous. These provisions include:

- Our Board of Directors may consist of any number of directors, which may be fixed from time to time by our Board of Directors. Newly created directorships resulting from any increase in our authorized number of directors may be filled by the affirmative vote of a majority of the directors then in office or by an election at an annual meeting or special meeting of shareholders called for that purpose, and any vacancies on its Board of Directors resulting from death, resignation, retirement, disqualification, removal from office or other cause may be filled by the affirmative vote of a majority of the remaining Board of Directors, even if less than a quorum is remaining in office.
- A shareholder must provide advance notice of any proposal to be brought before an annual meeting of shareholders by a shareholder, including any nomination for election of directors by any shareholder entitled to vote for the election of directors at the meeting.
- No shareholder proposal may be considered at a meeting of our shareholders unless the proposal relates to a matter on which a shareholder vote is required by our articles of incorporation, bylaws or by applicable law.
- Our Board of Directors has the power to issue preferred stock with designations, preferences, limitations and relative rights determined by our Board of Directors without any vote or action by shareholders. The issuance of preferred stock or of rights to purchase preferred stock could have the effect of making it more difficult for a third party to acquire our company, or of discouraging a third party from attempting to acquire our company.
- Our Board of Directors may amend, supplement or repeal our bylaws or adopt new bylaws, subject to repeal or change by action of our shareholders.

DESCRIPTION OF THE TRANSACTION

Registered Offering (Shelf Warrants)

April 2019 Offering (Series R Warrants and Series S Warrants)

In connection with the April 2019 Offering, the Company issued the Series R Warrants and Series S Warrants, as described above.

Private Placements (Private Warrants)

July 2014 Offering (July 2014 Warrants)

On July 9, 2014, the Company closed a private placement of units consisting of an aggregate of 244 shares of Common Stock and WP14 warrants to purchase an aggregate of up to 110 shares of Common Stock (the “July 2014 Warrants”) pursuant to the terms of the Securities Purchase Agreement dated July 2, 2014. The current holders of the July 2014 Warrants are listed in the selling shareholder table included in the section entitled “SELLING SHAREHOLDERS.”

February 2015 Offering (February 2015 PA Warrants)

On February 26 and February 27, 2015, the Company closed a registered offering of units (the “February 2015 Offering”). In connection with the February 2015 Offering, on February 27, 2015, in a private placement, the Company sold and issued to the placement agent, WestPark Capital, Inc. (“WestPark”), for an aggregate purchase price of \$100, the WPA warrant to purchase 49 shares of Common Stock (the “February 2015 PA Warrants”) pursuant to the terms of the Placement Agent Agreement between the Company and WestPark. The current holders of the February 2015 PA Warrants are listed in the selling shareholder table included in the section entitled “SELLING SHAREHOLDERS.”

June 2015 Offering (June 2015 PA Warrants)

On June 30, and July 1, 2015, the Company closed a registered offering of units (the “June 2015 Offering”). In connection with the June 2015 Offering, on July 1, 2015, in a private placement, the Company sold and issued to the placement agent, WestPark, for an aggregate purchase price of \$100, the WPA2 warrants to purchase 186 shares of Common Stock (the “June 2015 PA Warrants”) pursuant to the terms of the Placement Agency Agreement between the Company and WestPark. The current holders of such warrants are listed in the selling shareholder table included in the section entitled “SELLING SHAREHOLDERS.”

April 2016 Offering (Series G Warrants and April 2016 PA Warrants)

On April 1, 2016, the Company closed a private placement of \$10.0 million Senior Secured Convertible Notes due on April 1, 2019 (the “2016 Notes”) and Series G Warrants to purchase 8,300 shares of Common Stock (the “April 2016 Offering”). In connection with the April 2016 Offering, on April 1, 2016, the Company sold and issued to the placement agent, Roth Capital Partners, LLC (“Roth”), for an aggregate purchase price of \$100, the WPA3 warrants to purchase 1,411 shares of Common Stock (the “April 2016 PA Warrants”) pursuant to the terms of the engagement letter between the Company and Roth. The current holders of the Series G Warrants and April 2016 PA Warrants are listed in the selling shareholder table included in the section entitled “SELLING SHAREHOLDERS.”

December 2016 Offering (December 2016 PA Warrants)

On December 13, 2016, the Company closed a registered offering of units (the “December 2016 Offering”). In connection with the closing, the Company issued to the placement agent, Roth, the WPA5 warrants to purchase 30,834 shares of Common Stock (the “December 2016 PA Warrants”) pursuant to the terms of the Placement Agency Agreement between the Company and Roth. The current holders of the December 2016 PA Warrants are listed in the selling shareholder table included in the section entitled “SELLING SHAREHOLDERS.”

February 2017 Offerings (February 6, 2017 and February 9, 2017 PA Warrants)

On February 6, 2017, the Company closed a registered offering of units. In connection with the closing, the Company issued to the placement agent, Roth, WPA6 warrants to purchase 185,000 shares of Common Stock (the “February 6, 2017 PA Warrants”), pursuant to the terms of the Placement Agency Agreement between the Company and the placement agent. The current holders of the February 6, 2017 PA Warrants are listed in the selling shareholder table included in the section entitled “SELLING SHAREHOLDERS.”

On February 9, 2017, the Company closed a registered offering of units. In connection with the closing, the Company issued to the placement agent, Roth, WPA7 warrants to purchase 120,000 shares of Common Stock (the “February 9, 2017 PA Warrants”), pursuant to the terms of the Placement Agency Agreement between the Company and the placement agent. The current holders of the February 9, 2017 PA Warrants are listed in the selling shareholder table included in the section entitled “SELLING SHAREHOLDERS.”

January 2018 Offering (Series O Warrant and January 2018 PA Warrants)

On January 4, 2018, the Company issued and sold a Series O Warrant to purchase 1,600,000 shares of Common Stock to one institutional and accredited investor pursuant to the terms of the Securities Purchase Agreement, dated as of January 2, 2018, between the Company and the investor in a private placement in connection with a concurrent registered sales of shares of Common Stock and Series P Warrants to the investor (collectively, the “January 2018 Offering”). The current holder of the Series O Warrant is listed in the selling shareholder table included in the section entitled “SELLING SHAREHOLDERS.”

On January 4, 2018, in connection with the January 2018 Offering the Company sold and issued to the placement agent, WestPark, for an aggregate purchase price of \$100, WPA8 warrants to purchase 128,000 shares of Common Stock (the “January 2018 PA Warrants”) pursuant to the terms of the engagement letter between the Company and WestPark. The current holders of the January 2018 PA Warrants are listed in the selling shareholder table included in the section entitled “SELLING SHAREHOLDERS.”

April 2018 Offering (Series Q Warrants and April 2018 PA Warrants)

On April 9, 2018, the Company issued and sold (the “April 2018 Offering”) convertible notes and warrants to two institutional and accredited investors: (i) \$10.75 million in principal amount and \$10 million funding amount (reflecting an original issue discount of \$750,000) of convertible notes due April 9, 2019, consisting of (a) two Series A Senior Convertible Notes in the aggregate principal amount of \$5,750,000 (the “Series A Notes”) in consideration for aggregate cash payments of \$5,000,000, (b) two Series B Senior Secured Convertible Notes in the aggregate principal amount of \$5,000,000 (the “Series B Notes,” and collectively with the Series A Notes, the “2018 Notes”) for consideration consisting of two secured promissory notes, each issued and payable by an investor, in the aggregate principal amount of \$5,000,000, and (ii) Series Q Warrants to purchase up to 9,126,984 shares of the Company’s Common Stock under the terms of the Securities Purchase Agreement, dated March 30, 2018, as amended, among the Company and the investors. The Company received net proceeds of approximately \$4.4 million at the closing, after deducting commissions to the placement agent, WestPark, and estimated offering expenses payable by the Company associated with the private placement. The current holders of the Series Q Warrants are listed in the selling shareholder table included in the section entitled “SELLING SHAREHOLDERS.”

On April 9, 2018, in connection with the April 2018 Offering, the Company sold and issued to the placement agent, WestPark, for an aggregate purchase price of \$100, WPA9 warrants to purchase 730,159 shares of Common Stock (the “April 2018 PA Warrants”) pursuant to the terms of the engagement letter between the Company and the placement agent. The current holders of the April 2018 PA Warrants are listed in the selling shareholder table included in the section entitled “SELLING SHAREHOLDERS.”

April 2019 Offering (April 2019 PA Warrants)

On April 2, 2019, in connection with the April 2019 Offering, the Company sold and issued to the placement agent, Dawson James Securities, Inc. (“Dawson James”), for an aggregate purchase price of \$100, WPA10 warrants to purchase 1,389,474 shares of Common Stock (the “April 2019 PA Warrants”) pursuant to the terms of the engagement letter between the Company and Dawson James. The current holders of the April 2019 PA Warrants are listed in the selling shareholder table included in the section entitled “SELLING SHAREHOLDERS.”

Description of the Warrants

Subject to applicable laws, the Warrants may be offered for sale, sold, transferred or assigned without our consent. However, there is no established public trading market for the Warrants and Real Goods Solar does not expect one to develop.

The below descriptions of the terms of the Warrants are qualified in their entirety by the forms of Warrants included as Exhibits 4.6, 4.10, 4.13, 4.15, 4.16, 4.23, 4.26, 4.29, 4.30, 4.32, 4.35, 4.37, 4.38, 4.39 and 4.40 to this prospectus.

The table below indicates the current exercise price, the number of shares of Common Stock under, the issuance date and the expiration date of each Warrant.

Warrant	Current Exercise Price	Number of Shares	Issuance Date	Expiration Date
July 2014 Warrants	\$ 38,280	84	July 9, 2014	January 9, 2020
February 2015 PA Warrants	\$ 6,000	49	February 27, 2015	February 22, 2020
June 2015 PA Warrants	\$ 744	186	June 30, 2015	June 26, 2020
Series G Warrants	\$ 1.36	3,322	April 1, 2016	October 1, 2021
April 2016 PA Warrants	\$ 496.80	1,411	April 1, 2016	March 1, 2021
December 2016 PA Warrants	\$ 10.50	30,834	December 13, 2016	December 8, 2021
February 6, 2017 PA Warrants	\$ 3.88	185,500	February 6, 2017	February 1, 2022
February 9, 2017 PA Warrants	\$ 3.13	120,000	February 9, 2017	February 7, 2022
Series O Warrant	\$ 1.47	1,600,000	January 4, 2018	July 4, 2023
January 2018 PA Warrants	\$ 1.47	128,000	January 4, 2018	July 4, 2023
Series Q Warrants	\$ 0.19	317,678	April 9, 2018	April 9, 2023
April 2018 PA Warrants	\$ 0.19	730,160	April 9, 2018	April 9, 2023
Series R Warrants	\$ 0.20	17,368,421	April 2, 2019	April 2, 2024
Series S Warrants	\$ 0.01	1,430,141	April 2, 2019	April 2, 2024
April 2019 PA Warrants	\$ 0.25	1,389,474	April 2, 2019	April 2, 2024

Provisions for changes to or adjustments in the exercise price and other material terms of the Warrants are described below.

Series R Warrants and Series S Warrants

The exercise price of the Series R Warrants is subject to adjustments for stock splits or similar events, and if the Company in the future issue shares of Common Stock or securities exercisable for or convertible into shares of Common Stock at an effective price per share less than the exercise price then in effect, then the exercise price will be reduced to such lower effective price per share. In addition, the Company may, with the consent of the “required holders” (as defined in the Series R Warrants), reduce the then current exercise price to any amount and for any period of time deemed appropriate by the Company’s Board of Directors.

Under certain circumstances, the holders of the Series R Warrants may elect to exercise them through a cashless exercise, in which case the holders will receive upon such exercise the “net number” of shares of Common Stock determined according to the formula set forth in the Series R Warrants and the Company will not receive the exercise price. Further, on or after the 60th day following issuance, if the volume weighted price of the Common Stock for five consecutive trading days is less than the exercise price, the holder may thereafter, in its sole discretion and regardless of whether the shares of Common Stock issuable upon exercise of a Series R Warrant is not covered by a registration statement under the Securities Act, elect to exercise a Series R Warrant without payment of any exercise price and receive a number of shares of Common Stock equal to the product of (x) the aggregate number of shares that would be issuable upon exercise of a Series R Warrant if such exercise were by means of a cash exercise rather than a cashless exercise and (y) 0.50.

The holder may not exercise a Series R Warrant and the Company may not issue shares of Common Stock under a Series R Warrant if, after giving effect to the exercise or issuance, the holder together with its affiliates would beneficially own in excess of a set percentage of the outstanding shares of the Common Stock. The cap was initially set on the date of issuance at a percentage not in excess of 9.99%, at each holder’s election. At each holder’s option, the cap may be increased or decreased to any other percentage not in excess of 9.99%, except that any increase will not be effective until the 61st day after notice to us.

The holders of the Series R Warrants are entitled to acquire options, convertible securities or rights to purchase the Company's securities or property granted, issued or sold pro rata to the holders of its Common Stock on an "as if exercised for Common Stock" basis. The holders of the Series R Warrants are entitled to receive any dividend or other distribution of the Company's assets (or rights to acquire its assets), at any time after the issuance of the Series R Warrants, on an "as if exercised for Common Stock" basis.

The Series R Warrants prohibit the Company from entering into transactions constituting a "fundamental transaction" (as defined in the Series R Warrants) unless the successor entity assumes all of the Company's obligations under the Series R Warrants and the other transaction documents in a written agreement approved by the "required holders" of the Series R Warrants. Further, after a fundamental transaction, upon the request of a holder, the Company is required to purchase such holder's Series R Warrants for an amount equal to the "Black Scholes value" (as defined in the Series R Warrants) of the remaining unexercised portion of such Series R Warrants. The definition of "fundamental transactions" includes, but is not limited to, mergers, a sale of all or substantially all of the Company's assets, certain tender offers and other transactions that result in a change of control.

The terms of the Series S Warrants are substantially the same as the Series R Warrants, other than the exercise price is not subject to adjustment upon subsequent issuances of shares of Common Stock or securities exercisable for or convertible into shares of Common Stock, and holders may not require the Company to purchase the Series R Warrants for the "Black Scholes value."

July 2014 Warrants

The exercise price and number of shares of Common Stock issuable under the July 2014 Warrants are subject to anti-dilutive adjustments upon the occurrence of certain events, such as stock splits. The July 2014 Warrants contain provisions concerning the assumption of the July 2014 Warrants in connection with a Fundamental Transaction (as defined in the July 2014 Warrants), and mandatory and voluntary redemption of the July 2014 Warrants under certain circumstances. If at any time after the July 2014 Warrants are exercisable there is no effective registration statement on file with the SEC registering, or no current prospectus available for, the resale of the shares of our Common Stock issuable upon exercise of the July 2014 Warrants, the July 2014 Warrants may be exercised by means of a "cashless exercise."

Under the terms of the July 2014 Warrants, no selling shareholder may exercise its July 2014 Warrants if, after giving effect to such exercise and the issuance of the shares of Common Stock issued pursuant thereto, such selling shareholder, together with any of its affiliates, would beneficially own a number of shares of our Common Stock which would exceed 4.99% of the issued and outstanding Common Stock. However, a selling shareholder may increase or decrease this percentage to any other percentage not in excess of 9.99% effective no earlier than the 61st day after delivering written notice to us.

February 2015 PA Warrants

The exercise price of the February 2015 PA Warrants is subject to adjustments for stock splits and similar events. In addition, the Company may, with the consent of the "required holders" (as defined in the February 2015 PA Warrants), reduce the then current exercise price to any amount and for any period of time deemed appropriate by the Company's Board of Directors. A holder of a February 2015 PA Warrant may elect to exercise it through a cashless exercise at any time, regardless of whether the shares of Common Stock issuable upon exercise of the February 2015 PA Warrants are covered by a registration statement under the Securities Act, in which case the holder will receive upon such exercise the "net number" of shares of Common Stock determined according to the formula set forth in the February 2015 PA Warrants and the Company will not receive the exercise price.

A holder may not exercise a February 2015 PA Warrant and the Company may not issue shares of Common Stock under the February 2015 PA Warrant if, after giving effect to the exercise or issuance, the holder together with its affiliates would beneficially own in excess of 4.99% of the outstanding shares of Common Stock. At the holder's option, the cap may be increased or decreased to any other percentage not in excess of 9.99%, except that any increase will not be effective until the 61st day after notice to the Company.

The holders of the February 2015 PA Warrants are entitled to acquire options, convertible securities or rights to purchase the Company's securities or property granted, issued or sold pro rata to the holders of its Common Stock on an "as if exercised for Common Stock" basis. The holders of the February 2015 PA Warrants are entitled to receive any non-cash dividend or other distribution of the Company's assets (or rights to acquire its assets), at any time after the issuance of the February 2015 PA Warrants, on an "as if exercised for Common Stock" basis.

The February 2015 PA Warrants prohibit the Company from entering into transactions constituting a "fundamental transaction" (as defined in the February 2015 PA Warrants) unless the successor entity assumes all of the Company's obligations under the February 2015 PA Warrants in a written agreement approved by the "required holders" of the February 2015 PA Warrants. The definition of "fundamental transactions" includes, but is not limited to, mergers, a sale of all or substantially all of the Company's assets, certain tender offers and other transactions that result in a change of control.

Pursuant to FINRA rules, the February 2015 PA Warrants and the underlying securities are subject to certain restrictions on transfer.

June 2015 PA Warrants

The exercise price of the June 2015 PA Warrants is subject to adjustments for stock splits and similar events. In addition, the Company may, with the consent of the "required holders" (as defined in the February 2015 PA Warrants), reduce the then current exercise price to any amount and for any period of time deemed appropriate by the Company's Board of Directors. A holder of a June 2015 PA Warrant may elect to exercise it through a cashless exercise at any time, regardless of whether the shares of Common Stock issuable upon exercise of the June 2015 PA Warrant are covered by a registration statement under the Securities Act, in which case the holder will receive upon such exercise the "net number" of shares of Common Stock determined according to the formula set forth in the June 2015 PA Warrants and the Company will not receive the exercise price.

A holder may not exercise a June 2015 PA Warrant and the Company may not issue shares of Common Stock under the June 2015 PA Warrant if, after giving effect to the exercise or issuance, the holder together with its affiliates would beneficially own in excess of 4.99% of the outstanding shares of Common Stock. At the holder's option, the cap may be increased or decreased to any other percentage not in excess of 9.99%, except that any increase will not be effective until the 61st day after notice to the Company.

The holders of the June 2015 PA Warrants are entitled to acquire options, convertible securities or rights to purchase the Company's securities or property granted, issued or sold pro rata to the holders of its Common Stock on an "as if exercised for Common Stock" basis. The holders of the June 2015 PA Warrants are entitled to receive any non-cash dividend or other distribution of the Company's assets (or rights to acquire its assets), at any time after the issuance of the June 2015 PA Warrants, on an "as if exercised for Common Stock" basis.

The June 2015 PA Warrants prohibit the Company from entering into transactions constituting a "fundamental transaction" (as defined in the June 2015 PA Warrants) unless the successor entity assumes all of the Company's obligations under the June 2015 PA Warrants in a written agreement approved by the "required holders" of the June 2015 PA Warrants. The definition of "fundamental transactions" includes, but is not limited to, mergers, a sale of all or substantially all of the Company's assets, certain tender offers and other transactions that result in a change of control.

Pursuant to FINRA rules, the February 2015 PA Warrants and the underlying securities are subject to certain restrictions on transfer.

Series G Warrants and April 2016 PA Warrants

The exercise price of the Series G Warrants is subject to adjustments for stock splits and similar events. Under certain circumstances, the holders of the Series G Warrants may elect to exercise them through a cashless exercise, in which case the holders will receive upon such exercise the "net number" of shares of Common Stock determined according to the formula set forth in the Series G Warrants and the Company will not receive the exercise price.

A holder may not exercise any of the Series G Warrants, and the Company may not issue shares of Common Stock upon exercise of any of the Series G Warrants if, after giving effect to the exercise or issuance, the holder together with its "attribution parties," would beneficially own in excess of 9.99% of the outstanding shares of Common Stock. At each holder's option, the cap may be increased or decreased to any other percentage not in excess of 9.99%, except that any increase will not be effective until the 61st day after notice to the Company.

The holders of the Series G Warrants are entitled to receive any dividend or other distribution of the Company's assets (or rights to acquire its assets), at any time after the issuance of the Series G Warrants, on an "as if exercised for Common Stock" basis. The holders of the Series G Warrants are entitled to acquire options, convertible securities or rights to purchase the Company's securities or property granted, issued or sold pro rata to the holders of its Common Stock on an "as if exercised for Common Stock" basis. The Series G Warrants prohibit the Company from entering into transactions constituting a "fundamental transaction" (as defined in the Series G Warrants) unless the successor entity assumes all of the Company's obligations under the Series G Warrants and the other transaction documents in a written agreement approved by the "required holders" (as defined in the Series G Warrants) of the Series G Warrants. The definition of "fundamental transactions" includes, but is not limited to, mergers, a sale of all or substantially all our assets, certain tender offers and other transactions that result in a change of control.

The April 2016 PA Warrants have substantially the same terms as the Series G Warrants other than they (i) expire five years after the effective date of the private placement, and (ii) have cashless exercise rights regardless of whether an effective registration statement registering, or a current prospectus being available for, the resale of the shares of Common Stock underlying the April 2016 PA Warrants.

December 2016 PA Warrants

The exercise price of the December 2016 PA Warrant is subject to adjustments for stock splits and similar events. In addition, the Company may, with the consent of the "required holders" (as defined in the December 2016 PA Warrant), reduce the then current exercise price to any amount and for any period of time deemed appropriate by the Company's Board of Directors. The holder of the December 2016 PA Warrant may elect to exercise it through a cashless exercise at any time, regardless of whether the shares of Common Stock issuable upon exercise of the December 2016 PA Warrant are covered by a registration statement under the Securities Act (as defined below), in which case the holder will receive upon such exercise the "net number" of shares of Common Stock determined according to the formula set forth in the December 2016 PA Warrant and the Company will not receive the exercise price.

The holder may not exercise the December 2016 PA Warrant and the Company may not issue shares of Common Stock under the December 2016 PA Warrant if, after giving effect to the exercise or issuance, the holder together with its affiliates would beneficially own in excess of 4.99% of the outstanding shares of Common Stock. At the holder's option, the cap may be increased or decreased to any other percentage not in excess of 9.99%, except that any increase will not be effective until the 61st day after notice to the Company.

The holder of the December 2016 PA Warrant is entitled to acquire options, convertible securities or rights to purchase the Company's securities or property granted, issued or sold pro rata to the holders of its Common Stock on an "as if exercised for Common Stock" basis. The holder of the December 2016 PA Warrant is entitled to receive any non-cash dividend or other distribution of the Company's assets (or rights to acquire its assets), at any time after the issuance of the December 2016 PA Warrant, on an "as if exercised for Common Stock" basis.

The December 2016 PA Warrant prohibits the Company from entering into transactions constituting a "fundamental transaction" (as defined in the December 2016 PA Warrant) unless the successor entity assumes all of the Company's obligations under the December 2016 PA Warrant in a written agreement approved by the "required holders" of the December 2016 PA Warrant. The definition of "fundamental transactions" includes, but is not limited to, mergers, a sale of all or substantially all of the Company's assets, certain tender offers and other transactions that result in a change of control.

Pursuant to FINRA rules, the December 2016 PA Warrant and the underlying securities are subject to certain restrictions on transfer.

February 2017 PA Warrants

The terms of the February 2017 PA Warrants are substantially the same as the December 2016 PA Warrant.

Series O Warrant and January 2018 PA Warrants

The exercise price of the Series O Warrant is subject to adjustments for stock splits and similar events. Subject to applicable laws, the Series O Warrant may be offered for sale, sold, transferred or assigned without the Company's consent. If the resale of the shares of Common Stock issuable upon exercise of the Series O Warrant is not registered on an effective registration statement, the holder of the Series O Warrant may elect to exercise the Series O Warrant through a cashless exercise. Upon a cashless exercise, a holder will receive the "net number" of shares of Common Stock determined according to the formula set forth in the Series O Warrant and the Company will not receive the cash exercise price.

A holder may not exercise the Series O Warrant and the Company may not issue shares of Common Stock under the Series O Warrant if, after giving effect to the exercise or issuance, each holder together with its affiliates would beneficially own in excess of 9.95% of the outstanding shares of the Common Stock. At a holder's option, the cap may be increased or decreased to any other percentage not in excess of 9.99%, except that any increase will not be effective until the 61st day after notice to the Company.

The holder of the Series O Warrant is entitled to acquire options, convertible securities or rights to purchase the Company's securities or property granted, issued or sold pro rata to the holders of its Common Stock on an "as if exercised for Common Stock" basis. The holder of the Series O Warrant is entitled to receive any dividend or other distribution of the Company's assets (or rights to acquire its assets), at any time after the issuance of the Series O Warrant, on an "as if exercised for Common Stock" basis. The Series O Warrant prohibits the Company from entering into transactions constituting a "fundamental transaction" (as defined in the Series O Warrant) unless the successor entity assumes all of the Company's obligations under the Series O Warrant and the other transaction documents in a written agreement approved by the "required holders" of the Series O Warrant. The definition of "fundamental transactions" includes, but is not limited to, mergers, a sale of all or substantially all of the Company's assets, certain tender offers and other transactions that result in a change of control.

The terms of the January 2018 PA Warrants are substantially the same as the Series O Warrant other than that they (i) expire five years after the effective date of the offering; (b) are exercisable through a cashless exercise regardless of whether the shares of Common Stock issuable upon exercise of the January 2018 PA Warrant are covered by a registration statement under the Securities Act; and (iii) pursuant to FINRA rules, the January 2018 PA Warrants and the underlying securities are subject to certain restrictions on transfer.

Series Q Warrant and April 2018 PA Warrant

Holders of Series Q Warrants are entitled to use cashless exercise if after six months from issuance, at any time, there is no registration statement covering the resale of the shares of Common Stock issuable upon exercise of the Series Q Warrants.

The exercise price is subject to adjustments for stock splits, stock dividends, and similar events. In addition, the exercise price will be subject to reduction in the event of (i) a sale or deemed issuance or sale of shares of Common Stock or other securities convertible, exercisable or exchangeable for shares of Common Stock (other than Excluded Securities (as defined in the Series Q Warrants)) for consideration per share less than the exercise price of the Series Q Warrants will be reduced in accordance with formulas provided in the Series Q Warrants, (ii) a sale of Variable Price Securities (as defined in the Series Q Warrants), in which case the holder will have the right to substitute the exercise price for the Variable Price, (iii) if a stock split, stock dividend, stock combination recapitalization or other similar transaction involving the Common Stock and the Event Market Price (as defined in the Series Q Warrants) is less than the exercise price, in which case the exercise price shall be reduced to the Event Market Price, or (iv) at any time, with the prior written consent of the Required Holders (as defined in the Series Q Warrants), to reduce the exercise price.

A holder may not exercise any of the Series Q Warrants, and we may not issue shares of Common Stock upon exercise of any of the Series Q Warrants if, after giving effect to the exercise, a holder together with its “attribution parties,” would beneficially own in excess of a set percentage not in excess of 9.99%, as elected by each investor at closing, of the outstanding shares of our Common Stock. At each holder’s option, the cap may be increased or decrease to any other percentage not in excess of 9.99%, except that any increase will not be effective until the 61st day after notice to us.

The holders of the Series Q Warrants are entitled to receive any dividend or other distribution of our assets (or rights to acquire its assets) at any time after the issuance of the Series Q Warrants, on an “as if exercised for Common Stock” basis. The holders of the Series Q Warrants are entitled to acquire options, convertible securities or rights to purchase our securities or property granted, issued or sold pro rata to the holders of our Common Stock on an “as if exercised for Common Stock” basis.

The Series Q Warrants prohibit us from entering into transactions constituting a Fundamental Transaction (as defined in the Series Q Warrants) unless the successor entity assumes all of our obligations under the Series Q Warrants and the other transaction documents in a written agreement approved by the Required Holders (as defined in the Series Q Warrants). The definition of Fundamental Transactions includes, but is not limited to, mergers, a sale of all or substantially all of our assets, certain tender offers and other transactions that result in a change of control. Further, in connection with a Change of Control (as defined in the Series Q Warrants), upon request of a holder of a Series Q Warrant, we or the Successor Entity (as defined in the Series Q Warrants), as the case may be, shall exchange a Series Q Warrant for consideration equal to the Black Scholes Value (as defined in the Series Q Warrants) of such portion of such Series Q Warrant subject to exchange in the form of, at our election, either (i) rights convertible into the Corporate Event Consideration (as defined in the Series Q Warrants) applicable to the Change of Control (as defined in the Series Q Warrants) event, or (ii) cash. The definition of Change of Control is generally the same as the definition of Fundamental Transaction but excludes certain types of Fundamental Transactions.

Further, after the occurrence of an Event of Default (as defined in the 2018 Notes), at the request of a holder of a Series Q Warrant, we or the Successor Entity (as defined in the Series Q Warrants), as the case may be, shall purchase such holders Series Q Warrant for cash in an amount equal to the Event of Default Black Scholes Value (as defined in the Series Q Warrants).

The April 2018 PA Warrants have substantially the same terms as the Series Q Warrants other than that they (i) have a cashless exercise right regardless of whether an effective registration statement registering, or a current prospectus being available for, the resale of the shares of Common Stock issuable upon exercise of the April 2018 PA Warrants, and (ii) pursuant to FINRA rules, the April 2018 PA Warrants and the underlying securities are subject to certain restrictions on transfer.

April 2019 PA Warrants

The April 2019 PA Warrants have similar terms to the Series R Warrants other than that they (i) are exercisable through a cashless exercise regardless of whether the shares of Common Stock issuable upon exercise of the April 2019 PA Warrants are covered by a registration statement under the Securities Act but only based on the net number of shares; (ii) certain covenants appearing in the Series R Warrants were removed in the April 2019 PA Warrants; (iii) the initial beneficial ownership limitation was set at 4.99%; (iv) the April 2019 PA Warrants have certain demand and piggyback registration rights with respect to the shares issuable upon exercise of the April 2019 PA Warrants; and (v) pursuant to FINRA rules, the April 2019 PA Warrants and the underlying securities are subject to certain restrictions on transfer.

USE OF PROCEEDS

If all of the Series R Warrants and Series S Warrants are exercised for cash (assuming no exercise price adjustments), we estimate that the total net proceeds of such exercises, after deducting estimated expenses of this offering of approximately \$70,000, would be approximately \$3.4 million, which we will use (i) in connection with the commercialization of the POWERHOUSE™ product, and (ii) for general corporate purposes, including, without limitation, for working capital purposes, to increase sales and operational capabilities, but not for (i) the satisfaction of any portion of our debt (other than pursuant to trade payables in the ordinary course of our business and prior practices), (ii) the redemption of any Common Stock or security exercisable or convertible into Common Stock, (iii) for the settlement of any outstanding litigation, or (iv) in violation of regulation under the Foreign Corrupt Practices Act of 1977, as amended, or regulations by the Office of Foreign Assets Control of the U.S. Treasury Department.

This prospectus also relates to shares of Common Stock that may be offered and sold from time to time by certain selling shareholders. We will not receive any proceeds from the sale of the shares of Common Stock by the selling shareholders.

If all of the Private Warrants are exercised for cash (assuming no exercise price adjustments), we estimate that the total net proceeds of such exercises, after deducting estimated expenses of filing the registration statement of which this prospectus is a part of approximately \$70,000, would be approximately \$8.8 million, which we will use for general corporate purposes.

As of the date of this prospectus, we cannot specify with certainty all of the particular uses for the net proceeds we will have upon completion of the offering or the order of priority in which we may use such proceeds. Accordingly, we will retain broad discretion over the use of these proceeds.

If at any time after the Warrants are exercisable there is no effective registration statement on file with the SEC registering, or no current prospectus available for, the issuance or resale of the shares of our Common Stock issuable upon exercise of the Warrants, or under certain other circumstances, see the section entitled “*Description of Warrants*” beginning on page 36, the Warrants may be exercised by means of a “cashless exercise” and we will not receive any proceeds at such time.

The selling shareholders will pay all underwriting discounts, selling commissions and expenses incurred by them for brokerage, accounting, tax or legal services or any other expenses incurred by the selling shareholders in connection with the sale of the shares, if any. We will bear all other costs, fees and expenses incurred in effecting the registration of the shares covered by this prospectus, including, without limitation, all registration and filing fees, OTCQX fees and fees and expenses of our counsel and our accountants.

DILUTION

Dilution is the amount by which the exercise price paid by the holders of the Series R Warrants and the Series S Warrants to purchase the underlying shares of Common Stock offered under this prospectus will exceed the as-adjusted net tangible book value per share of Common Stock after such exercise.

Net tangible book value (deficit) per share of our Common Stock as of a particular date represents the amount of our total tangible assets less our total liabilities, divided by the number of shares of Common Stock outstanding as of such date. As of December 31, 2018, our net tangible book value (deficit) was approximately \$7.6 million, or \$0.08 per share of Common Stock based on there being 91,859,635 shares of our Common Stock outstanding as of December 31, 2018. Purchasers of our Common Stock upon exercise of the Series R Warrants will experience substantial and immediate dilution in net tangible book value per share of Common Stock for financial accounting purposes, as illustrated in the following tables. The tables below assume that all of the Series R Warrants and the Series S Warrants are exercised for cash and are based on there being 108,902,754 shares of Common Stock outstanding as of April 12, 2019.

Series R Warrants	
Exercise price per share	\$ 0.20
Net tangible book value per share as of December 31, 2018	\$ 0.08
Increase in pro forma net tangible book value from conversion of convertible notes into Common Stock between December 31, 2018 and April 9, 2019 and related to the April 9, 2019 offering	0.02
Increase in pro forma net tangible book value per share attributable to purchasers of Common Stock under Series S Warrants	\$ 0.02
Adjusted net tangible book value per share after giving effect to the purchase of Common Stock under the Series S Warrants	\$ 0.12
Dilution in net tangible book value per share to purchasers of Common Stock under Series S Warrants	\$ 0.08

Series S Warrants

Exercise price per share	\$	0.01
Net tangible book value per share as of December 31, 2018	\$	0.08
Increase in pro forma net tangible book value from conversion of convertible notes into Common Stock between December 31, 2018 and April 9, 2019 and related to the April 9, 2019 offering		0.02
Increase in pro forma net tangible book value per share attributable to purchasers of Common Stock under Series S Warrants	\$	0.00
Adjusted net tangible book value per share after giving effect to the purchase of Common Stock under the Series S Warrants	\$	0.10
(Increase) in net tangible book value per share to purchasers of Common Stock under Series S Warrants	\$	(0.09)

The tables above do not take into account any shares of Common Stock issuable in the future upon the exercise or conversion of currently outstanding derivative securities other than, in each case, the Warrant series covered by each table. We may in the future sell substantial additional amounts of Common Stock or securities convertible into or exercisable for Common Stock. We may also choose to raise additional capital due to market conditions or other strategic considerations even if we believe we have sufficient funds for our current or future operating plans. The issuance of these securities could result in further dilution to our shareholders.

SELLING SHAREHOLDERS

The shares of Common Stock being offered by the selling shareholders consist of shares of Common Stock issuable upon exercise of outstanding Private Warrants. Pursuant to agreements entered into with some of the selling shareholders, we are required to register for resale 135% of the number of shares of Common Stock issuable upon exercise of Series Q Warrants.

For additional information regarding the issuance of the Private Warrants, see “DESCRIPTION OF THE TRANSACTION” above. We are registering the shares of Common Stock in order to permit the selling shareholders to offer the shares for resale from time to time. Except for the ownership of the Private Warrants and other warrants or as described in the table below, the selling shareholders have not had any material relationship with us within the past three years.

The table below lists the selling shareholders and other information regarding the beneficial ownership (as determined under Section 13(d) of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), and the rules and regulations thereunder) of the shares of Common Stock held by each of the selling shareholders. The second column lists the number of shares of Common Stock beneficially owned by the selling shareholders, based on their respective ownership of shares of Common Stock and warrants, as of April 12, 2019, assuming exercise of the warrants held by each such selling shareholder on that date but taking account of any limitations on exercise set forth therein. The second column assumes that a selling shareholder first exercises warrants with a limitation on exercise of 4.99% or less before exercising any warrants with a limitation on exercise in excess of 4.99%.

The third column lists the shares of Common Stock being offered by this prospectus by the selling shareholders and does not take in account any limitations on exercise of the warrants set forth therein.

The fourth and fifth columns assume the sale of all of the shares offered by the selling shareholders pursuant to this prospectus.

Under the terms of the Private Warrants, a selling shareholder may not exercise the Private Warrants to the extent (but only to the extent) such selling shareholder or any of its affiliates would beneficially own a number of shares of our Common Stock which would exceed a specified percentage, not exceeding 9.99%, as elected by each selling shareholder, of our outstanding Common Stock. The number of shares in the second, fourth and fifth columns reflects these limitations.

The selling shareholders may sell all, some or none of their shares in this offering. See “*Plan of Distribution.*”

All of the Private Warrants are currently exercisable.

Name of Selling Shareholder	Number of Shares of Common Stock Owned Prior to Offering	Maximum Number of Shares of Common Stock to be Sold Pursuant to this Prospectus	Number of Shares of Common Stock Owned After Offering	Percentage of Shares of Common Stock Owned After Offering (to the extent greater than 1%)
Hudson Bay Master Fund Ltd. ⁽¹⁾	8,961,318 ⁽²⁾	1,738,100 ⁽³⁾	10,530,011 ⁽²⁾	8.92%
Intracoastal Capital, LLC ⁽⁴⁾	8,942,342 ⁽⁵⁾	8 ⁽⁶⁾	8,924,334 ⁽⁵⁾	8.21%
Alto Opportunity Fund, SPC – Segregated Master Portfolio B ⁽⁷⁾	5,436,322 ⁽⁸⁾	99,297 ⁽⁹⁾	5,439,462 ⁽⁸⁾	4.99%
Dawson James Securities Inc. ⁽¹⁰⁾	764,210 ⁽¹¹⁾	764,210	-	-
Jonathan Blum ⁽¹²⁾	539,125 ⁽¹³⁾	539,125	-	-
Brandon Ross ⁽¹⁴⁾	539,014 ⁽¹⁵⁾	539,014	-	-
Iroquois Master Fund Ltd. ⁽¹⁶⁾	533,110 ⁽¹⁷⁾	5 ⁽⁶⁾	533,105	*
WestPark Capital, Inc. ⁽¹⁸⁾	370,490 ⁽¹⁹⁾	370,490	-	-
Roth Capital Partners, LLC ⁽²⁰⁾	337,745 ⁽²¹⁾	337,745	-	-
Empery Asset Master Ltd ⁽²²⁾	299,786 ⁽¹⁷⁾	591 ⁽²³⁾	264,418	*
Empery Tax Efficient II, LP ⁽²⁴⁾	229,232 ⁽¹⁷⁾	215 ⁽²³⁾	205,694	*
Empery Tax Efficient, LP ⁽²⁵⁾	147,987 ⁽¹⁷⁾	439 ⁽²³⁾	129,889	*
Doug Kaiser ⁽²⁶⁾	17,510 ⁽²⁷⁾	17,510	-	-
Frank Salvatore ⁽²⁸⁾	17,510 ⁽²⁹⁾	17,510	-	-
683 Capital Partners, LP ⁽³⁰⁾	16 ⁽⁶⁾	16	-	-
Alder Capital Partners, LP ⁽³¹⁾	10 ⁽⁶⁾	10	-	-
Capital Ventures International ⁽³²⁾	9 ⁽⁶⁾	9	-	-
OTA, LLC ⁽³³⁾	9 ⁽⁶⁾	9	-	-
Julie Kamps ⁽³⁴⁾	9 ⁽³⁵⁾	9	-	-
Anson Investments Master Fund LP ⁽³⁶⁾	5 ⁽⁶⁾	5	-	-
BTG Investments, LLC ⁽³⁷⁾	5 ⁽⁶⁾	5	-	-
Palisade Long Short Alpha Master Fund (Cayman) Limited ⁽³⁸⁾	5 ⁽⁶⁾	5	-	-
Jason Stern ⁽³⁹⁾	1 ⁽⁴⁰⁾	1	-	-
Gordon Roth ⁽⁴¹⁾	1 ⁽⁶⁾	1	-	-
Jesse Pichel ⁽⁴²⁾	1 ⁽⁶⁾	1	-	-
John Chambers ⁽⁴³⁾	1 ⁽⁶⁾	1	-	-
John Weber ⁽⁴⁴⁾	1 ⁽⁶⁾	1	-	-
Michael Aaron Margolis ⁽⁴⁵⁾	1 ⁽⁶⁾	1	-	-

Michael Chill ⁽⁴⁶⁾	1(6)	1	-	-
Theodore Roth ⁽⁴⁷⁾	1(6)	1	-	-

* Denotes less than 1%.

(1) Hudson Bay Master Fund Ltd. - Hudson Bay Capital Management LP, the investment manager of Hudson Bay Master Fund Ltd., has voting and investment power over these securities. Sander Gerber is the managing member of Hudson Bay Capital GP LLC, which is the general partner of Hudson Bay Capital Management LP. Hudson Bay Capital Management LP may be deemed to be the beneficial owner of all shares of Class A common stock underlying the securities held by Hudson Bay Master Fund Ltd. Mr. Gerber disclaims beneficial ownership of these securities.

(2) Column 2 consists of (i) 3,055,657 shares of Common Stock and (ii) 5,905,661 shares of Common Stock issuable upon exercise of warrants (subject to 4.99% and 9.99% beneficial ownership limitations). Does not include 3,306,793 additional shares of Common Stock issuable under warrants because the selling shareholder does not have the right to receive such shares if the selling shareholder, together with certain attribution parties, would beneficially own in excess of 4.99% of the outstanding shares of our Common Stock. Column 4 consists of (i) 3,055,657 shares of Common Stock and (ii) 7,474,354 shares of Common Stock issuable upon exercise of warrants.

(3) Consists of (i) 8 shares of Common Stock issuable upon exercise of July 2014 Warrants, (ii) 1,600,000 shares of Common Stock issuable upon exercise of Series O Warrants, and (iii) 138,095 shares of Common Stock issuable upon exercise of Series Q Warrants.

(4) Intracoastal Capital, LLC - Intracoastal Capital LLC, Mitchell P. Kopin and Daniel B. Asher share voting and dispositive power over the shares. Mr. Kopin and Mr. Asher, each of whom are managers of Intracoastal Capital LLC, share voting control and investment discretion over the securities held by Intracoastal. As a result, each of Mr. Kopin and Mr. Asher may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities held by Intracoastal Capital LLC.

(5) Column 2 consists of (i) 3,255,658 shares of Common Stock and (ii) 5,686,684 shares of Common Stock issuable upon exercise of warrants. Column 4 consists of (i) 3,255,658 shares of Common Stock and (ii) 5,686,676 shares of Common Stock issuable upon exercise of warrants.

(6) Consists of shares of Common Stock issuable upon exercise of July 2014 Warrants.

(7) Alto Opportunity Master Fund, SPC – Segregated Master Portfolio B - Ayrton Capital LLC, the investment manager to Alto Opportunity Master Fund, SPC – Segregated Master Portfolio B, has discretionary authority to vote and dispose of the shares held by Alto Opportunity Master Fund, SPC – Segregated Master Portfolio B. Waqas Khatri is the managing member of Ayrton Capital LLC and in his capacity as director of Alto Opportunity Master Fund, SPC – Segregated Master Portfolio B, may also be deemed to have investment discretion and voting power over the shares held by Alto Opportunity Master Fund, SPC – Segregated Master Portfolio B. Mr. Khatri disclaims any beneficial ownership of these shares.

(8) Column 2 consists of (i) 5,434,247 shares of Common Stock and (ii) 2,075 shares of Common Stock issuable upon exercise of warrants (subject to a 9.99% beneficial ownership limitation) and does not include 8,047,317 additional shares of Common Stock issuable under warrants because the selling shareholder does not have the right to receive such shares if the selling shareholder, together with certain attribution parties, would beneficially own in excess of 4.99% of the outstanding shares of our Common Stock. Column 4 consists of 5,434,247 shares of Common Stock and does not include 7,944,880 additional shares of Common Stock issuable under warrants because the selling shareholder does not have the right to receive such shares if the selling shareholder, together with certain attribution parties, would beneficially own in excess of 4.99% of the outstanding shares of our Common Stock.

(9) Consists of (i) 2,075 shares of Common Stock issuable upon exercise of Series G Warrants, and (ii) 97,222 shares of Common Stock issuable upon exercise of Series Q Warrants.

(10) Dawson James Securities Inc. - We do not have any information about the beneficial ownership of these securities. Dawson James Securities Inc. acted as our placement agent in our April 2, 2019 offering of Common Stock and warrants and purchased the April 2019 PA Warrants in connection therewith. It is our understanding that Dawson James Securities Inc. purchased the April 2019 PA Warrants in the ordinary course of business, and at the time of purchase, Dawson James Securities Inc. had no agreements or understanding, directly or indirectly, with any person to distribute the April 2019 PA Warrants or the underlying Common Stock.

(11) Consists of shares of Common Stock issuable upon exercise of April 2019 PA Warrants.

(12) Jonathan Blum - Mr. Blum is an employee of Dawson James Securities Inc. and a former employee of WestPark, each of which has acted as our placement agent in past securities offerings in which he acquired his warrants. It is our understanding that Mr. Blum acquired his warrants in the ordinary course of business, and at the time of purchase, he had no agreements or understanding, directly or indirectly, with any person to distribute such warrants or the underlying Common Stock.

(13) Consists of (i) 13 shares of Common Stock issuable upon exercise of a February 2015 PA Warrant, (ii) 1 share of Common Stock issuable upon exercise of a June 2015 PA Warrant, (iii) 32,450 shares of Common Stock issuable upon exercise of a January 2018 PA Warrant, (iv) 193,919 shares of Common Stock issuable under an April 2018 PA Warrants, and (v) 312,632 shares of Common Stock issuable under a April 2019 PA Warrant.

(14) Dan Ross - Mr. Ross is an employee of Dawson James Securities Inc. and a former employee of WestPark, each of which has acted as our placement agent in past securities offerings in which he acquired his warrants. It is our understanding that Mr. Ross acquired his warrants in the ordinary course of business, and at the time of purchase, he had no agreements or understanding, directly or indirectly, with any person to distribute such warrants or the underlying Common Stock.

(15) Consists of (i) 13 shares of Common Stock issuable upon exercise of a February 2015 PA Warrant, (ii) 32,450 shares of Common Stock issuable upon exercise of a January 2018 PA Warrant, (iii) 193,919 shares of Common Stock issuable under an April 2018 PA Warrants, and (iv) 312,632 shares of Common Stock issuable under a April 2019 PA Warrant.

(16) Iroquois Master Fund Ltd. - Richard Abbe, who serves as the President of Iroquois Capital Management, LLC and managing member of Iroquois Capital Investment Group LLC, and Kimberly Page, who serves as a Director of Iroquois Master Fund Ltd., have shared voting and investment power over the securities held by Iroquois Master Fund Ltd. As a result, Iroquois Master Fund Ltd., Iroquois Capital Management, LLC, Mr. Abbe and Ms. Page each may be deemed beneficial owners of, and share voting and investment power over these securities.

(17) Consists of shares of Common Stock issuable upon exercise of warrants.

(18) WestPark Capital, Inc. – Richard Rappaport, in his capacity as Chief Executive Officer of WestPark has voting and investment power over the securities held by WestPark. Mr. Rappaport disclaims beneficial ownership of the shares of Common Stock not owned by him. WestPark has acted as our placement agent in past securities offerings. It is our understanding that WestPark purchased the warrants in the ordinary course of business, and at the time of purchase, WestPark had no agreements or understanding, directly or indirectly, with any person to distribute the warrants or the underlying Common Stock.

(19) Consists of (i) 20 shares of Common Stock issuable upon exercise of February 2015 PA Warrants, (ii) 48 shares of Common Stock issuable upon exercise of June 2015 PA Warrants, (iii) 53,100 shares of Common Stock issuable upon exercise of January 2018 PA Warrants, and (iv) 317,322 shares of Common Stock issuable under April 2018 PA Warrants.

(20) Roth Capital Partners, LLC - We do not have any information about the beneficial ownership of these securities. Roth has acted as our placement agent in past securities offerings. It is our understanding that Roth acquired the warrants in the ordinary course of business, and at the time of purchase, Roth had no agreements or understanding, directly or indirectly, with any person to distribute the warrants or the underlying Common Stock

(21) Consists of (i) 1,411 shares of Common Stock issuable upon exercise of an April 2016 PA Warrant, (ii) 30,834 shares of Common Stock issuable upon exercise of a December 2016 PA Warrant, (iii) 185,500 shares of Common Stock issuable upon exercise of a February 6, 2017 PA Warrant, and (iv) 120,000 shares of Common Stock issuable upon exercise of a February 9, 2017 PA Warrant.

(22) Empery Asset Master Ltd - Empery Asset Management LP, the authorized agent of Empery Asset Master Ltd ("EAM"), has discretionary authority to vote and dispose of the shares held by EAM and may be deemed to be the beneficial owner of these shares. Martin Hoe and Ryan Lane, in their capacity as investment managers of Empery Asset Management LP, may also be deemed to have investment discretion and voting power over the shares held by EAM. EAM, Mr. Hoe and Mr. Lane each disclaim any beneficial ownership of these shares.

(23) Consists of shares of Common Stock issuable upon exercise of Series G Warrants.

(24) Empery Tax Efficient II, LP - Empery Asset Management LP, the authorized agent of Empery Tax Efficient II, LP ("ETE II"), has discretionary authority to vote and dispose of the shares held by ETE II and may be deemed to be the beneficial owner of these shares. Martin Hoe and Ryan Lane, in their capacity as investment managers of Empery Asset Management LP, may also be deemed to have investment discretion and voting power over the shares held by ETE II. ETE II, Mr. Hoe and Mr. Lane each disclaim any beneficial ownership of these shares.

(25) Empery Tax Efficient, LP - Empery Asset Management LP, the authorized agent of Empery Tax Efficient, LP ("ETE"), has discretionary authority to vote and dispose of the shares held by ETE and may be deemed to be the beneficial owner of these shares. Martin Hoe and Ryan Lane, in their capacity as investment managers of Empery Asset Management LP, may also be deemed to have investment discretion and voting power over the shares held by ETE. ETE, Mr. Hoe and Mr. Lane each disclaim any beneficial ownership of these shares.

(26) Doug Kaiser - Mr. Kaiser was (and still may be) an employee of WestPark when he acquired his warrants. WestPark acted as our placement agent in past securities offerings in which he acquired his warrants. It is our understanding that Mr. Kaiser acquired his warrants in the ordinary course of business, and at the time of purchase, he had no agreements or understanding, directly or indirectly, with any person to distribute such warrants or the underlying Common Stock.

(27) Consists of (i) 1 share of Common Stock issuable upon exercise of a February 2015 PA Warrant, (ii) 9 share of Common Stock issuable upon exercise of June 2015 PA Warrants, (iii) 5,000 shares of Common Stock issuable upon exercise of January 2018 PA Warrants, and (iv) 12,500 shares of Common Stock issuable under April 2018 PA Warrants.

(28) Frank Salvatore - Mr. Salvatore was (and still may be) an employee of WestPark when he acquired his warrants. WestPark acted as our placement agent in past securities offerings in which he acquired his warrants. It is our understanding that Mr. Kaiser acquired his warrants in the ordinary course of business, and at the time of purchase, he had no agreements or understanding, directly or indirectly, with any person to distribute such warrants or the underlying Common Stock.

(29) Consists of (i) 1 share of Common Stock issuable upon exercise of February 2015 PA Warrants, (ii) 9 share of Common Stock issuable upon exercise of June 2015 PA Warrants, (iii) 5,000 shares of Common Stock issuable upon exercise of January 2018 PA Warrants, and (iv) 12,500 shares of Common Stock issuable under April 2018 PA Warrants.

(30) 683 Capital Partners, LP – We do not have any information about the beneficial ownership of these securities.

(31) Alder Capital Partners, LP - We do not have any information about the beneficial ownership of these securities.

(32) Capital Ventures International - We do not have any information about the beneficial ownership of these securities.

(33) OTA, LLC - We do not have any information about the beneficial ownership of these securities.

(34) Julie Kamps - Ms. Kamps was (and still may be) an employee of WestPark when she acquired her warrants. WestPark acted as placement agent for several of our past securities offerings in which she acquired her warrants. It is our understanding that Ms. Kamps acquired her warrants in the ordinary course of business, and at the time of purchase, she had no agreements or understanding, directly or indirectly, with any person to distribute such warrants or the underlying Common Stock.

(35) Consists of shares of Common Stock issuable upon exercise of June 2015 PA Warrants.

(36) Anson Investments Master Fund LP - Moez Kassem has authority to vote and dispose of the shares held by Anson Investments Master Fund LP and may be deemed the beneficial owner of the shares.

(37) BTG Investments, LLC - We do not have any information about the beneficial ownership of these securities.

(38) Palisade Long Short Alpha Master Fund (Cayman) Limited - We do not have any information about the beneficial ownership of these securities.

(39) Jason Stern - Mr. Stern was (and still may be) an employee of WestPark when he acquired his warrants. WestPark acted as placement agent for several of our past securities offerings in which he acquired his warrants. It is our understanding that Mr. Stern acquired his warrants in the ordinary course of business, and at the time of purchase, he had no agreements or understanding, directly or indirectly, with any person to distribute such warrants or the underlying Common Stock.

(40) Consists of shares of Common Stock issuable upon exercise of February 2015 PA Warrants.

(41) Gordon Roth - Mr. Roth was (and still may be) affiliated with Roth, who acted as placement agent for our July 9, 2014 private placement in which he acquired the securities. It is our understanding that Mr. Roth acquired the registrable securities in the ordinary course of business, and at the time of the purchase of the purchase of the registrable securities to be resold, Mr. Roth had no agreements or understanding, directly or indirectly, with any person to distribute the registrable securities.

(42) Jesse Pichel - Mr. Pichel was (and still may be) affiliated with Roth, who acted as placement agent for our July 9, 2014 private placement in which he acquired the securities. It is our understanding that Mr. Pichel acquired the registrable securities in the ordinary course of business, and at the time of the purchase of the purchase of the registrable securities to be resold, Mr. Pichel had no agreements or understanding, directly or indirectly, with any person to distribute the registrable securities.

(43) John Chambers - Mr. Chambers was (and still may be) affiliated with Roth, who acted as placement agent for our July 9, 2014 private placement in which he acquired the securities. It is our understanding that Mr. Chambers acquired the registrable securities in the ordinary course of business, and at the time of the purchase of the purchase of the registrable securities to be resold, Mr. Chambers had no agreements or understanding, directly or indirectly, with any person to distribute the registrable securities.

(44) John Weber - Mr. Weber was (and still may be) affiliated with Roth, who acted as placement agent for our July 9, 2014 private placement in which he acquired the securities. It is our understanding that Mr. Weber acquired the registrable securities in the ordinary course of business, and at the time of the purchase of the purchase of the registrable securities to be resold, had no agreements or understanding, directly or indirectly, with any person to distribute the registrable securities.

(45) Michael Aaron Margolis - Mr. Margolis is was (and still may be) affiliated with Roth, who acted as placement agent for our July 9, 2014 private placement in which he acquired the securities. It is our understanding that Mr. Margolis acquired the registrable securities in the ordinary course of business, and at the time of the purchase of the purchase of the registrable securities to be resold, Mr. Margolis had no agreements or understanding, directly or indirectly, with any person to distribute the registrable securities.

(46) Michael Chill - Mr. Chill was (and still may be) affiliated with Roth, who acted as placement agent for our July 9, 2014 private placement in which he acquired the securities. It is our understanding that Mr. Chill acquired the registrable securities in the ordinary course of business, and at the time of the purchase of the purchase of the registrable securities to be resold, Mr. Chill had no agreements or understanding, directly or indirectly, with any person to distribute the registrable securities.

(47) Theodore Roth - Mr. Roth was (and still may be) affiliated with Roth, who acted as placement agent for our July 9, 2014 private placement in which he acquired the securities. It is our understanding that Mr. Roth acquired the registrable securities in the ordinary course of business, and at the time of the purchase of the purchase of the registrable securities to be resold, Mr. Roth had no agreements or understanding, directly or indirectly, with any person to distribute the registrable securities.

PLAN OF DISTRIBUTION

From time to time after the date of this prospectus, we will directly offer and issue the shares of Common Stock issuable under the Shelf Warrants to the holders upon the exercise of the Shelf Warrants in accordance with their terms. For the holders to exercise the Shelf Warrants, there must be an effective registration statement and a current prospectus under the Securities Act covering the offering and sale of Common Stock issuable upon the exercise of the Shelf Warrants or an available exemption from registration under the Securities Act.

If at any time there is no effective registration statement on file with the SEC registering, or no current prospectus available for, the issuance or resale of the shares of our Common Stock issuable upon exercise of the Shelf Warrants, the Shelf Warrants may be exercised by means of a “cashless exercise” and we will not receive any proceeds at such time.

We are also registering the shares of Common Stock issuable upon exercise of the Private Warrants to permit the resale of these shares of Common Stock by the selling shareholders from time to time after the date of this prospectus. We will not receive any of the proceeds from the sale by the selling shareholders of the shares of Common Stock issuable upon exercise of the Private Warrants, although we will receive the exercise price of any Private Warrants not exercised by the selling shareholders on a cashless exercise basis.

The selling shareholders may sell all or a portion of the shares of Common Stock issuable upon exercise of the Private Warrants held by them and offered hereby from time to time directly or through one or more underwriters, broker-dealers or agents. If the shares of Common Stock issuable upon exercise of the Private Warrants are sold through underwriters or broker-dealers, the selling shareholders will be responsible for underwriting discounts or commissions or agent’s commissions. The shares of Common Stock issuable upon exercise of the Private Warrants may be sold in one or more transactions at fixed prices, at prevailing market prices at the time of the sale, at varying prices determined at the time of sale or at negotiated prices. These sales may be effected in transactions, which may involve crosses or block transactions, pursuant to one or more of the following methods:

- on any national securities exchange or quotation service on which the securities may be listed or quoted at the time of sale;
- in the over-the-counter market;
- in transactions otherwise than on these exchanges or systems or in the over-the-counter market;
- through the writing or settlement of options, whether such options are listed on an options exchange or otherwise;
- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the shares as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- short sales made after the date the registration statement is declared effective by the SEC;
- broker-dealers may agree with a selling shareholder to sell a specified number of such shares at a stipulated price per share;
- a combination of any such methods of sale; and
- any other method permitted pursuant to applicable law.

The selling shareholders may also sell shares of Common Stock issuable upon exercise of the Private Warrants under Rule 144, if available, rather than under this prospectus. In addition, the selling shareholders may transfer the shares of Common Stock issuable upon exercise of the Private Warrants by other means not described in this prospectus. If the selling shareholders effect such transactions by selling shares of Common Stock issuable upon exercise of the Private Warrants to or through underwriters, broker-dealers or agents, such underwriters, broker-dealers or agents may receive commissions in the form of discounts, concessions or commissions from the selling shareholders or commissions from purchasers of the shares of Common Stock issuable upon exercise of the Private Warrants for whom they may act as agent or to whom they may sell as principal (which discounts, concessions or commissions as to particular underwriters, broker-dealers or agents may be in excess of those customary in the types of transactions involved). In connection with sales of the shares of Common Stock issuable upon exercise of the Private Warrants or otherwise, the selling shareholders may enter into hedging transactions with broker-dealers, which may in turn engage in short sales of the shares of Common Stock issuable upon exercise of the Private Warrants in the course of hedging in positions they assume. The selling shareholders may also sell shares of Common Stock issuable upon exercise of the Private Warrants short and deliver shares of Common Stock issuable upon exercise of the Private Warrants covered by this prospectus to close out short positions and to return borrowed shares in connection with such short sales. The selling shareholders may also loan or pledge shares of Common Stock issuable upon exercise of the Private Warrants to broker-dealers that in turn may sell such shares.

The selling shareholders may pledge or grant a security interest in some or all of the Private Warrants or shares of Common Stock issuable upon exercise of the Private Warrants by them and, if they default in the performance of their secured obligations, the pledgees or secured parties may offer and sell the shares of Common Stock issuable upon exercise of the Private Warrants from time to time pursuant to this prospectus or any amendment to this prospectus under Rule 424(b)(3) or other applicable provision of the Securities Act amending, if necessary, the list of selling shareholders to include the pledgee, transferee or other successors in interest as selling shareholders under this prospectus. The selling shareholders also may transfer and donate the shares of Common Stock issuable upon exercise of the Private Warrants in other circumstances in which case the transferees, donees, pledgees or other successors in interest will be the selling beneficial owners for purposes of this prospectus.

To the extent required by the Securities Act and the rules and regulations thereunder, the selling shareholders and any broker-dealer participating in the distribution of the shares of Common Stock issuable upon exercise of the Private Warrants may be deemed to be “underwriters” within the meaning of the Securities Act, and any commission paid, or any discounts or concessions allowed to, any such broker-dealer may be deemed to be underwriting commissions or discounts under the Securities Act. At the time a particular offering of the shares of Common Stock issuable upon exercise of the Private Warrants is made, a prospectus supplement, if required, will be distributed, which will set forth the aggregate amount of shares of Common Stock issuable upon exercise of the Private Warrants being offered and the terms of the offering, including the name or names of any broker-dealers or agents, any discounts, commissions and other terms constituting compensation from the selling shareholders and any discounts, commissions or concessions allowed or re-allowed or paid to broker-dealers.

Under the securities laws of some states, the shares of Common Stock may be sold in such states only through registered or licensed brokers or dealers. In addition, in some states the shares of Common Stock may not be sold unless such shares have been registered or qualified for sale in such state or an exemption from registration or qualification is available and is complied with.

There can be no assurance that any selling shareholder will sell any or all of the shares of Common Stock issuable upon exercise of the Private Warrants registered pursuant to this registration statement, of which this prospectus forms a part.

The selling shareholders and any other person participating in such distribution will be subject to applicable provisions of the Exchange Act, and the rules and regulations thereunder, including, without limitation, to the extent applicable, Regulation M of the Exchange Act, which may limit the timing of purchases and sales of any of the shares of Common Stock issuable upon exercise of the Private Warrants by the selling shareholders and any other participating person. To the extent applicable, Regulation M may also restrict the ability of any person engaged in the distribution of the shares of Common Stock issuable upon exercise of the Private Warrants to engage in market-making activities with respect to the shares of Common Stock issuable upon exercise of the Private Warrants. All of the foregoing may affect the marketability of the shares of Common Stock issuable upon exercise of the Private Warrants and the ability of any person or entity to engage in market-making activities with respect to the shares of Common Stock issuable upon exercise of the Private Warrants.

We will pay all expenses of the registration of the shares of Common Stock issuable upon exercise of the Warrants, estimated to be \$70,000 in total, including, without limitation, SEC filing fees and expenses of compliance with state securities or “blue sky” laws. A selling shareholder will pay all underwriting discounts and selling commissions, if any. Under the terms of agreements entered into with some of the selling shareholders, we will indemnify the selling shareholders against liabilities, including some liabilities under the Securities Act or the selling shareholders will be entitled to contribution. Under the terms of such agreements, we may be indemnified by the selling shareholders against civil liabilities, including liabilities under the Securities Act that may arise from any written information furnished to us by the selling shareholder specifically for use in this prospectus or we may be entitled to contribution.

Once issued under the registration statement of which this prospectus forms a part, the shares of Common Stock issuable upon exercise of the Shelf Warrants will be freely tradable in the hands of persons other than our affiliates. Once resold under the registration statement of which this prospectus forms a part, the shares of Common Stock issuable upon exercise of the Private Warrants will be freely tradable in the hands of persons other than our affiliates.

DESCRIPTION OF SECURITIES TO BE OFFERED

Description of Common Stock

Our authorized Common Stock consists of 150,000,000 shares of Common Stock. As of April 12, 2019, there were 108,902,754 shares of our Common Stock outstanding. Although we believe the following summary description of our Common Stock set forth below is accurate, our articles of incorporation and our bylaws cover all material provisions affecting the rights of holders of our Common Stock. This summary is not intended to be complete and is qualified by reference to the provisions of applicable law and to our articles of incorporation and bylaws.

Voting Rights

Each holder of shares of Common Stock is entitled to one vote for each share held on all matters submitted to a vote of shareholders. There are no cumulative voting rights. All holders of shares of Common Stock vote as a single group on all matters that are submitted to the shareholders for a vote. Accordingly, holders of a majority of the shares of Common Stock entitled to vote in any election of directors may elect all of the directors who stand for election. Our entire Board of Directors stands for election each year. A required number of shareholders having the minimum number of votes that would be necessary to authorize or take action at a meeting at which all of the shares entitled to vote thereon were present and voted may consent to an action in writing and without a meeting under certain circumstances.

Dividends and Liquidation

Subject to any preferential rights of any outstanding shares of preferred stock, if any, shares of Common Stock are entitled to receive dividends, if any, as may be declared by our Board of Directors out of legally available funds. In the event of a liquidation, dissolution or winding up of our company, the shares of Common Stock are entitled to our assets remaining after the payment of all of our debts and other liabilities, including preferential payments made to holders of any outstanding shares of preferred stock. Holders of shares of Common Stock have no preemptive, subscription or redemption rights, and there are no redemption or sinking fund provisions applicable to the shares of Common Stock.

Anti-Takeover Effects of Our Articles of Incorporation and Bylaws

The following provisions, which are contained in our articles of incorporation or bylaws, could have the effect of delaying, deferring or preventing a change in control of our company.

Our articles of incorporation and bylaws provide that our board may consist of any number of directors, which may be fixed from time to time by our board. Newly created directorships resulting from any increase in our authorized number of directors may be filled by the affirmative vote of a majority of the directors then in office or by an election at an annual meeting or special meeting of shareholders called for that purpose. Any vacancies on our board resulting from death, resignation, retirement, disqualification, removal from office or other cause may be filled a majority of our board then in office, even if less than a quorum is remaining in office.

Our bylaws require advance notice by a shareholder of any proposal to be brought before an annual meeting of shareholders by a shareholder, including any nomination for election of directors by any shareholder entitled to vote for the election of directors at the meeting. Our bylaws also provide that no shareholder proposal may be considered at a meeting of our shareholders unless the proposal relates to a matter on which a shareholder vote is required by our charter, bylaws or by applicable law.

Our Board of Directors has the power to issue preferred stock with designations, preferences, limitations and relative rights determined by the Board of Directors without any vote or action by shareholders. The issuance of preferred stock or of rights to purchase preferred stock could have the effect of making it more difficult for a third party to acquire Real Goods Solar, or of discouraging a third party from attempting to acquire Real Goods Solar.

Subject to repeal or change by action of our shareholders, our board may amend, supplement or repeal our bylaws or adopt new bylaws.

Registration Rights

We have entered into registration rights agreements or otherwise agreed to register the issuance or resale of the shares of Common Stock issuable upon exercise of certain Warrants. Where applicable, we may be subject to monetary penalties if a registration statement is not available for the issuance or resale of the shares of Common Stock issuable upon exercise of some of the Warrants. We believe we have satisfied all current registration obligations owed to holders of Warrants to date and are filing the registration statement of which this prospectus is a part voluntarily.

Description of Warrants

The descriptions of the Warrants under the section entitled “*Description of the Transaction – Description of the Warrants*” is incorporated herein by this reference.

DESCRIPTION OF BUSINESS

Overview

RGS Energy and its subsidiaries have provided solar energy systems to homeowners, and commercial building owners in the United States since 1978. We believe that solar energy adoption is still in the early stages and will continue to increase as utility rates rise and customers become more knowledgeable about the savings clean and sustainable solar energy can deliver. RGS and our predecessors have installed over 26,000 solar energy systems across the continental United States and Hawaii.

We endeavor to make the move to solar energy simple for our customers by managing and executing the process with our sales and installation teams. We design and offer a suitable solar energy solution, then procure, permit, install, and interconnect the system to the utility grid. We provide a comprehensive workmanship warranty on each fully operational system.

On September 29, 2017 we executed the License with Dow for its POWERHOUSE™ in-roof solar shingle, an innovative and aesthetically pleasing solar shingle system developed by Dow. The POWERHOUSE™ 1.0 and 2.0 versions used CIGS (copper indium gallium selenide solar cells) technology which had a high manufacturing cost, resulting in the product not being consumer price friendly. Conversely, the POWERHOUSE™ 3.0 has been developed with traditional silicon solar cells to increase solar production and to provide a competitive consumer price point. On November 2, 2018 we received UL certification for POWERHOUSE™ 3.0 and began to commercialize the product in North America. We have engaged third-party manufacturers for production and distribution logistics and to provide services to the home building and roofing industries.

We were incorporated in Colorado in 2008 as a successor to Gaiam Energy Tech, Inc. founded in 1999.

A description about our operating segments and the financial information about our segments may be found in Note 15. Segment Information, to our audited financial statements, included in Item 8 of the Financial Statements included in this prospectus.

Business Strategy

Our goals are to (i) provide solar solutions that save residential and commercial customers' money and (ii) operate our Company at a profit. Our strategies to achieve these goals are:

- *Commercialize the POWERHOUSE™ 3.0 in-roof solar shingle.* We have executed an exclusive domestic and international world-wide License with Dow for its POWERHOUSE™ 3.0 in-roof solar shingle to provide customers with a more aesthetically pleasing solar shingle system. We plan to sell the product directly to homebuilders and develop a network of authorized roofers. We have started to market POWERHOUSE™ 3.0 in the United States and hope to expand internationally in the future.

We believe that as we have just started manufacturing and marketing POWERHOUSE™, it will take us several quarters to commercialize this new product and achieve a balance between customer demand and the manufacturing production by our contract supply chain. We believe that we will require time to build brand awareness for this new product and, accordingly, we expect our sales to begin slowly and grow in future periods.

- *Utilize our call center.* In past years, we have built a call center in our headquarters in Colorado to conduct sales via the phone and internet. This provides a cost-effective mechanism to reach potential customers and enter new markets. We plan to expand into new states of operation in 2019. Call center personnel have access to engineering, operations, customer support and other services personnel at our headquarters location allowing them to quickly address any questions that might arise during the sales process.
- *Continue to drive growth through referrals networks.* We pay customers and others for referring additional customers. We will continue to expand these programs through the call center, post-install in-home parties, user-friendly software, and digital marketing.
- *Identify attractive financing options for customers.* We refer our customers to a variety of options for financing their solar energy systems including home improvement loans, equipment leases and power purchase agreements.
- *Utilize technology to enhance and streamline our operations.* We launched RGS 365™, a mobile software and online dashboard suite, creating what we believe is a better and more engaging customer experience.

Our Competitive Strengths

We believe being awarded the exclusive worldwide POWERHOUSE™ License will give us a competitive advantage because we expect to become a technology company insulated by patents creating a barrier to competition, as well as a company selling a product with brand recognition.

Historically, we believe our customers select us because:

- *We have been in the solar industry for over 40 years.*
- *Flexible menu of product financing options.* Our customers can utilize cash, loans, and third-party ownership agreements, such as leasing and power purchase agreements, to acquire our products.
- *Location.* We are located in states where utility costs are high and/or incentives for solar energy systems are available, therefore offering an attractive alternative to conventional power sources.

Description of our Product and Services

We had two operating divisions as of the end of 2018: (i) POWERHOUSE™ and (ii) Solar Division.

POWERHOUSE™: On September 29, 2017, we executed the License with Dow, to commercialize *POWERHOUSE™* 3.0. Under the terms of the License, we have exclusive world-wide rights through 2034, the expiration of Dow’s applicable patents. The License requires that we obtain UL certification to commercialize and sell a minimum of 50 megawatts of solar within 5-years after obtaining UL certification to retain exclusive world-wide rights, a requirement we believe is achievable. We obtained UL certification on November 2, 2018. We have entered into third-party manufacturing agreements with suppliers and have begun to market *POWERHOUSE™* solar shingles to a network of new home builders and roofers.

Solar Division: The Solar Division performs installations of residential and commercial solar systems in the continental United States (also referred to as “Mainland”) and in Hawaii, doing business as Sunetric. On March 27, 2019, our Board of Directors determined to exit our Mainland residential solar business to focus on the *POWERHOUSE™* in-roof shingle market and reduce overall cash outflow, with the goal of maximizing future shareholder value. We offer our turnkey solar energy systems providing design, engineering, financing, procurement, permitting, installing, grid interconnection, monitoring, and maintenance services. We install residential systems generally between 3 kilowatts (“kW”) and 10 kW, and commercial systems up to 500 kW in size, depending on the amount of electricity used by the customer and the size of their building. The size of the average solar energy system we installed during 2018 was approximately 8.7 kW. We maintain a service department to manage and assist with service and repairs, and to provide operations and maintenance service contracts for larger projects. We design and build solar energy systems to meet each customer’s individual needs and circumstances. We assess a customer’s annual power requirements and average electricity rates to size the solar system and engineer its interconnection to the grid. We assess the customer’s roof size, configuration, and composition to determine the optimum location for the solar photovoltaic modules. We factor in information about the customer’s electrical service territory, rate structures, budget, preferred financing method and aesthetic preferences. We also identify the relevant federal, state and local regulations, including building codes, which are important to the cost, operation and return on investment of the customer’s solar energy system, as well as relevant tax rates, benefits of net metering, and various other factors. We assess this data using solar production tools and analytical models to size and configure a cost-effective solar system for the customer and one that offers a return on investment to the customer that meets their requirements.

We prepare construction plans to obtain a building permit, which is necessary for grid interconnection and state incentive rebate processing. We also provide customers with a return-on-investment analysis which reflects the rebates and performance-based incentives that are available to each customer. Once all necessary approvals from financing partners and utilities, and incentive, rebate and jurisdictional authorities have been received, our in-house construction teams or authorized integrators begin the installation of the customer’s solar energy system. Once the solar energy system has been installed, we arrange for a final inspection by the local building department or other relevant regulatory agency and complete final as-built drawings of the system to submit applicable applications for the jurisdictional rebate(s). At the same time, we apply to the local utility company to finalize interconnection of the customer’s solar energy system to the utility grid.

Solar Energy Systems

The most visible component of solar energy systems are the solar shingles or photovoltaic modules with metal racking which transforms the sunlight into direct electrical current (“DC”), which then travels to the inverter. The inverter converts the DC electricity into useable alternating current that matches the current of the household electrical service and the utility grid. Other major components include the monitoring system which tracks the solar production of the system, and balance of system which includes mechanical and electrical parts. The electricity created can go onto the grid or be used by the customer to power household items such as lights and appliances. For customers who would like to have electrical black out protection or who want to strategically manage their electrical usage, we provide battery solutions that integrate with our solar energy systems.

POWERHOUSE™: Our product is a built-in photovoltaic array (“BIPV”), also known as a solar shingle. The solar shingle is a building material that once installed becomes the roof structure. The BIPV is the equivalent of the photovoltaic module and racking of a traditional solar energy installation. We do not install these systems. Instead, we manufacture the solar shingle for distribution to our targeted customers.

Solar Division: The Solar Division sells and installs traditional modules and racking photovoltaic solar energy systems. We do not manufacture any of these components. We purchase all components from the manufacturer or their distributors.

Warranty Terms

POWERHOUSE™: We issue a manufacturer's warranty on POWERHOUSE™ solar shingles, equal to the third-party manufacturer terms we secure. Workmanship warranty will be provided by the installer. Our new home builder and roofer network, when applicable, will submit to us a return merchandise authorization ("RMA") for defective components. We will authorize the RMA and transfer substitute POWERHOUSE™ component(s) to the customer who will return a like number of defective components. We will similarly execute a RMA with the appropriate manufacturer.

Solar Division: We and our suppliers offer warranties of up to 10 years for parts and labor, including property damage arising from workmanship, excluding roof penetrations which are generally warranted for a period of 5 years. All major components installed in a photovoltaic system array are covered under transferable manufacturers' warranties, which generally range from 10 to 25 years. Customer claims are processed through our customer service department. We will provide reasonable assistance to our customers in contacting the manufacturer concerning warranty service and undertake reasonable effort to recoup our labor costs from the manufacturer.

Financing

We make available to our POWERHOUSE™ local roofing company customers a business-to-business lender to finance their purchases from us.

We offer our Solar Division customers a choice to finance their solar systems with their cash, third-party loans, or third-party leases or power purchase agreements. We are constantly vetting new financing products and only refer the ones that fit the customer's needs and desires. Our menu of finance offerings allows us to provide solar energy systems to our customers with financing terms that we believe are economically attractive for their individual situation.

Sales and Marketing

Our targeted customers for our POWERHOUSE™ in-roof solar shingle include (i) homeowners, (ii) local roofing companies, (iii) solar installation companies, (iv) custom homebuilders and (v) mass market homebuilders. We utilize our call center to contact customers in our geographic markets. We offer additional services, such as marketing support, referrals and on-site training to roofing companies that complete our requirements for becoming a POWERHOUSE™ Professional.

We have and plan to continue to make marketing expenditures to develop brand name recognition for POWERHOUSE™. Our marketing has to-date included digital marketing, attendance at trade shows and expos, and we have arranged for television presentations.

In the Solar Division, we have trained our residential and commercial sales organization to effectively engage prospective customers from initial interest to customized proposals to signed contracts. As previously disclosed, we are exiting our Mainland residential solar business. We intend to continue to educate consumers about the benefits of our solar products in order to lower our customer acquisition costs and further expand the market opportunity.

- **Inside sales** – Our inside sales groups initially engage with potential customers prior to our outside sales or e-sales teams' customer engagement. Inside sales groups identify each potential customer's initial interest in solar energy and compile data necessary to assess potential cost savings for subsequent discussion with the potential customer by the sales teams.

- **Direct outside sales** – We employ an outside commercial sales force in the east coast markets and Hawaii to generate new business and complete sales orders. Effective March 1, 2018, we completed a realignment of our sales teams resulting in the elimination of our east coast residential sales force.
- **Customer referrals** – Our customer referral program is designed to be an effective and efficient method of reaching new customers. Our program provides cash incentives to current customers to refer friends, relatives and co-workers.
- **Online Digital Marketing** – Consumers seek online education, purchase options, and business reviews before determining the best provider to meet their needs. To align our business with marketplace, and our sales teams with the consumer, we continue to expand our online market presence.

Customers

POWERHOUSE™: Our customers will include homeowners, new homebuilders, engineering, procurement and construction (“EPC”) solar companies and roofers in the re-roof market. We estimate there are approximately 7 million re-roofs and new home construction annually in the United States.

Solar Division: Our residential customers are homeowners interested in reducing electrical utility costs and switching to clean, renewable energy. Our residential solar energy systems are generally rooftop installations up to 24kW in size.

Our commercial customers come from a variety of industries including retail, manufacturing, service, not-for-profit and municipal services. Oftentimes, our small commercial clients arise from the relationship developed when we install a residential solar system to the owner of the small business. Our commercial solar energy systems may be roof mounted or ground mounted and are generally up to 500kW in size. Occasionally, through the course of our normal operations, we are presented with opportunities for larger (greater than 500kW) commercial solar energy systems. We evaluate each of these large opportunities on a case by case basis while minimizing onerous contract terms.

Suppliers

POWERHOUSE™: We engage third-party manufacturers to manufacture components of the in-roof POWERHOUSE™ solar shingle. The major components of the POWERHOUSE™ solar shingle consist of the solar laminate, connectors, wire harnesses, base assembly and integrated flashing system. The solar laminate, connectors and wire harnesses are produced by a manufacturer located in China and shipped to our U.S. based manufacturer of the baseplate for assembly into a solar shingle. The solar shingle is then shipped to our third-party logistics provider to warehouse and distribute kitted systems to our customers.

Solar Division: Our solar energy systems utilize photovoltaic modules and inverters purchased from several manufacturers and distributors. The majority of these materials are “Buy American” under the American Recovery and Reinvestment Act of 2009. We negotiate pricing based on quantity purchased and payment terms. Generally, we purchase major components as needed and do not have long-term or volume commitments with suppliers.

Competition

POWERHOUSE™: Dow developed the POWERHOUSE™ solar shingle and holds various related worldwide patents. Since we obtained the exclusive License to commercialize the product worldwide from Dow, the patents and licenses provide a barrier to entry, thereby limiting the number of competitors. Existing sources of competition include Tesla, Inc., Suntegra and CertainTeed, whom we compete with on market penetration, price and aesthetics. We believe we compete favorably with these companies.

Solar Division: We believe our primary competitors are the traditional local utilities that supply energy to our potential customers. We compete with these traditional utilities primarily based on price, predictability of price and the ease by which customers can switch to electricity generated by our solar energy systems rather than fossil-based alternatives. We believe that our pricing and focus on customer relationships allow us to compete favorably with traditional utilities in the regions we service.

Other sources of competition are other solar energy system providers such as Tesla, Inc., Vivint Solar Inc., Sunrun Inc., Sungevity, Inc., and many others. These companies may offer products that are similar to our solar energy systems, and we primarily compete with these companies based on price. We believe that we compete favorably with these companies.

Regulations

POWERHOUSE™: We will have to maintain compliance with UL standards on POWERHOUSE™ 3.0 solar shingles and on any future new product development.

Solar Division: An interconnection agreement is generally required from the applicable local electricity utility to interconnect a solar energy system with the utility grid. In almost all cases, interconnection agreements are standard form agreements that have been pre-approved by the local public utility commission or other regulatory body with jurisdiction over interconnection. As such, no additional regulatory approvals are required once interconnection agreements are signed. We prepare and submit these agreements on behalf of our customers to ensure compliance with interconnection rules.

Our operations are subject to stringent and complex federal, state and local laws and regulations governing the occupational health and safety of our employees and wage regulations. For example, we are subject to the requirements of the federal Occupational Safety and Health Act, as amended, or “OSHA”, and comparable state laws that protect and regulate employee health and safety. We expend resources to comply with OSHA requirements and industry best practices. Federal and/or state prevailing wage requirements, which generally apply to any “public works” construction project that receives public funds, may apply to installations of our solar energy systems on government facilities. The prevailing wage is the basic hourly rate paid on public works projects to a majority of workers engaged in a particular craft, classification or type of work within a particular area. Prevailing wage requirements are established and enforced by regulatory agencies. Our in-house personnel monitor and coordinate our continuing compliance with these regulations when required.

Some jurisdictions place limits on the size or number of solar energy systems that can be interconnected to the utility grid. This can limit our ability to sell and install solar energy systems in some markets. The regulatory environment is constantly changing.

Government Incentives and Policies

U.S. federal, state and local governments have established various policies, incentives and financial mechanisms to reduce the cost of solar energy and to accelerate the adoption of solar energy. These incentives include tax credits, cash grants, production-based incentives, tax abatements and rebates. These incentives help catalyze private sector investments in solar energy, energy efficiency and energy storage measures, including the installation and operation of residential and commercial solar energy systems.

Following the extension of the Solar Investment Tax Credit in December 2015, the Internal Revenue Code allows a United States taxpayer to claim a tax credit of 30% of qualified expenditures for a solar energy system that is placed in service on or before December 31, 2019. This credit is scheduled to decline to 26% effective January 1, 2020, 22% in 2021, and then to 10% for commercial projects and 0% for residential projects in 2022.

Many U.S. states and local jurisdictions have established property tax incentives for renewable energy systems, which include exemptions, exclusions, abatements and credits. Many state governments, investor-owned utilities, municipal utilities and co-operative utilities offer rebates or other cash incentives for the installation and operation of a solar energy system or energy-related products.

Many states have a regulatory policy known as net energy metering, or net metering. Net metering typically allows our customers to interconnect their on-site solar energy systems to the utility grid and offset their utility electricity purchases by receiving a bill credit at the utility's retail rate for energy generated by their solar energy system that is exported to the grid in excess of electric load used by customers.

Some states have established limits on net metering, fees on solar energy systems, or reduced the credit available for electricity generated by solar energy systems that are connected to the utility grid. For example, Hawaii, Nevada and Mississippi have announced net metering policies that establish wholesale rates, not retail rates, for crediting electricity produced by solar energy systems. This has adversely impacted the attractiveness of solar energy to residential customers in these markets. The California Public Utilities Commission issued a ruling that maintains the net energy metering credit at full retail value but adds new charges and requirements for customers installing a solar energy system. On the other hand, other states continue to expand their net metering programs. New York, for example, has suspended its cap on solar photovoltaic systems covered by the state's net metering program.

Some states like Massachusetts have offered Solar Renewable Energy Credits ("SRECs") that provide cash payments based on the electricity produced by solar energy systems as an incentive for customers to invest in these systems. These programs are generally capped and must be reauthorized or extended when the cap is reached in order for the incentives to be continued. The Massachusetts Department of Energy Resources announced that the total capacity available under its most recent SREC program (SREC-II) for projects over 25 kW had been exceeded in early 2016, however it was announced on January 31, 2017 by the Massachusetts Department of Energy Resources that their new program, called Solar Massachusetts Renewable Target ("SMART"), is targeted to start in April 2018 and that the SREC II program would be extended in order to bridge between the two programs. The SREC II program was ultimately extended until November 26, 2018, at which point the first applications for SMART were accepted. The first SMART incentive allocations began January 15, 2019.

On January 22, 2018, the Office of the President of the United States approved in substantial form, recommendations by the U.S. International Trade Commission to impose a tariff of 30% on imports of solar cells and photovoltaic modules under Section 201 of the Trade Act of 1974, unless specifically excluded. The 30% tariff declines 5% per year over the four-year term of the tariff. Further, the provisions of the 201 Tariff are applicable to imported solar cells and modules from Canada, despite its being a member of the North American Free Trade Act.

Seasonality

Our quarterly net revenue and operating results for solar energy system installations are difficult to predict and have, in the past, and may, in the future, fluctuate from quarter to quarter as a result of changes in state, federal, or private utility company subsidies, as well as weather, economic trends and other factors. We have historically experienced seasonality in our solar installation business, with the first quarter representing our lowest installation quarter of the year, primarily due to adverse weather. We have historically experienced seasonality in our sales of solar systems, with the fourth and first quarters of the year seeing less sales orders than the second and third quarters. As previously disclosed, we are exiting our Mainland residential solar business.

As we have just begun to market POWERHOUSE™ in-roof shingles, we do not have historical experience to assess seasonality for this line of business.

Employees

As of April 10, 2019, we had approximately 70 total and full-time employees. None of our employees are represented by a labor union or subject to a collective bargaining agreement.

Offerings

On January 4, 2018, we closed the January 2018 Offering. On April 9, 2018, we closed the April 2018 Offering. On April 2, 2019, we closed the April 2019 Offering.

DESCRIPTION OF PROPERTY

Our principal executive offices are located in Denver, Colorado. The following table sets forth certain information relating to our primary facilities:

<u>Primary Locations</u>	<u>Size (sq. ft.)</u>	<u>Use</u>	<u>Lease Expiration</u>	<u>Business Segment</u>
Denver, CO	12,477	Corporate Headquarters	May-22	All
Bloomfield, CT	10,000	Office and warehouse	Nov-19	Solar Division
Kailua, HI	10,000	Office and warehouse	Dec-19	Solar Division

Existing facilities have lease renewal options ranging from 1 month to 5 years.

LEGAL PROCEEDINGS

From time to time, we are involved in legal proceedings that we consider to be in the normal course of business.

MARKET PRICE OF AND DIVIDENDS ON COMMON EQUITY AND RELATED SHAREHOLDER MATTERS

Market Information and Holders

Effective February 15, 2019, our Common Stock was quoted on the OTCQX under the symbol "RGSE." Any over-the-counter market quotations reflect inter-dealer prices, without retail mark-up, mark-down or commissions and may not necessarily represent actual transactions. Prior to such date, our Common Stock traded on the Nasdaq Capital Market under the same symbol.

On April 12, 2019, we had 89 shareholders of record and 108,902,754 shares of \$.0001 par value Common Stock and zero shares of \$.0001 par value Class B common stock outstanding.

Dividend Policy

We have not declared or paid any cash dividends on our Common Stock, and we do not anticipate doing so in the foreseeable future. We currently intend to retain future earnings, if any, to operate our business and support our future growth strategies. Any future determination to pay dividends on our Common Stock will be at the discretion of our Board of Directors and will depend on our financial condition, results of operations, contractual restrictions, restrictions imposed by applicable law, capital requirements and other factors that our Board of Directors deems relevant.

Equity Compensation Plan Information

The following table summarizes equity compensation plan information for our Common Stock as of December 31, 2018:

	<u>Number of securities to be issued upon exercise of outstanding options</u>	<u>Weighted average exercise price of outstanding options</u>	<u>Number of securities remaining available for future issuance under equity compensation plans</u>
Equity compensation plans approved by security holders	<u>1,206,645</u>	<u>\$ 3.22</u>	<u>93,500</u>

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion and analysis provides information that we believe is relevant to an assessment and understanding of our results of operation and financial condition. You should read this analysis in conjunction with our audited consolidated financial statements and related footnotes. This discussion and analysis contain statements of a forward-looking nature relating to future events or our future financial performance. These statements involve known and unknown risks, uncertainties and other factors that may cause actual results, level of activity, performance or achievements to be materially different from any future results, levels of activity, performance or achievements expressed or implied by these forward-looking statements, including those set forth in this prospectus.

Overview

For the last 40 years, we have been a residential and small business commercial solar EPC company. We offer turnkey services, including design, procurement, permitting, build-out, grid connection, financing referrals and warranty and customer satisfaction activities. Our solar energy systems use high-quality solar photovoltaic modules. We use proven technologies and techniques to help customers achieve meaningful savings by reducing their utility costs. In addition, we help customers lower their reliance upon fossil fuel energy sources.

As of September 29, 2017, we are the exclusive domestic and international licensee of the POWERHOUSE™ in-roof solar shingle, an innovative and aesthetically pleasing solar shingle system developed by Dow. During 2018, we received UL certification for POWERHOUSE™ 3.0 and manufactured our initial solar shingles during December 2018. We anticipate that in the future, the majority of our revenue will arise from sales of POWERHOUSE™ in-roof solar shingles to local roofing companies, solar installers and homebuilders.

We, including our predecessors, have more than 40 years of experience in residential solar energy and trace our roots to 1978, when Real Goods Trading Corporation sold the first solar photovoltaic panels in the United States. We have designed and installed over 26,000 residential and commercial solar energy systems since our founding.

We operate as three reportable segments: (1) Solar Division – the installation of solar energy systems for homeowners, including lease financing thereof, and small business commercial in the United States; (2) POWERHOUSE™ - the manufacturing and sales of solar shingles; and (3) Other – corporate operations. On March 27, 2019, our Board of Directors determined to exit its mainland residential solar business to focus on the POWERHOUSE™ in-roof shingle market and reduce overall cash outflow, with the goal of maximizing future shareholder value. We believe this structure and realignment enables us to effectively manage our operations and resources.

As an EPC, we generally recognize revenue from solar energy systems sold to our customers when we install the solar energy system. Our business requires that we incur costs of acquiring solar panels and labor to install solar energy systems on our customer rooftops up-front and receive cash from customers thereafter. As a result, during periods when we are increasing sales, we expect to have negative cash flow from operations.

As a manufacturer of POWERHOUSE™, we will recognize revenue upon shipment of materials related to customer purchase order fulfillment. During 2018, we established a supply chain to manufacture POWERHOUSE™. We also began building a nationwide network of local roofers and solar installers. We received our first purchase order from a customer on December 27, 2018 and shipped to the customer in January 2019.

POWERHOUSE™ License

A material significant event occurred on September 29, 2017, when we executed the License with Dow, providing us an exclusive domestic and international right to commercialize the POWERHOUSE™ in-roof solar shingle, an innovative and aesthetically pleasing solar shingle system developed by Dow. The POWERHOUSE™ 1.0 and 2.0 versions used CIGS (copper indium gallium selenide solar cells) technology which had a high manufacturing cost, resulting in the product not being consumer price friendly. Conversely, the POWERHOUSE™ 3.0 version was developed with traditional silicon solar cells to increase solar production and to provide a competitive consumer price point.

In addition to the License, we executed a Trademark License Agreement (the "TLA"), a Technology Service Agreement and a Sales Agreement-Surplus Property (the "Sales Agreement") with Dow. The execution of the TLA allows us to market the POWERHOUSE™ 3.0 product using the Dow name.

Under the terms of the License, we will produce, market and sell POWERHOUSE™ 3.0, for which we paid a license fee of \$3 million along with a royalty fee equal to 2.5% against net sales of the POWERHOUSE™ product and services, payable quarterly in arrears. Further, we were responsible for all costs to obtain UL certification and we are responsible for the prosecution of all related patents world-wide, which may be offset against the payment of the royalty fee. During December 2018, we began commercialization of POWERHOUSE™ 3.0 entailing the manufacturing, marketing and sale of POWERHOUSE™ 3.0 to roofing companies.

As of December 31, 2018, we have invested approximately \$3.2 million that has been capitalized to the POWERHOUSE™ License, an intangible asset on the Consolidated Balance Sheet.

Other Key Metrics

Backlog

Backlog is discussed below and an important metric as we implement our revenue growth strategy.

Key Operational Metric, Gross Margin on Mainland Residential Operations, Currently Our Largest EPC Operating Unit

We utilize a job costing system whereby employees record their time to projects. We accumulate the cost of idle time reflecting the cost we incur to maintain a construction organization until our revenue grows, allowing for greater utilization of our construction organization. Cost of goods sold (“COGS”) include direct project installation costs (materials, labor, travel, financing fees, and estimated warranty costs) and indirect costs for project installation support (including un-utilized labor of idle time of construction crews, supplies, and insurance). We employ an internal time reporting system to determine COGS and resulting gross margin percentage which is used by the Company to measure its performance in achieving gross margin percentage targets. Further, we measure COGS per watt based upon COGS, excluding idle time, divided by the aggregate watts of systems installed during the period. For financial reporting purposes, COGS include the idle time of construction crews currently maintained by the Company in anticipation of future growth of backlog. Gross margin percentage on actual installation time is not a measure defined by generally accepted accounting principles.

Our gross margin percentage on actual installations and with idle time decreased year over year in part due to a greater mix of small commercial projects in 2018 as compared to 2017, as these projects typically have lower margins than our residential installations. Additionally, a majority of indirect labor costs are fixed, which lowers the gross margin % with idle time when there is a decline in revenue as we experienced in 2018 vs. 2017.

	Twelve Months Ended	
	December 31, 2018	December 31, 2017
Gross margin percentage on actual installation time	21%	24%
Gross margin percentage including idle time	6%	13%

Backlog

Backlog represents the dollar amount of revenue that may be recognized in the future from signed contracts to install solar energy systems that have not yet been installed without taking into account possible future cancellations. Backlog is not a measure defined by generally accepted accounting principles and is not a measure of contract profitability. Our methodology for determining backlog may not be comparable to methodologies used by other companies in determining their backlog amounts. The backlog amounts we disclose are net of cancellations received and include anticipated revenues associated with (i) the original contract amounts, and (ii) change orders for which we have received written confirmations from customers. Backlog may not be indicative of future operating results, and projects in our backlog may be cancelled, modified or otherwise altered by customers.

The following table summarizes changes to our backlog for our Solar Division for the years ended December 31, 2018 and December 31, 2017:

(in thousands)	Solar Division
Backlog at January 1, 2017	\$ 9,375
Bookings from new awards (“Sales”)	26,596
Cancellations and reductions on existing contracts	(9,206)
Amounts recognized in revenue upon installation	(14,000)
Backlog at December 31, 2017	12,765
Bookings from new awards (“Sales”)	26,744
Cancellations and reductions on existing contracts	(12,835)
Amounts recognized in revenue upon installation	(11,017)
Backlog at December 31, 2018	\$ 15,657

We have experienced a high level of contract cancellations, which we attribute to (i) the competitive nature of the solar industry wherein customers shop price after signing a contract and exercise their right to cancel during a three day rescission period after we countersign their contract, (ii) customer home’s physical condition requires upgrades that they may not be able to afford or reduces their return on investment, and (iii) delays to installing their system within their desired timeframe which are often a result of prolonged periods of time to receive local utility approval for installations. We determined that for optimum internal operations, and customer satisfaction, that a backlog equivalent to a few months of sales is optimal.

Revenue Growth Strategy

Our plans to increase revenue include:

- Manufacture, market and sell the POWERHOUSE™ 3.0 to roofing companies, solar installers and home builders;
- Leverage the POWERHOUSE™ brand to generate leads and revenue for the Solar Division;
- Leverage our investment in RGS 365™ customer-centric software for the POWERHOUSE™ and Solar Divisions;
- Expand our digital marketing program to generate customer leads while achieving our desired cost of acquisition;
- Make available to our customers, additional third-party providers to finance customer acquisitions of our solar energy systems;
- Expand our EPC operations to new states; and
- Expand our network of authorized third-party installers.

Recent Developments

On March 27, 2019, our Board of Directors determined to exit our mainland residential solar business to focus on the POWERHOUSE™ in-roof shingle market and reduce overall cash outflow, with the goal of maximizing future shareholder value. We believe this structure and realignment enables us to effectively manage our operations and resources. This realignment is expected to result in the reduction of workforce payroll plus burden of approximately \$4.0 million annually. Revenues and net loss in 2018 for the mainland residential solar business were approximately \$8.9 million and \$6.3 million, respectively. In order for us to convert our existing backlog to revenue, we plan to use authorized integrators to complete installations throughout the remainder of 2019.

Critical Accounting Policies and Estimates

Our discussion and analysis of our financial condition and results of operations are based on our financial statements, which have been prepared in accordance with U.S. generally accepted accounting principles, or “GAAP.” The preparation of these financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenue and expenses. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions. We have identified the following to be critical accounting policies whose application have a material impact on our reported results of operations, and which involve a higher degree of complexity, as they require us to make judgments and estimates about matters that are inherently uncertain.

Revenue Recognition

Effective January 1, 2018, we have adopted “Financial Accounting Standards Board (“FASB”) Accounting Standards Codification (“ASC”) 606 – *Revenue from Contracts with Customers* related to revenue recognition. Under the standard, revenue is recognized to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services using a five-step model to achieve that principle. In addition, the standard requires disclosures to understand the nature, amount, timing, and uncertainty of revenue and cash flows arising from contracts with customers. We have elected to adopt the modified retrospective method for transitioning this accounting standard which requires that the cumulative effect of applying the revenue standard to existing contracts be recorded as an adjustment to retained earnings. Based on our review of contracts that were not substantially completed on December 31, 2017, there was no impact to the opening retained earnings balance.

Deferred Revenue

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. We recognize deferred revenue as net sales after we have satisfied our performance obligations to the customer and all revenue recognition criteria are met.

Revenue Recognition – Installation of photovoltaic modules (“PV”) solar systems

We use standard contract templates to initiate sales with customers and determined that each project started during the year ended December 31, 2018 contains one performance obligation. Although the contract states multiple services which are capable of being distinct, they are considered a single integrated output to the customer which is customized for each customer. As such all the services promised within a contract are considered one performance obligation. We recognize revenue for installation of PV solar systems over time following the transfer of control to the customer which typically occurs as the PV solar system is being installed. If control transfers over time, revenue is recognized based on the extent of progress towards the completion of the performance obligation. The method utilized by us to measure the progress towards completion requires judgment and is based on the products and services provided. We utilize the input method to measure the progress of our contracts because it best depicts the transfer of assets to the customer which incurs as materials are consumed by the project. The input method measures the progress towards completion based on the ratio of costs incurred to date (“actual cost”) to the total estimated costs (“budget”) at completion of performance obligation. Revenue, including estimated fees, are recorded proportionally as costs are incurred. Costs to fulfill include materials, labor and/or subcontractors’ costs, and other direct costs. Indirect costs and costs to procure the panels, inverters, and other system miscellaneous costs needed to satisfy the performance obligation are excluded since the customer does not gain control of those items until delivered to the site. Including the costs of those items would overstate the extent of our performance.

Each project’s transaction price is included within the contract and although there is only one performance obligation, changes to the contract price could take place after fulfillment of the performance obligation. We have considered financing components on projects started during the year ended December 31, 2018 and elected the use of a practical expedient where an entity need not adjust the promised amount of consideration for the effects of a significant financing component if the entity expects, at contract inception, that the period between when the entity transfers a promised service to the customer and when the customer pays for that good or service will be one year or less. All receivables from projects are expected to be received within one year from project completion and there were no adjustments to the contract values.

Under ASC 606, we are required to recognize as an asset the incremental costs of obtaining a contract with a customer if those costs are expected to be recovered. We incur sales commissions that otherwise would not have been incurred if the contract had not been obtained. These costs are recoverable; however, we have elected the use of a practical expedient to expense these costs as incurred as the amortization period of the asset would be less than one year.

Revenue Recognition – Operations & Maintenance

We generally recognize revenue for standard, recurring commercial operations and maintenance services over time as customers receive and consume the benefits of such services, which typically include corrective maintenance, data hosting or energy/deck monitoring services for a period. These services are treated as stand-ready performance obligations and are satisfied evenly over the length of the agreement, so we have elected a time-based method to measure progress and recorded revenue using a straight-line method.

Revenue Recognition – Service & Warranty

Warranties for workmanship and roof penetration are included within each contract. These warranties cannot be purchased separately from the related services, are intended to safeguard the customer against workmanship defects and does not provide any incremental service to the customer. It is necessary for us to perform the specified tasks to provide assurance that the final product complies with agreed-upon specifications and likely do not give rise to a separate performance obligation. We will continue to account for any related warranties in accordance with ASC 460-10 and record an accrual for potential warranty costs at the completion of a project. Any services provided to a customer outside of warranties such as system inspections are recognized upon completion of the service.

Allowance for Doubtful Accounts

We maintain allowances for doubtful accounts for estimated losses resulting from the inability of our customers to make required payments. We estimate anticipated losses based on the expected collectability of all of our accounts receivable, which takes into account collection history, the number of days past due, identification of specific customer exposure and current economic trends. When we determine a balance is uncollectible and no longer actively pursue collection of the account, it is written off.

Inventory

Inventory for our Solar Division segments consists primarily of solar energy system components (such as photovoltaic modules and inverters) located at our warehouses and is stated at the lower of cost (first-in, first-out method) or net realizable value. We identify the inventory items to be written down for obsolescence based on the item's current sales status and condition. We write down discontinued or slow-moving inventories based on an estimate of the markdown to retail price needed to sell through our current stock level of the inventories on a quarterly basis.

POWERHOUSE™ inventories are recorded at the lower of cost (incurred from third party supply channel manufacturers) or net realizable value. Cost is determined using the first-in, first-out method. Management will establish an estimated excess and obsolete inventory reserve based on slow-moving and obsolete inventory. At December 31, 2018, there was no excess and obsolete inventory reserve.

Warranties

Currently, our standard manufacturing warranty for our POWERHOUSE™ solar shingle comes with a 11-year product warranty, which is the standard product warranty of most traditional solar panels today, and a 24-year power production warranty. We receive warranties from our supply chain matching the terms of the POWERHOUSE™ solar shingle warranty.

We warrant our EPC solar energy systems sold to customers for up to ten years against defects in installation workmanship. The manufacturers' warranties on the solar energy system components, which are typically passed through to the customers, typically have product warranty periods of 10 years and a limited performance warranty period of 25 years. We generally provide for the estimated cost of warranties at the time the related revenue is recognized. We also maintain specific warranty liabilities for large commercial customers. We assess the accrued warranty reserve regularly and adjust the amounts as necessary based on actual experience and changes in future estimates.

Goodwill and Purchased Intangibles

We review goodwill for impairment annually during the second quarter, or more frequently if a triggering event occurs between impairment testing dates. As a result of the annual impairment test, we fully impaired the goodwill balance charging an impairment loss to the consolidated statement of operations during the second quarter of 2018.

Up-front POWERHOUSE™ 3.0 license payments when incurred, costs to obtain UL certification and legal costs to acquire the License are initially capitalized and thereafter amortized to operations, commencing November 2018 after UL certification, on a straight-line basis over the expected life of the License through 2034.

Common Stock Warrants

We account for common stock warrants in accordance with applicable accounting guidance provided in FASB ASC 480, *Liabilities – Distinguishing Liabilities from Equity*, as either liabilities or as equity instruments depending on the specific terms of the warrant agreement. Certain of our warrants are accounted for as liabilities due to provisions either allowing the warrant holder to request redemption, at the intrinsic value of the warrant, upon a change of control, event of default or failure to deliver shares. We classify these warrant liabilities on the Condensed Consolidated Balance Sheet as current or long-term liabilities based on their expiration date. They are revalued at each balance sheet date after their initial issuance with changes in the value recorded in earnings. The Company used a Monte Carlo pricing model to value these warrant liabilities. The Monte Carlo pricing model, which is based, in part, upon unobservable inputs for which there is little or no market data, requires the Company to develop its own assumptions. The assumptions used on April 9, 2018, June 30, 2018, September 30, 2018 and December 31, 2018 to value the common stock warrant liabilities are as follows:

	<u>Exercise Price</u>	<u>Strike Floor</u>	<u>Closing Market Price (average)</u>	<u>Risk-free Rate</u>	<u>Dividend Yield</u>	<u>Market Price Volatility</u>	<u>Remaining Term (years)</u>
Warrant Liability April 09, 2018	\$ 1.12	\$ 0.97	\$ 0.85	2.60%	0.00%	120%	5.00
Warrant Liability June 30, 2018	\$ 0.55	\$ 0.19	\$ 0.57	2.72%	0.00%	115%	4.78
Warrant Liability September 30, 2018	\$ 0.32	\$ 0.19	\$ 0.39	2.93%	0.00%	115%	4.53
Warrant Liability December 31, 2018	\$ 0.32	N/a	\$ 0.52	2.49%	0.00%	120%	4.28

The Company also holds common stock warrants which have been classified in equity. Upon conversion of the warrants, the Company determines the fair value of the warrants exercised using the share price and records the impact to common stock and additional paid-in capital.

Derivatives

The 2018 Notes contained conversion features which have been accounted for in accordance with FASB ASC 815, *Derivatives and Hedging*. The conversion options were embedded within the 2018 Notes but have been separated as (i) their economic characteristics and risks did not clearly and closely relate to the 2018 Notes (ii) the 2018 Notes were not remeasured at fair value and (iii) a separate instrument with the same terms as the conversion options would be considered a derivative. The 2018 Notes also contained various redemption clauses (contingent) that met all the criteria of a derivative and were measured and recorded at fair value at the date of issuance and were revalued at each balance sheet date with changes in the value recorded in earnings.

We used a Lattice pricing model to value these derivative liabilities. The Lattice pricing model, which is based, in part, upon unobservable inputs for which there is little or no market data, requires us to develop its own assumptions. We classified these derivative liabilities on the Condensed Consolidated Balance Sheet as short-term liabilities since they had maturities of one year. When the conversion option was exercised, for accounting purposes both liabilities (i.e., the debt host and the separated derivative liability) were subject to extinguishment accounting. As such, a gain or loss upon extinguishment of the two liabilities equal to the difference between the recorded value of the liabilities and the fair value of the consideration issued to extinguish them was recorded. The assumptions used on April 9, 2018, June 30, 2018, September 30, 2018 and December 31, 2018 to value the derivative liabilities are as follows:

	Conversion Price	Closing Market Price (average)	Risk-free Rate	Dividend Yield	Market Price Volatility	Remaining Term (years)	Debt Yield	Soft Call Threshold	First Redemption Period	Second Redemption Period
Derivative Liability April 09, 2018	\$ 1.26	\$ 0.85	2.08%	0.00%	110%	1.00	60%	\$ 2.52	20%	25%
Derivative Liability June 30, 2018	\$ 0.55	\$ 0.57	2.23%	0.00%	130%	0.78	60%	\$ 2.52	20%	25%
Derivative Liability September 30, 2018	\$ 0.31	\$ 0.39	2.36%	0.00%	125%	0.53	60%	\$ 2.52	20%	25%
Derivative Liability December 31, 2018	\$ 0.31	\$ 0.52	2.45%	0.00%	90%	0.28	60%	\$ 2.52	20%	25%

Share-Based Compensation

We recognize compensation expense for share-based awards based on the estimated fair value of the award on the date of grant. We measure compensation cost at the grant date fair value of the award and recognize compensation expense based on the probable attainment of a specified performance condition for performance-based awards or over a service period for time-based awards. We use the Black-Scholes option valuation model to estimate the fair value for purposes of accounting and disclosures. In estimating this fair value, certain assumptions are used (see Note 11. Share-Based Compensation in Item 8 of the Financial Statements in this prospectus), including the expected life of the option, risk-free interest rate, dividend yield, volatility and forfeiture rate. The use of different estimates for any one of these assumptions could have a material impact on the amount of reported compensation expense. Expected volatilities were based on a value calculated using the historical stock price volatility. Expected life was based on the specific vesting terms of the option and anticipated changes to market value and expected employee exercise behavior. The risk-free interest rate used in the option valuation model was based on U.S. Treasury zero-coupon securities with remaining terms similar to the expected term on the options. RGS does not anticipate paying any cash dividends on its Common Stock in the foreseeable future and, therefore, an expected dividend yield of zero was used in the option valuation model. The assumptions used to value to 2018 Options as of December 31, 2018 are as follows:

2018 Non-Qualified Stock Options

Grant Date	Vesting Period	Expected Life	Expected Dividend Rate	Risk-free Rate	Market Price Volatility
June 21, 2018	2.78 years	4.2 years	0%	2.70%	148.77%
September 4, 2018	2.82 years	5.7 years	0%	2.78%	147.40%
September 10, 2018	2.81 years	5.7 years	0%	2.83%	146.66%
October 15, 2018	2.96 years	4.3 years	0%	2.96%	149.82%
October 29, 2018	2.92 years	4.3 years	0%	2.87%	150.34%

Income Taxes

We recognize income taxes under the asset and liability method. Deferred income taxes are recognized based on temporary differences between financial reporting and income tax bases of assets and liabilities, using current enacted income tax rates and regulations. These differences will result in taxable income or deductions in future years when the reported amount of the asset or liability is recovered or settled, respectively. Considerable judgment is required in determining when these events may occur and whether recovery of an asset, including the utilization of a net operating loss carry-forward prior to its expiration, is more likely than not. A valuation allowance is established if it is more likely than not that a deferred tax asset will not be realized. In determining the appropriate valuation allowance, we consider projected realization of tax benefits based on expected levels of future taxable income, available tax planning strategies, and our overall deferred tax position.

Results of Operations

Year Ended December 31, 2018 Compared to Year Ended December 31, 2017

POWERHOUSE™ Segment:

We received our first purchase order from a customer on December 27, 2018 and shipped to the customer in January 2019. Accordingly, we have no revenue during 2018 from POWERHOUSE™ and a backlog of one transaction. We commenced amortization of the POWERHOUSE™ license upon receiving UL approval on November 2, 2018 and have recorded two months of amortization expense of \$0.03 million.

Solar Division Segments:

Contract revenue:

Sale and installation of solar energy systems. Sale and installation of solar energy system revenue decreased \$2.5 million, or 17.9%, to \$11.5 million during the twelve months ended December 31, 2018, from \$14.0 million during the twelve months ended December 31, 2017. During the twelve months ended December 31, 2018, installations decreased 0.5 megawatts to 2.8 as compared to the 3.3 megawatts installed during the twelve months ended December 31, 2017. This decrease was primarily due to slower sales in the beginning of the year and a decline in our weighted average selling price per watt of 2.6%. Additionally, limitations including cutbacks of major incentive programs in Massachusetts and Rhode Island caused delays in the installation of our backlog in the fourth quarter of 2018 as approvals required for installation were not available. This delayed the installation of many projects in the fourth quarter, as Massachusetts and Rhode Island comprised a significant portion of our backlog in 2018. As previously disclosed, we are exiting our Mainland residential solar business.

Contract expenses:

Installation of solar energy systems. Installation of solar energy system expenses decreased \$1.9 million, or 14.5%, to \$11.2 million during the twelve months ended December 31, 2018, from \$13.1 million during the twelve months ended December 31, 2017, which corresponds to the reduction of installation revenue during this same time comparison. We utilize gross margin percentage to measure performance utilizing an internal time reporting system allowing us to measure both total incurred contract expense and contract expense excluding construction crew idle time. For the twelve months ended December 31, 2018, our residential segments gross margin without idle time declined due to a 2.6% decline in the average selling price per watt exceeding the 0.8% decline in the costs of installation per watt.

Customer acquisition. Customer acquisition expense decreased \$2.3 million during the twelve months ended December 31, 2018, or 38.9%, to \$3.6 million from \$5.9 million during the twelve months ended December 31, 2017. This decrease is primarily attributable to a reduction in workforce related to a targeted focus on increasing individual sales team member key performance indicators and a more selective hiring process allowed for significant improvements in lead performance. Our continued efforts to refine our digital lead development also played a large role in the decrease.

Operating expense: Operating expenses decreased \$1.0 million, or 9.2%, to \$9.8 million during the twelve months ended December 31, 2018 compared to \$10.8 million during the twelve months ended December 31, 2017, primarily due to a decrease in labor and legal fees.

Other Segment:

Goodwill impairment. Goodwill impairment increased by \$1.3 million during the year ended December 31, 2018 due to the results of our annual impairment testing. We concluded that the fair value of the goodwill no longer exceeded its carrying value and wrote off the goodwill balance.

Litigation and proxy contest expense. Litigation and proxy contest expenses during the twelve months ended December 31, 2018 was \$0.2 million compared to \$1.5 million during the twelve months ended December 31, 2017. The decrease of \$1.3 million is primarily attributable to nonrecurring proxy contest expenses of \$1.2 million in 2017. Our legal expenses may increase in subsequent periods. See Note 7. Commitments and Contingencies.

Change in fair value of derivative liabilities, loss on debt extinguishment and amortization of debt discount & deferred loan costs. The issuance of the 2018 Notes, subsequent conversions and revaluation of the derivative liabilities resulted in our recording derivative liabilities as disclosed in Note 9. Convertible Debt. Additionally, interest expense increased due to the accretion of the debt discount and deferred loan costs related to the 2018 Notes. No such transaction occurred during the year ended December 31, 2017.

Other (income) expenses. Other expenses primarily represent a gain on settlement of a long-term liability with a directors and officers liability insurance provider.

Liquidity and Capital Resources

Our historical operating results indicate substantial doubt exists related to our ability to continue as a going concern. Management's plans and actions, which are intended to mitigate the substantial doubt raised by our historical operating results in order to satisfy our estimated liquidity needs for a period of 12 months from the issuance of the consolidated financial statements, are discussed below. As we cannot predict, with certainty, the outcome of our actions to generate liquidity, or whether such actions would generate the expected liquidity as currently planned, management's plans to mitigate the risk and extend cash resources through the evaluation period, are not considered probable under current accounting standards for assessing an entity's ability to continue as a going concern.

As of December 31, 2018, we have cash of \$5.8 million, working capital of \$6.9 million, debt of \$0.3 million and shareholders' equity of \$10.8 million.

We have experienced recurring operating losses and negative cash flow from operations which have necessitated:

- Exiting the mainland residential division and execution of a reduction in workforce, see Note 16. Subsequent Events;
- Focusing on growing POWERHOUSE™ revenue through a re-allocation of personnel to POWERHOUSE™ sales and initiating sales to other solar installers and distribution companies; and
- Raising additional capital. See Note 8. Shareholders Equity and Note 16. Subsequent Events for transactions to raise capital during the second quarter of 2019.

No assurances can be given that we will be successful with our plans to grow revenue for profitable operations.

We have historically incurred a cash outflow from our operations as our revenue has not been at a level for profitable operations. As discussed above, a key component of our revenue growth strategy is the sale of our POWERHOUSE™ 3.0 in-roof solar shingle. We obtained UL certification for POWERHOUSE™ at the close of 2018 and therefore only recently begun to market POWERHOUSE™ at the start of 2019. We believe that we will require several quarters for us to generate sales to meet our goals for profitable operations.

The first quarter of the year has always been one of our slowest sales periods and as such, this is a period of higher cash outflow. POWERHOUSE™ 3.0 sales during the first quarter of 2019 have been materially less than our expectations and, accordingly, we raised additional capital during the second quarter of 2019.

Additionally, we have arranged with a third-party specialty lender to provide financing to our POWERHOUSE™ roofers for their purchases of POWERHOUSE™ in-roof shingles. Under this agreement, we are to be paid the next day after the roofers place a purchase order and, accordingly, when roofers avail themselves of this financing, we do not have accounts receivable, enhancing our cash flow from operations.

As discussed above, (i) we expect that future sales of POWERHOUSE™ 3.0 in-roof solar shingles will be our primary source of revenue and (ii) we only recently began marketing POWERHOUSE™ 3.0, and accordingly, we expect to incur a quarterly cash outflow for a portion of 2019. We have placed purchase orders with our supply chain partners for inventory to be converted to revenue.

The Company has prepared its business plan for the ensuing twelve months, which includes the following:

- Exit from the mainland residential division which historically has generated material cash outflows;
- Generate POWERHOUSE™ revenue through sales to local roofing companies, home builders and EPC companies;
- Convert current mainland residential backlog into revenue through authorized third-party integrators; and
- Increase sales and installations with commercial customers on the mainland and sales and installations of residential and commercial systems in Hawaii.

Cash Flows

The following table summarizes our primary sources (uses) of cash during the periods presented:

	2018	2017
Net cash (used in) provided by:		
Operating activities	(12,367)	(16,035)
Investing activities	(2,146)	(1,959)
Financing activities	19,174	16,224
Net increase (decrease) in cash	<u>\$ 4,661</u>	<u>\$ (1,770)</u>

Operating activities. Cash outflow from operations for the twelve-month period ended December 31, 2018 decreased \$3.7 million as compared to the twelve-month period ended December 31, 2017. This decrease in cash used in operations was primarily due to a reduction of \$2.3 million in our customer acquisition costs and a reduction in payroll costs corresponding to a reduction in personnel. Additionally, we collected on receivables from certain previously installed commercial projects and settled on litigation related to a large commercial project which released funds previously held in escrow.

Investing activities. During the year ended December 31, 2018, cash outflows for investing activities increased \$0.2 million as compared to the twelve-months ended December 31, 2017. We made payments to the Dow Chemical Company attributable to the License of \$2.0 million in 2018 and \$1.0 million in 2017. Additionally, in 2017 we had approximately \$0.8 million in capital expenditures.

Financing activities. Cash inflow from financing activities increased \$3.0 million to \$19.2 million in 2018 from \$16.2 million in 2017. The increase is due to capital raising activities in 2018 providing net cash inflows of \$19.2 million consisting of (i) \$9.9 million related to the 2018 Notes (ii) \$8.7 million related to exercise of warrants and (iii) \$1.8 million related to the January 2018 Offering less payments for transaction costs of \$1.2 million, as compared to cash inflows of \$17.5 million related to the February 2017 offerings discussed in Note 8. Shareholders' Equity. Additionally, in 2017 we paid \$1.0 million to close our revolving line of credit.

Off-Balance Sheet Arrangements

We have not participated in transactions that generate relationships with unconsolidated entities or financial partnerships, such as special purpose entities or variable interest entities, established for the purpose of facilitating off-balance sheet arrangements or other limited purposes.

MANAGEMENT

DIRECTORS

The following table sets forth the names and ages of our current directors:

Name	Age	Position
Ian Bowles	53	Director and Chairman
Dennis Lacey	65	Director and Chief Executive Officer
Pavel Bouska	65	Director
Robert L. Scott	72	Director

Each director serves for a one-year term. Biographical information for each director, including the years in which they began serving as directors and their positions with the Company, are set forth below.

IAN BOWLES—age 53—Chairman of the Company’s Board of Directors.

Mr. Bowles has served as a director since December 2013. He is Co-founder and Managing Director of WindSail Capital Group, a Boston-based investment firm providing growth capital to emerging clean energy companies; a position he has held since March 2011. Mr. Bowles is also Senior Director of Albright Stonebridge Group, a global strategy firm based in Washington, DC; a position he has held since February 2011. From January 2007 to January 2011, he served as Secretary of Energy and Environmental Affairs of Massachusetts, during which time he oversaw all aspects of energy and environmental regulation and policy in Massachusetts. Earlier in his career, Mr. Bowles served on the White House staff for President Bill Clinton, holding the posts of Senior Director of Global Environmental Affairs at the National Security Council and Associate Director of the White House Council on Environmental Quality.

Our Board of Directors believes that Mr. Bowles brings significant strategic focus, regulatory and public policy expertise and financial and industry experience.

DENNIS LACEY—age 65—Director and Chief Executive Officer.

Mr. Lacey joined the Company in February 2014 as Senior Vice President Finance and became the President of our Residential Solar Division in April 2014 and our Chief Executive Officer and a director in August 2014. Mr. Lacey also served as our acting Principal Financial Officer from October 2014 to February 2017. He brings to his role as Chief Executive Officer more than 25 years of executive financial management experience. Before joining RGS, Mr. Lacey served as the Chief Financial Officer of Community Enhancement Group REIT, Inc., formed to invest in multi-family properties and acquire REIT status, between May 2012 and February 2014. Between January 2010 and March 2012, Mr. Lacey served as Chief Financial Officer and Vice President of Stream Global Services, a publicly-traded company providing business process outsourcing services. Between September 2006 and December 2009, he was the head of capital markets for Republic Financial Corporation, a private investment firm engaged in aircraft leasing and alternative asset management. Before that, Mr. Lacey held a number of senior executive positions at Imperial Bancorp, a \$6 billion publicly-traded commercial bank best known for its high-tech lending practice before it was acquired by Comerica. At Imperial Bancorp, he served as Executive Vice President and Chief Financial Officer, President of the SBA Division, and President of the Equipment Leasing Division. Mr. Lacey also served as President and Chief Executive Officer of Capital Associates, a publicly traded equipment leasing company. He previously served as Chief Financial Officer of two multi-billion dollar publicly-traded companies: TeleTech Holdings, Inc., one of the largest customer experience management companies in the United States, and CKE Restaurants, Inc., an owner, operator and franchisor of popular brands in the quick-service restaurant industry. Earlier in his career, Mr. Lacey was an audit partner at Coopers & Lybrand, an accounting firm.

Our Board of Directors believes that Mr. Lacey brings significant senior leadership management, operational and financial experience.

PAVEL BOUSKA—age 65—Director.

Mr. Bouska has served as a director since September 2012. Mr. Bouska has been an independent business consultant since 2006. From 2003 to 2006, he was the Chief Executive Officer and served as a director of ionSKY Inc., a wireless Internet service provider. Between 1999 and 2003, Mr. Bouska served as Executive Vice President and Chief Information Officer of Gaia, Inc. (formerly known as Gaiam, Inc.), as Chief Executive Officer of Gaiam Energy Tech, Inc., the renewable energy division of Gaia that later became Real Goods Solar, and as a director of Gaiam.com, Inc., an e-commerce subsidiary of Gaia. In addition, Mr. Bouska served as a director of Gaia between 1991 and 1999. From 1988 to 1999, he served as Chief Information Officer and Vice President, Information Technology of Corporate Express, Inc., a corporate supplier, as it grew from \$2.0 million of gross revenues to a Fortune 500 company. From 1985 to 1988 Mr. Bouska worked as project leader at sd&a software company in Munich, Germany. He has experience with organization management and technology deployment in rapidly growing and changing environments, business unit integrations, and mergers and acquisitions. From 2002 to 2012, Mr. Bouska has also served as President and chairman of the Board of Sunshine Fire Protection District in Boulder, Colorado.

Our Board of Directors believes that Mr. Bouska brings significant senior leadership, strategic focus, business development, and renewable energy experience.

ROBERT L. SCOTT—age 72—Director.

Mr. Scott has served as a director since June 2012. Mr. Scott has advised and assisted a number of companies since retiring as a partner from Arthur Andersen, LLP. From May to November 2009, he served as the interim Chief Financial Officer of Square Two Financial (formerly, Collect America), a private consumer debt company, assisting them with financial administration and transition to a permanent Chief Financial Officer. From 2004 to 2008, Mr. Scott assisted Colorado Mountain Development, engaged in retail land sales primarily in Texas, to improve financial reporting and accounting systems and help transition toward the sale and relocation of the business. During 2003 and 2004, Mr. Scott served as a consultant to KRG Capital Partners, LLC, a Denver-based private equity firm, assisting them with due diligence investigations of certain target companies. Mr. Scott joined Arthur Andersen, LLP, a public accounting firm, in 1970 and was admitted as partner in 1981, continuing through his retirement in 2002. Within Arthur Andersen's Audit & Business Advisory Group, Mr. Scott served clients in numerous life cycle stages and industries including construction, venture capital, energy exploration and development, manufacturing, cable and satellite television, software development, real estate and manufacturing.

Our Board of Directors believes that Mr. Scott brings exceptional technical skills in accounting, internal controls, taxation, equity compensation, and public company matters.

EXECUTIVE OFFICERS

The following table sets forth the names and ages of our current executive officers:

<u>Name</u>	<u>Age</u>	<u>Position</u>
Dennis Lacey	65	Chief Executive Officer and Director
Alan Fine	65	Chief Financial Officer and Chief Administrative Officer
Nicolle Dorsey	40	Principal Accounting Officer and Controller

Our executive officers are appointed annually by our Board of Directors. Biographical information about Mr. Lacey is included herein under the heading "DIRECTORS."

ALAN FINE—age 65—Mr. Fine joined the Company in July 2014 as the Director of Commercial Accounting and Finance, was appointed the Company's Treasurer and Principal Accounting Officer in October 2014 and was later appointed the Company's Principal Financial Officer in February 2016, while continuing to serve as the Company's Treasurer. In September 2017, he was named the Company's Chief Financial Officer and Chief Administrative Officer. Before joining the Company, he served as the Chief Financial Officer and Principal Accounting Officer of Roomlinx, Inc., a public company engaged in in-room guest entertainment systems servicing the hospitality industry, between August 2011 and June 2014. From May 2008 to June 2011, Mr. Fine served as the Chief Financial Officer and Director of Operations for Pearlstine Distributors, a privately held distributor of Anheuser Busch, Samuel Adams, Heineken, New Belgium and other craft beers to the Charleston, South Carolina market. From November 1997 to May 2000, he served as the Vice President of Finance at Colorado Greenhouse, an international producer of hydroponic tomatoes. Before that, Mr. Fine served as the Chief Financial Officer of Gold Coast Beverage Distributors, a beer and water wholesaler serving Southern Florida, from May 1994 to July 1997. Mr. Fine has a Bachelor of Science degree in accounting from Loyola College of Maryland, a bachelor of science degree in civil engineering from UMASS, Lowell and is a licensed certified public accountant in Pennsylvania.

NICOLLE DORSEY—age 40—Ms. Dorsey joined the Company in September 2016 as Assistant Controller before she was named the Company's Principal Accounting Officer and Controller in September 2017. Before joining the Company, she worked for Cloud Peak Energy, a publicly held coal producing company, from April 2014 to March 2016. Prior to that Ms. Dorsey worked in public accounting, auditing and performing compliance work for energy sector clients. Ms. Dorsey has a BBA degree in accounting and a Master of Accountancy from the University of Wisconsin and is a licensed certified public accountant in Colorado.

EXECUTIVE COMPENSATION

Summary Compensation Table

The following table includes information concerning compensation for each of the last two completed fiscal years for our principal executive officer, and the other named executive officers of our company.

Name and Principal Position	Year	Salary	Option	Totals
			Awards (1)	
Dennis Lacey	2018	\$ 375,972	\$ 211,600	\$ 587,572
Chief Executive Officer and Director	2017	\$ 375,000	\$ -	\$ 375,000
Alan Fine	2018	\$ 191,346	\$ 85,800	\$ 277,146
Chief Financial Officer and Chief Administrative Officer	2017	\$ 185,000	\$ -	\$ 185,000
Nicolle Dorsey (2)	2018	\$ 127,914	\$ 42,600	\$ 170,514
Principal Accounting Officer and Controller	2017	\$ 100,346	\$ -	\$ 100,346

- (1) The amounts in the *Option Awards* column reflect the aggregated grant date fair value of awards granted during 2018 and 2017, all of which were computed in accordance with FASB ASC Topic 718. Assumptions used in the calculation of the aggregated grant date fair value for these options are included in Note 11. Share-Based Compensation to our audited financial statements, included in Item 8 of the Financial Statements in this prospectus. The terms of the options are described under the Outstanding Equity Awards at Fiscal Year-End Table below. The Company did not grant any option awards to its named executive officers during 2017.
- (2) Ms. Dorsey commenced service as our Principal Accounting Officer and Controller on September 21, 2017.

Outstanding Equity Awards at Fiscal Year-End

The following table includes certain information with respect to unexercised options previously awarded to our executive officers named above in the Summary Compensation Table and outstanding as of December 31, 2018.

Name	Option Awards			
	Number of Securities Underlying Unexercised Options (1)		Option Exercise Price (1)	Option Expiration Date (1)
	Exercisable	Unexercisable		
Dennis Lacey	12	-	\$ 45,120	2/28/2021
	4	-	\$ 26,520	7/17/2021
	25	-	\$ 24,720	8/18/2021
	24	10 ⁽²⁾	\$ 1,428	6/1/2022
	47,500	142,500	\$ 1.08	6/21/2025
Alan Fine	1,667	18,333	\$ 0.32	10/15/2025
	1	-	\$ 31,800	7/7/2021
	2	-	\$ 14,760	10/19/2021
	5	-	\$ 1,428	6/1/2022
Nicolle Dorsey	18,750	56,250	\$ 1.08	6/21/2025
	1,250	13,750	\$ 0.32	10/15/2025
	8,750	26,250	\$ 1.08	6/21/2025
	1,250	13,750	\$ 0.32	10/15/2025

- (1) The exercise price of the options is equal to the closing stock market price of our Common Stock on the date of grant and the options expire seven years from the date of grant except as noted. For further information, see Note 11. Share-Based Compensation to our audited financial statements, included in Item 8 of the Financial Statements in this prospectus. Except as expressly noted, the unexercisable options vest in 8.3% equal quarterly installments on the last day of each calendar quarter following the grant, contingent on continuous employment.
- (2) 25% of the options vested immediately upon grant, and the remaining 75% subsequently vest in equal quarterly installments of 5% following the grant.

Generally Available Benefit Programs

We maintain a tax-qualified 401(k) Plan, which provides for broad-based employee participation. Our executive officers are eligible to participate in the 401(k) Plan on the same basis as other employees. Effective January 1, 2019, the Company will match 100% of employee contributions up to 3% of salary plus 50% of employee contributions greater than 3% but not to exceed 5% of salary. We do not provide defined benefit pension plans or defined contribution retirement plans to our executives or other employees other than our 401(k) Plan described herein.

During 2018, our named executive officers were eligible to receive the same health care coverage that was generally available to our other employees. Our benefit programs include medical, dental and vision insurance, long-term and short-term disability insurance, life and accidental death and dismemberment insurance, health and dependent care flexible spending accounts, business travel insurance, wellness programs (including chiropractic, massage therapy, acupuncture, and fitness classes), relocation/expatriate programs and services, educational assistance, and certain other benefits.

Our Compensation Committee believes that our 401(k) Plan and contribution matching and the other generally available benefit programs allow us to remain competitive for employee talent, and that the availability of the benefit programs generally enhances employee productivity and loyalty to us. The main objectives of our benefits programs are to give our employees access to quality healthcare, financial protection from unforeseen events, assistance in achieving retirement financial goals, and enhanced health and productivity, in full compliance with applicable legal requirements. Typically, these generally available benefits do not specifically factor into decisions regarding an individual executive officer's total compensation or 2018 Long-Term Incentive Plan award package.

Stock Option Grant Timing Practices

Our Compensation Committee administers and grants awards under our 2018 Long-Term Incentive Plan and has granted to our chief executive officer the authority to make awards to our employees that do not report directly to the chief executive officer. During fiscal 2018, our chief executive officer, Compensation Committee and Board of Directors consistently applied the following guidelines for stock option grant timing practices:

- *New Employees*: stock option grants to new hires are effective on the first day of the new employee's employment with us or upon approval by our chief executive officer, Compensation Committee or Board of Directors, as applicable, and the exercise price for the options is set at the closing price of our Common Stock on that date.
- *Existing Employees*: stock option grants to existing employees are effective on the date that our chief executive officer, Compensation Committee or Board of Directors, as applicable, approves the grant, and the exercise price for the options is set at the closing price of our Common Stock on that date.

Employment Agreements and Compensation of our Named Executive Officers

On June 1, 2015, we entered into a written employment agreement with Dennis Lacey, outlining the terms of his employment as our Chief Executive Officer. We entered into an amendment to the employment agreement on November 19, 2018 to increase the severance payment Mr. Lacey is eligible for if his employment with the Company is terminated without Cause (as defined in the employment agreement) within 12 months after a Change of Control (as defined in the employment agreement) or if Mr. Lacey terminates his employment for "Good Reason" (as defined in the employment agreement). Pursuant to the terms of the employment agreement, Mr. Lacey will receive an initial annual base salary of \$375,000. Our Board of Directors may, in its sole discretion, adjust his base salary but may not reduce the base salary unless such reduction is done in connection with a broad reduction of compensation of our management.

For each fiscal year, Mr. Lacey is eligible for an annual performance bonus of up to 100% of his base salary, subject to such terms and conditions and upon achievement of performance targets as determined by the Board of Directors or a committee created by its Board of Directors. Mr. Lacey must be an employee on the date a performance bonus is to be paid to be eligible to receive it. We did not pay Mr. Lacey any bonuses for 2016, 2017 or 2018.

Mr. Lacey is eligible to participate in the Company's 401(k) plan and is eligible for expense reimbursement for business expenses incurred in connection with his duties under his employment agreement. Mr. Lacey is also eligible for coverage under group insurance plans and to receive fringe benefits made available to the Company's executive and management employees. The Company will pay the premiums for coverage of Mr. Lacey and his dependents under such insurance plans.

The term of the employment agreement continues until terminated and may be terminated as described below and (i) by mutual agreement between the parties, (ii) automatically, upon Mr. Lacey's death or disability, (iii) by Mr. Lacey for any or no reason upon 30 days' prior written notice, and (iv) by the Company for "cause," as discussed below, effective immediately. If terminated in this manner, the Company will pay to Mr. Lacey any accrued but unpaid base salary, accrued but unused vacation and reimbursable business expenses and Mr. Lacey is not entitled to any severance benefits. "Cause" is defined as Mr. Lacey (i) violating in any material respect any term of the employment agreement or a nondisclosure agreement entered into with the Company in 2014, (ii) violating any Company policy, procedure or guideline that results in material harm to the Company, (iii) acting with gross negligence in the performance of his duties resulting in harm to the Company, (iv) engaging in any of the following forms of misconduct: commission of any felony or any misdemeanor involving dishonesty or moral turpitude; theft or misuse of Company's property; illegal use or possession of any controlled substance; discriminatory or harassing behavior, whether or not illegal under federal, state or local law; or falsifying any document or making any materially false or misleading statement relating to his employment, or (v) failing to cure, within 30 days, any material injury to the economic or ethical welfare of the Company caused by his malfeasance, gross misconduct or material inattention to his duties and responsibilities under the employment agreement (such cure right being limited to one occurrence unless otherwise agreed to by the Board of Directors).

In addition to the foregoing, if the Company terminates Mr. Lacey's employment without "cause," Mr. Lacey is entitled to severance compensation equal to 12 months of his most recent base salary, which shall be payable in equal installments in accordance with the Company's standard payroll practice. However, if the Company terminates Mr. Lacey's employment within 12 months after the consummation of a change of control (as defined in the employment agreement and as discussed below), such severance payment shall equal 24 months of Mr. Lacey's most recent base salary plus 200% of the maximum performance bonus that Mr. Lacey may earn for such fiscal year and shall be payable in one lump sum within 30 calendar days after termination of employment. A "change of control" means any transaction or series of related transactions (i) the result of which is that any person or persons controlling, controlled by or under common control with such person becomes the beneficial owner of more than 50% of the issued and outstanding Company voting stock (including securities convertible or exercisable for voting stock), (ii) that results in the sale of all or substantially all of the Company's assets, or (iii) that results in a consolidation or merger whereby the Company is not the surviving entity. Mr. Lacey's receipt of severance compensation is conditioned on his executing release and confidentiality agreements as further described in the employment agreement.

Furthermore, subject to notice and cure periods, Mr. Lacey may terminate the employment agreement for "good reason" if, without Mr. Lacey's prior consent, (i) the Company materially breaches its obligations under the employment agreement, (ii) following a change of control, the successor company fails to assume the Company's obligations under the employment agreement, or (iii) within 12 months after a change of control, (A) Mr. Lacey is no longer the Chief Executive Officer of the surviving company, (B) his duties are materially altered or his authority is materially diminished, (C) his employment-related benefits are materially diminished, or (D) the Company's principal executive offices are moved more than 25 miles from their current location. A termination for "good reason" is deemed to be a termination by the Company without "cause."

On May 31, 2015 and in connection with entering into the employment agreement, our Board of Directors granted Mr. Lacey options to purchase 34 shares of the Company's Common Stock at an exercise price of \$1,428 per share under the Incentive Plan. At the time of grant, 25% of the options immediately vested and the remaining 75% subsequently vest in equal quarterly installments of 5% following the grant. The options awarded to Mr. Lacey include the following terms and conditions:

- The options expire on the seventh anniversary of the effective date of the applicable stock option grant and may not be exercised after the close of business on the applicable expiration date;
- The options vest at a rate of 5.0% on the last day of each calendar quarter occurring after the effective date of the applicable grant so long as the grantee has been continuously employed from the effective date of grant through the applicable vesting date;
- All of the unvested shares will vest immediately prior to the consummation of a change in control (which definition is substantively the same as the description of the definition of change of control in the employment agreement), provided that the grantee is an employee on the date the change in control is consummated;
- Vesting ceases on the date the grantee ceases to be an employee;
- Following the last day of employment, vested options may be exercised at any time during the lesser of (i) 30 days starting the day after the last date of employment, or (ii) the remaining term of the options; provided that if termination occurs (A) due to death or disability while grantee is employed, the options may be exercised at any time during the lesser of (1) one year starting the day after the last date of employment, or (2) the remaining term of the options, or (B) due to retirement, the option may be exercised at any time during the lesser of (1) the three month period commencing on the first day after the employee's last day of employment, or, if employee dies during the three month period commencing on the first day after employee's last day of employment, then the one year period commencing on the first day after the employee's last day of employment with RGS, or (2) the remaining term of the option; and
- In connection with their receipt of stock options under the Employee Stock Option Agreement, employees agree to be subject to typical non-disparagement, confidentiality and non-compete provisions.

On November 14, 2018, we entered into change in control agreements (the "Change in Control Agreements") with certain executive officers, employees that report directly to the Company's Chief Executive Officer and certain other employees considered to be part of the Company's senior leadership, including with each of Mr. Fine and Ms. Dorsey. The Change in Control Agreements are in substantially the same form and provide that in the event a Change in Control (as defined below) occurs, and either (i) any successor to the Company as a result of a Change in Control fails to assume the Company's obligations under the applicable Change in Control Agreement, or (ii) within the one-year period immediately following the consummation of the Change in Control, the subject employee's employment with the Company is (a) involuntarily terminated by the Company without Business Reasons (as defined in the Change in Control Agreement) or (b) voluntarily terminated by the subject employee for Good Reason (as defined in the Change in Control Agreement), then such employee shall receive a lump sum severance payment equal to a percentage of the sum of his or her base salary plus target bonus for the year in question. Mr. Fine's and Ms. Dorsey's percentage is 100%. The Change in Control Agreements were approved to promote the incentive employees to stay with the Company during and after a potential future change in control transaction to promote shareholders' interests and preserve value.

A "change in control" is defined in the Change in Control Agreements as a single transaction or a series of related transactions of any one or more of the following (subject to some exceptions): (i) any merger, consolidation or business combination of the Company with or into any other entity or person, or any other reorganization, in each case in which the equity holders of the Company immediately prior to such merger, consolidation, business combination or reorganization, own less than 50% of the voting power of the surviving entity immediately after such merger, consolidation, business combination or reorganization, (ii) any transaction in which in excess of 50% of the Company's voting power is transferred to a person or a group other than the equity holders of the Company immediately prior to such transaction(s), or (iii) a sale or other disposition of all or substantially all of the assets of the Company.

Other than as described above, we have not entered into traditional employment agreements or change in control agreement with any other named executive officers. Generally, those named executive officers who have been granted stock options, are subject to covenants concerning confidentiality, non-competition, non-solicitation of employees and customers and assignment of inventions contained in our standard form of stock option agreement executed upon grant.

Potential Payments Upon Termination or Change-in-Control

Pursuant to the terms of the employment agreement with Mr. Lacey and the Change in Control Agreements with Mr. Fine and Ms. Dorsey, each is entitled to receive the severance payments in the amount and pursuant to the terms described above in “Employment Agreements and Compensation for our Named Executive Officers.”

Our standard form of stock option agreement provides that option vesting ceases upon termination of employment. A former employee may exercise vested options (i) within 30 days (generally), (ii) within three months (upon retirement at or after normal retirement age) or (iii) within one year (upon termination due to death or disability or (iv) within one year (after a change of control) after termination, but in no event after the expiration term of the applicable option. Additionally, 100% of unvested options immediately vest upon the occurrence of a change of control.

Accounting and Tax Considerations

In designing our compensation programs, we take into consideration the accounting and tax effect that each element will or may have on us and our executive officers and other employees. We aim to keep the expense related to our compensation programs as a whole within certain affordability levels. When determining how to apportion between differing elements of compensation, our goal is to meet our objectives while maintaining relative cost neutrality. For instance, if we increase benefits under one program resulting in higher compensation expense, we may seek to decrease costs under another program in order to avoid a compensation expense that is above the level then deemed affordable under existing circumstances. For options, we recognize a charge to earnings for accounting purposes equally from the grant date until the end of the vesting period.

We believe we have structured our compensation program to comply with Internal Revenue Code Sections 162(m) and 409A. Under Section 162(m), a limitation is placed on tax deductions of any publicly-held corporation for individual compensation to certain executives of such corporation exceeding \$1 million in any taxable year. If an executive is entitled to nonqualified deferred compensation benefits that are subject to Section 409A, and such benefits do not comply with Section 409A, then the benefits are taxable in the first year they are not subject to a substantial risk of forfeiture. In such case, the service provider is subject to regular federal income tax, interest and an additional federal income tax of 20% of the benefit includible in income. We do not believe we have individuals with non-performance based compensation paid in excess of the Internal Revenue Code Section 162(m) tax deduction limit.

Director Compensation Policy

During 2018, directors who were not employees of our company or its affiliates were paid an annual retainer of \$20,000 plus fees of \$1,000 for each in-person board meeting attended, \$200 for each telephonic board meeting attended, \$500 for each committee meeting attended and \$200 for each telephonic committee meeting attended. Members of each standing committee receive an annual fee of \$4,000 and chairpersons of each standing committee receive an annual fee of \$10,000.

Director Compensation Table

The following table provides compensation information for the year ended December 31, 2018 for each director who served during 2018 and was compensated for his or her service other than as a named executive officer.

Name	Fees Earned or Paid in Cash	Option Awards (1)	Totals
Ian Bowles	\$ 50,600	\$ 50,200	\$ 100,800
Robert L. Scott	\$ 44,600	\$ 50,200	\$ 94,800
Pavel Bouska	\$ 30,200	\$ 50,200	\$ 80,400

- (1) The amounts in the *Option Awards* column reflect the aggregated grant date fair value of awards granted during 2018 and 2017, all of which were computed in accordance with FASB ASC Topic 718. Assumptions used in the calculation of the aggregated grant date fair value for these options are included in Note 11. Share-Based Compensation to our audited financial statements, included in Item 8 of the Financial Statements in this prospectus. All directors have 50,008 option awards outstanding as of December 31, 2018.

BENEFICIAL OWNERSHIP OF SHARES

The following table sets forth information with respect to the beneficial ownership of our Common Stock as of April 11, 2019 (except as noted) for (i) each person (or group of affiliated persons) who, insofar as we have been able to ascertain, beneficially owned more than 5% of the outstanding shares of our Common Stock, (ii) each director, (iii) each executive officer named in the Summary Compensation Table above, and (iv) all current directors and executive officers as a group. As of April 11, 2019, there were 108,902,754 shares of our Common Stock and no shares of our Class B common stock outstanding.

Name and Address of Beneficial Owner	Amount and Nature of Beneficial Ownership (1)	Percent of Class
Hudson Bay Capital Management LP (2)	8,961,318	7.81%
Intracoastal Capital, LLC (3)	8,942,342	7.80%
Dennis Lacey (4)	436,662	*
Alan Fine (5)	122,478	*
Nicolle Dorsey (6)	14,150	*
Pavel Bouska (7)	35,829	*
Ian Bowles (8)	165,830	*
Robert L. Scott (9)	65,825	*
All directors and executive officers as a group (6 persons) (10)	840,774	0.91%

* Indicates less than 1% ownership.

- (1) This table is based upon information supplied by officers, directors and principal shareholders directly to the Company or on Schedules 13D and 13G and Forms 3, 4 and 5 filed with the SEC. All beneficial ownership is direct and the beneficial owner has sole voting and investment power over the securities beneficially owned unless otherwise noted. Share amounts and percent of class include stock options exercisable and restricted stock vesting within 60 days after April 11, 2019.
- (2) According to information available to the Company, consists of (i) 3,055,657 shares of our Common Stock; (ii) 2,503,516 shares of our Common Stock issuable upon exercise of warrants that are currently exercisable (subject to a 4.99% beneficial ownership limitation); and (iii) 3,402,145 shares of our Common Stock issuable upon exercise of warrants that are currently exercisable (subject to a 9.99% beneficial ownership limitation), which together represent 7.81% of our outstanding shares of Common Stock as of April 11, 2019. Does not include additional shares of Common Stock issuable upon exercise of additional warrants because the holder does not have the right to receive such shares if the holder, together with certain attribution parties, would beneficially own in excess of 4.99% of the outstanding shares of our Common Stock. Hudson Bay Capital Management LP, the investment manager of Hudson Bay Master Fund Ltd., has voting and investment power over these securities. Sander Gerber is the managing member of Hudson Bay Capital GP LLC, which is the general partner of Hudson Bay Capital Management LP. Hudson Bay Capital Management LP may be deemed to be the beneficial owner of all shares of Common Stock underlying the securities held by Hudson Bay Master Fund Ltd. Mr. Gerber disclaims beneficial ownership of these securities. The address of Hudson Bay Master Fund Ltd. is c/o Hudson Bay Capital Management LP, 777 Third Avenue, 30th Floor, New York, NY 10017.

- (3) According to a Schedule 13G filed April 11, 2019 by Intracoastal Capital LLC (“Intracoastal”), Mitchell P. Kopin and Daniel B. Asher and information available to the Company. Consists of (i) 3,255,658 shares of our Common Stock; and (ii) 5,686,640 shares of our Common Stock issuable upon exercise of warrants that are currently exercisable (subject to a 9.99% beneficial ownership limitation), which together represent 7.72% of our outstanding shares of Common Stock as of April 11, 2019. Does not include additional shares of Common Stock issuable upon exercise of additional warrants because the holder does not have the right to receive such shares if the holder, together with certain attribution parties, would beneficially own in excess of 4.99% of the outstanding shares of our Common Stock. The reporting persons share voting and dispositive power over the shares. Mr. Kopin and Mr. Asher, each of whom are managers of Intracoastal, share voting control and investment discretion over the securities held by Intracoastal. As a result, each of Mr. Kopin and Mr. Asher may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities held by Intracoastal. The address of Intracoastal and Mr. Kopin is 245 Palm Trail, Delray Beach, FL 33483. The address of Mr. Asher is 111 W. Jackson Boulevard, Suite 2000, Chicago, IL 60604.
- (4) Consists of (i) 170,000 shares of our Common Stock owned by Mr. Lacey, (ii) 155,000 shares of our Common Stock owned by a limited partnership, of which Mr. Lacey and his spouse are each a general partner and a limited partner, over which Mr. Lacey shares voting and investment power with his spouse, (iii) 45,000 shares of our Common Stock owned by Mr. Lacey’s spouse, (iv) 49,232 shares of our Common Stock issuable upon exercise of stock options that are currently exercisable and (v) 17,430 share of our Common Stock issuable upon exercise of stock options exercisable within 60 days after April 11, 2019.
- (5) Consists of (i) 95,000 shares of our Common Stock, (ii) 20,008 shares of our Common Stock issuable upon exercise of stock options that are currently exercisable and (iii) 7,470 share of our Common Stock issuable upon exercise of stock options exercisable within 60 days after April 11, 2019.
- (6) Consists of (i) 10,000 shares of our Common Stock issuable upon exercise of stock options that are currently exercisable and (iii) 4,150 share of our Common Stock issuable upon exercise of stock options exercisable within 60 days after April 11, 2019.
- (7) Consists of (i) 20,004 shares of our Common Stock, (ii) 11,675 shares of our Common Stock issuable upon exercise of stock options that are currently exercisable and (iii) 4,150 share of our Common Stock issuable upon exercise of stock options exercisable within 60 days after April 11, 2019.
- (8) Consists of (i) 150,005 shares of our Common Stock, (ii) 11,675 shares of our Common Stock issuable upon exercise of stock options that are currently exercisable and (iii) 4,150 share of our Common Stock issuable upon exercise of stock options exercisable within 60 days after April 11, 2019.
- (9) Consists of (i) 50,000 shares of our Common Stock, (ii) 11,675 shares of our Common Stock issuable upon exercise of stock options that are currently exercisable and (iii) 4,150 share of our Common Stock issuable upon exercise of stock options exercisable within 60 days after April 11, 2019.
- (10) Includes Messrs. Lacey, Fine, Dorsey, Bouska, Bowles, and Scott.

CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS

Related Party Transactions

The following is a description of certain transactions involving us and persons who are considered “related persons,” as such term is defined in Item 404 of Regulation S-K.

Transactions with Hudson Bay

We believe that Hudson Bay Master Fund, Ltd. (“Hudson Bay”) currently is a “related person” as a result of being the beneficial owner of more than 5% of our outstanding Common Stock. In addition, we believe that Hudson Bay either was a “related person” at the time of, or became a “related person” as a result of, entering into the transactions listed below.

On April 1, 2016, we sold \$6.0 million in principal amount of 2016 Notes and Series G Warrants to purchase 4,980 shares of our Common Stock to Hudson Bay as part of the April 2016 Offering. As a result of the purchase of the 2016 Notes, Hudson Bay became the beneficial owner of up to 9.99% of our outstanding Common Stock. The 2016 Notes bore interest at 8% per annum (or 18% per annum during an event of default). As of April 1, 2019, the maturity date of the 2016 Notes, we have converted into shares of our Common Stock \$5,999,000 in principal and \$274,395 in accrued interest owed to Hudson Bay. As a result, we have issued an aggregate of 334,303 shares of our Common Stock to Hudson Bay. The largest amount of principal outstanding since January 1, 2017 and the date of this prospectus was \$124,000. On April 1, 2019, we made a payment of \$1,281.02 to pay off the outstanding principal balance and related accrued interest under the 2016 Notes.

On February 6, 2017, we sold an aggregate of \$2.6 million of units to Hudson Bay as part of a registered offering of an aggregate amount of \$11.5 million of (i) “primary units” consisting of one share of our Common Stock, and a Series K warrant to purchase one share of our Common Stock and (ii) “alternative units” consisting of a prepaid Series L warrant to purchase one share of our Common Stock, and a Series K Warrant to purchase one share of Common Stock (the “February 6, 2017 Offering”). We sold the primary units at an initial purchase price of \$3.10 per unit and the alternative units at an initial purchase price of \$3.09 per unit. Hudson Bay purchased 290,323 primary units and 547,146 alternative units. As a result of the February 6, 2017 Offering, Hudson Bay received an aggregate of 290,323 shares of our Common Stock, a Series K warrant to purchase 837,469 shares of our Common Stock and a Series L warrant to purchase 547,146 shares of our Common Stock.

On February 9, 2017, we sold an aggregate of \$2.7 million of units to Hudson Bay as part of a registered offering of an aggregate amount of \$6.0 million of (i) “primary units” consisting of one share of our Common Stock, and a Series M warrant to purchase 75% of one share of our Common Stock, and (ii) “alternative units” consisting of a prepaid Series N warrant to purchase one share of our Common Stock, and a Series M Warrant to purchase 75% of one share of Common Stock (the “February 9, 2017 Offering”). We sold the primary units at an initial purchase price of \$2.50 per unit and the alternative units at an initial purchase price of \$2.49 per unit. Hudson Bay purchased 500,000 primary units and 600,000 alternative units. As a result of the February 9, 2017 Offering, Hudson Bay received an aggregate of 500,000 shares of our Common Stock, a Series M warrant to purchase 825,000 shares of our Common Stock, and a Series N warrant to purchase 600,000 shares of our Common Stock.

On January 4, 2018, we sold (i) 800,000 shares of Common Stock, (ii) a prepaid Series P Warrant to purchase 800,000 shares of Common Stock, and (iii) a Series O Warrant to purchase 1,600,000 shares of Common Stock to Hudson Bay for aggregate gross proceeds of approximately \$1.8 million in connection with the January 2018 Offering. We sold the shares of Common Stock at a purchase price of \$1.15 per share, and the share of Common Stock underlying the Series P Warrant at a purchase price of \$1.14 per share.

On April 9, 2018, we sold \$3,225,000 in principal amount and \$3 million funding amount (reflecting \$225,000 of original issue discount) of 2018 Notes and Series Q Warrants to purchase 2,781,137 shares of our Common Stock to Hudson Bay as part of the April 2018 Offering. The 2018 Notes do not bear interest other than upon the occurrence of an event of default, in which case the 2018 Notes bear interest at 18% per year. As of April 9, 2019, the maturity date of the 2018 Notes, we have converted into shares of our Common Stock \$3,199,800 in principal, \$5,249,145 of Additional Amount (as defined in the Series A Notes) and \$3,132,508 of Additional True-Up Amount (as defined in the Series B Notes). As a result, we have issued an aggregate of 24,099,375 shares of Common Stock to Hudson Bay. The largest amount of principal outstanding since January 1, 2018 and the date of this prospectus was \$1,725,000. On April 9, 2019, we made a payment of \$50,200 to pay off the remaining outstanding principal balance under the 2018 Notes. At the closing, we received approximately \$1.5 million from Hudson Bay. After closing and as of April 10, 2019, we have received approximately \$2.9 million from Hudson Bay upon exercise of Series Q Warrants.

On April 2, 2019, we sold an aggregate of \$1.1 million of units to Hudson Bay as part of the April 2019 Offering. Hudson Bay purchased 5,573,935 primary units and 5,810,309 alternative units. As a result of the April 2019 Offering, Hudson Bay received an aggregate of 5,337,561 shares of our Common Stock, a Series R warrant to purchase 5,573,935 shares of our Common Stock, and a Series S warrant to purchase 236,374 shares of our Common Stock.

Transactions with Intracoastal Capital

We believe that Intracoastal Capital, LLC (“Intracoastal”) became, and currently is, a “related person” as a result of being the beneficial owner of more than 5% of our outstanding Common Stock when we entered into the transaction listed below.

On April 2, 2019, we sold an aggregate of \$1.0 million of units to Intracoastal as part of the April 2019 Offering. Intracoastal purchased 5,263,157 primary units and 5,263,157 alternative units. As a result of the April 2019 Offering, Intracoastal received an aggregate of 5,263,157 shares of our Common Stock, and a Series R warrant to purchase 5,263,157 shares of our Common Stock.

Transaction with Iroquois

We believe that Iroquois Master Fund, Ltd became a “related person” as a result of the transaction described below as a result of becoming the beneficial owner of more than 5% of our outstanding Common Stock. Insofar as we have been able to ascertain, as of April 12, 2019, Iroquois is not a “related person.”

On January 2, 2018, we entered into a Cooperation Agreement with Iroquois Capital Management LLC, Iroquois Master Fund, Ltd., Iroquois Capital Investment Group LLC, Richard Abbe and Kimberly Page (collectively, “Iroquois Capital”), wherein Iroquois Capital agreed to (i) immediately terminate, and cease any and all solicitation and other efforts with respect to, the solicitation of proxies in opposition to our proposals for the 2017 annual meeting of shareholders, (ii) withdraw (and not resubmit) Iroquois’ proxy statement in opposition to our proposals for the 2017 annual meeting of shareholders, and (iii) promptly notify the staff of the SEC in writing that it is terminating the solicitation of proxies in opposition to the our proposals for the 2017 annual meeting of shareholders.

Pursuant to the Cooperation Agreement, we issued to Iroquois Master Fund LTD and Iroquois Capital Investment Group LLC, 456,000 and 144,000 unregistered and restricted shares of Common Stock respectively as reimbursement for expenses incurred in connection with the 2017 annual meeting of shareholders and the negotiation, execution and effectuation of the Cooperation Agreement.

Transaction with Mobomo, LLC

On May 23, 2017, the Company entered into an agreement with Mobomo, LLC for the design and development of certain intellectual property for a total fee of \$516,000. The intellectual property consisted of an integrated mobile phone application and the new RGS 365™ customer portal. As of December 31, 2018, and April 10, 2019, the Company had paid an aggregate amount of \$0.5 million.

Mobomo’s Chief Executive Officer Brian Lacey is the son of the Company’s CEO Dennis Lacey. The Company approved the agreement in accordance with its related-party transaction policy.

Our Policies Regarding Review, Approval or Ratification of Related-Party Transactions

Any related-party transaction is reviewed by disinterested members of management and, if material, by disinterested members of our Board of Directors or a committee thereof to ensure that the transaction reflects terms that are at least as favorable for us as we would expect in a similar transaction negotiated at arm’s length by unrelated parties.

EXPERTS

The financial statements as of and for the year ended December 31, 2018 included in this Prospectus and in the Registration Statement have been so included in reliance on the report of BDO USA, LLP, an independent registered public accounting firm (the report on the financial statements contains an explanatory paragraph regarding the Company’s ability to continue as a going concern) appearing elsewhere herein and in the Registration Statement, given on the authority of said firm as experts in auditing and accounting.

The consolidated financial statements of Real Goods Solar, Inc. as of December 31, 2017, and for the year then ended, included in this prospectus have been so included in reliance on the report (which report expresses an unqualified opinion and includes an explanatory paragraph regarding going concern uncertainty) of Moss Adams LLP, an independent registered public accounting firm, given upon the authority of such firm as experts in accounting and auditing.

LEGAL MATTERS

The validity of the Class A common stock issued and issuable upon exercise of the Warrants will be passed upon for us by Brownstein Hyatt Farber Schreck, LLP, Denver, Colorado.

INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE

The SEC allows us to “incorporate by reference” into this prospectus the information we file with the SEC, which means that we can disclose important information to you by referring you to other documents filed separately with the SEC. The information incorporated by reference is considered part of this prospectus, and any information that we file with the SEC subsequent to this prospectus and prior to the termination of the offerings referred to in this prospectus will automatically be deemed to update and supersede this information.

We incorporate by reference all documents we subsequently file with the SEC (other than information furnished pursuant to Item 2.02 or Item 7.01 of Form 8-K or as otherwise permitted by SEC rules) pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act after the initial filing of the registration statement of which this prospectus is a part (including prior to the effectiveness of the registration statement) and prior to the termination of the offering. Any documents that we subsequently file with the SEC will automatically update and supersede the information previously filed with the SEC and will be considered to be a part of this prospectus from the date those documents are filed. Thus, for example, in the case of a conflict or inconsistency between information set forth in this prospectus and information incorporated by reference into this prospectus, you should rely on the information contained in the document that was filed later.

This prospectus is part of a registration statement on Form S-1 that we have filed with the SEC relating to the Common Stock offered by this prospectus. As permitted by SEC rules, this prospectus does not contain all of the information included in the registration statement and the accompanying exhibits and schedules we file with the SEC. We have filed certain legal documents that control the terms of the Common Stock offered by this prospectus as exhibits to the registration statement. We may file certain other legal documents that control the terms of the Common Stock offered by this prospectus as exhibits to reports we file with the SEC. You may refer to the registration statement and the exhibits and schedules for more information about us and our securities. The registration statement and exhibits and schedules are also available at the SEC’s Public Reference Room or through its website.

We will provide, without charge and upon oral or written request, to each person, including any beneficial owner, to whom a copy of this prospectus has been delivered, a copy of any of the documents referred to above as being incorporated by reference into this prospectus but not delivered with it. You may obtain a copy of these filings, at no cost, by writing or calling us at Real Goods Solar, Inc., 110 16th Street, 3rd Floor, Denver, Colorado 80202, (303) 222-8300. Exhibits to the filings will not be provided, however, unless those exhibits have been specifically incorporated by reference in this prospectus.

WHERE YOU CAN FIND MORE INFORMATION

This prospectus, which constitutes a part of a registration statement on Form S-1 that we have filed with the SEC, omits certain of the information set forth in the registration statement. Accordingly, you should refer to the registration statement and its exhibits for further information with respect to us and our Common Stock. Copies of the registration statement and its exhibits are on file at the offices of the SEC. This prospectus contains statements concerning documents filed as exhibits. For the complete text of any of these documents, we refer you to the copy of the document filed as an exhibit to the registration statement.

We file annual, quarterly and current reports, proxy and information statements and other information with the SEC. The SEC maintains a website that contains information we file electronically with the SEC, which you can access over the Internet at <http://www.sec.gov>. We maintain a website at <http://www.rgsenergy.com> with information about our company. You may access copies of the documents incorporated by reference into this prospectus. Information contained on our website or any other website is not incorporated into this prospectus and does not constitute a part of this prospectus. Our website address referenced above is intended to be an inactive textual reference only and not an active hyperlink to our website.

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Report of Independent Registered Public Accounting Firm

Shareholders and Board of Directors
Real Goods Solar, Inc.
Denver, Colorado

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheet of Real Goods Solar, Inc. (the “Company”) and subsidiaries as of December 31, 2018, the related consolidated statements of operations, shareholders’ equity, and cash flows for the year ended December 31, 2018, and the related notes (collectively referred to as the “consolidated financial statements”). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company and subsidiaries at December 31, 2018, and the results of their operations and their cash flows for the year ended December 31, 2018, in conformity with accounting principles generally accepted in the United States of America.

Going Concern Uncertainty

The accompanying consolidated financial statements have been prepared assuming that the Company will continue as a going concern. As discussed in Note 1 to the consolidated financial statements, the Company has suffered recurring losses and negative cash flows from operations and has an accumulated deficit, which raises substantial doubt about its ability to continue as a going concern. Management’s plans in regard to these matters are also described in Note 1. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company’s management. Our responsibility is to express an opinion on the Company’s consolidated financial statements based on our audit. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (“PCAOB”) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company’s internal control over financial reporting. Accordingly, we express no such opinion.

Our audit included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audit also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audit provides a reasonable basis for our opinion.

/s/ BDO USA, LLP

We have served as the Company's auditor since 2018.
Dallas, Texas
April 15, 2019

Report of Independent Registered Public Accounting Firm

To the Shareholders and the Board of Directors of
Real Goods Solar, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheet of Real Goods Solar, Inc. (the "Company") as of December 31, 2017, the related consolidated statements of operations, shareholders' equity, and cash flows for the year then ended, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Company as of December 31, 2017, and the consolidated results of its operations and its cash flows for the year then ended, in conformity with accounting principles generally accepted in the United States of America.

Going Concern Uncertainty

The accompanying consolidated financial statements have been prepared assuming that the Company will continue as a going concern. As discussed in Note 1 to the consolidated financial statements, the Company has suffered recurring losses from operations and has an accumulated deficit as of December 31, 2017 that raise substantial doubt about its ability to continue as a going concern. Management's plans in regard to these matters are also described in Note 1. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated financial statements based on our audit. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audit we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audit included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures to respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audit also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audit provides a reasonable basis for our opinion.

/s/ Moss Adams LLP

Denver, Colorado

April 2, 2018, except for the reclassification adjustments applied to the 2017 financial statements as described under the heading *Discontinued Operations* in Note 2 as to which the date is April 15, 2019.

We have served as the Company's auditor from 2017 to 2018.

REAL GOODS SOLAR, INC.

Consolidated Balance Sheets

(in thousands, except share and per share data)	As of December 31,	
	2018	2017
ASSETS		
Current assets:		
Cash	\$ 5,831	\$ 1,170
Accounts receivable, net	1,340	2,787
Costs in excess of billings	11	62
Inventory, net	1,595	2,013
Deferred costs on uncompleted contracts	236	615
Other current assets	1,613	1,987
Total current assets	10,626	8,634
Property and equipment, net	778	1,154
POWERHOUSE™ license, net	3,202	1,114
Goodwill	-	1,338
Net investment in sales-type leases and other assets	1,654	2,018
Total assets	<u>\$ 16,260</u>	<u>\$ 14,258</u>
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities:		
Convertible debt, net	336	1
Accounts payable	862	1,657
Accrued liabilities	1,571	1,474
Deferred revenue and other current liabilities	956	1,810
Total current liabilities	3,725	4,942
Other liabilities	1,242	3,074
Common stock warrant liabilities	511	76
Total liabilities	<u>5,478</u>	<u>8,092</u>
Commitments and contingencies (Note 7)		
Shareholders' equity:		
Preferred stock, par value \$.0001 per share; 50,000,000 shares authorized; no shares issued and outstanding	-	-
Class A common stock, par value \$.0001 per share; 150,000,000 shares authorized; 91,859,638 and 8,151,845 shares issued and outstanding at December 31, 2018 and 2017, respectively	17	8
Class B common stock, par value \$.0001 per share; 50,000,000 shares authorized; no shares issued and outstanding	-	-
Additional paid-in capital	253,331	206,640
Accumulated deficit	(242,566)	(200,482)
Total shareholders' equity	<u>10,782</u>	<u>6,166</u>
Total liabilities and shareholders' equity	<u>\$ 16,260</u>	<u>\$ 14,258</u>

See accompanying notes to consolidated financial statements.

REAL GOODS SOLAR, INC.**Consolidated Statements of Operations**

(in thousands, except per share data)	For the years ended December 31,	
	2018	2017
Contract revenue:		
Sale and installation of solar energy systems	\$ 11,511	\$ 14,030
Service	1,159	1,509
Leasing, net	59	53
Contract expenses:		
Installation of solar energy systems	11,177	13,135
Service	1,589	1,623
Customer acquisition	3,616	5,918
Contract loss	(3,653)	(5,084)
Operating expense	9,793	10,789
Proxy contest expense	-	1,186
Goodwill impairment	1,338	-
Litigation	187	327
Operating loss	(14,971)	(17,386)
Change in fair value of derivative liabilities and loss on debt extinguishment	(27,134)	(379)
Amortization of debt discount and deferred loan costs	(1,042)	(3)
Other income	1,063	68
Net loss	\$ (42,084)	\$ (17,700)
Net loss per share:		
Basic and Diluted	<u>\$ (1.18)</u>	<u>\$ (2.55)</u>
Weighted-average shares outstanding:		
Basic and Diluted	<u>35,618</u>	<u>6,950</u>

See accompanying notes to consolidated financial statements.

REAL GOODS SOLAR, INC.

Consolidated Statement of Changes in Shareholders' Equity

(in thousands, except share data)	Class A Common Stock		Additional Paid - in Capital	Accumulated Deficit	Total Shareholders' Equity
	Shares	Amount			
Balances, January 1, 2017	1,183,151	\$ 8	\$ 187,752	\$ (182,782)	\$ 4,978
Equity changes related to compensation		-	249	-	249
Proceeds from common stock offering and warrant exercises, net of costs	6,780,939	-	17,095	-	17,095
Fair value of shares issued for convertible note and interest and preferred stock liability converted to common stock	177,018	-	734	-	734
Fractional shares issued in connection with reverse split	10,737	-	-	-	-
Proxy contest consideration	-	-	810	-	810
Net Loss	-	-	-	(17,700)	(17,700)
Balances, December 31, 2017	8,151,845	\$ 8	\$ 206,640	\$ (200,482)	\$ 6,166
Proceeds from January 2018 Offering of common stock issuance and warrant exercises, net of costs	1,600,000	-	1,524	-	1,524
Issuance and conversion of 2018 Notes, net of costs	72,826,126	8	31,816	-	31,824
Proceeds from warrant exercises related to 2018 Note Offering	8,681,667	1	13,088	-	13,089
Share-based compensation	-	-	263	-	263
Common stock issued to settle proxy contest	600,000	-	-	-	-
Net Loss	-	-	-	(42,084)	(42,084)
Balances, December 31, 2018	91,859,638	\$ 17	\$ 253,331	\$ (242,566)	\$ 10,782

See accompanying notes to consolidated financial statements.

REAL GOODS SOLAR, INC.

Consolidated Statements of Cash Flows

(in thousands)	For the years ended December 31,	
	2018	2017
Operating activities:		
Net loss	\$(42,084)	\$(17,700)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation	401	415
Amortization of POWERHOUSE™ License	33	-
Share-based compensation expense	263	249
Goodwill impairment	1,338	-
Change in fair value of derivative liabilities and loss on debt extinguishment	27,134	379
Amortization of debt discount and issuance costs	1,042	-
Bad debt expense	37	353
Inventory obsolescence	32	398
Gain on settlement of liability	(942)	-
(Gain) loss on sale of assets	-	(3)
Loss on settlement of proxy contest	-	810
Changes in operating assets and liabilities:		
Accounts receivable	1,410	397
Costs in excess of billings on uncompleted contracts	51	164
Inventory	386	(872)
Deferred costs on uncompleted contracts	379	(217)
Net investment in sales-type leases and other current assets	277	(945)
Other non-current assets	364	542
Accounts payable	(834)	(804)
Accrued liabilities	97	(844)
Billings in excess of costs on uncompleted contracts	-	(107)
Deferred revenue and other current liabilities	(854)	664
Other liabilities	(897)	1,086
Net cash used in operating activities	<u>(12,367)</u>	<u>(16,035)</u>
Investing activities:		
Payments related to POWERHOUSE™ license	(2,121)	(1,114)
Purchases of property and equipment	(25)	(432)
Payments related to RGS 365™ portal	-	(413)
Net cash used in investing activities	<u>(2,146)</u>	<u>(1,959)</u>
Financing activities:		
Proceeds from warrants	9,614	1,064
Proceeds from issuance of 2018 Notes	5,000	-
Proceeds from collection of Investor Notes	4,891	-
Proceeds from the issuance of common stock	920	16,187
Payments for transaction costs	(1,251)	(158)
Restricted cash released upon conversion of debt	-	173
Principal borrowings on revolving line of credit	-	1,498
Principal payments on revolving line of credit	-	(2,540)
Net cash provided by financing activities	<u>19,174</u>	<u>16,224</u>
Net increase (decrease) in cash	4,661	(1,770)
Cash at beginning of year	1,170	2,940
Cash at end of year	<u>\$ 5,831</u>	<u>\$ 1,170</u>
Supplemental cash flow information:		
Income taxes paid	-	-
Interest paid	-	8
Non-cash items		
Proxy contest settlement payment in shares of common stock	-	810
Debt discount arising from 2018 Note Offering	10,088	-
Embedded derivative liability with 2018 Note Offering	12,987	-
Common stock warrant liability with 2018 Note Offering	6,818	-
Issuance of Class A common stock for conversion of 2018 Notes, net of costs	31,824	-
Issuance of Class A common stock for exercise of common stock warrants	13,089	-
Interest paid with common stock	-	125

See accompanying notes to consolidated financial statements.

Notes to consolidated financial statements

1. Principles of Consolidation, Organization and Nature of Operations

Real Goods Solar, Inc. (“RGS” or the “Company”) is in the solar energy systems business as (i) the manufacturer of POWERHOUSE™ 3.0 in-roof solar shingles under a license agreement with Dow Global Technologies LLC (“Dow”) and (ii) a residential and commercial solar energy engineering, procurement, and construction firm (“EPC”).

The consolidated financial statements include the accounts of RGS and its wholly-owned subsidiaries. RGS has prepared the accompanying consolidated financial statements in accordance with accounting principles generally accepted in the United States, or GAAP, which include the Company’s accounts and those of its subsidiaries. Intercompany transactions and balances have been eliminated. The Company has included the results of operations of acquired companies from the effective date of acquisition.

POWERHOUSE™ License Agreement

A material significant event occurred on September 29, 2017 (the “Effective Date”), when the Company executed an exclusive domestic and international world-wide Technology License Agreement (the “License”) with Dow for its POWERHOUSE™ in-roof solar shingle. The License allows RGS to market the POWERHOUSE™ 3.0 product using the Dow name, and under the terms of the License agreed to a license fee of \$3 million. The license fee was comprised of two payments; the first \$1 million was paid in connection with the Effective Date of the License in 2017 and the remaining \$2 million was paid in 2018 in connection with receiving UL certification. The License requires the Company to commercialize and sell a minimum of 50 megawatts of solar within 5-years of the Effective Date to retain exclusive world-wide rights.

The Company obtained UL certification for POWERHOUSE™ 3.0 during November 2018, immediately after which the Company commenced commercialization of POWERHOUSE™ 3.0 entailing the manufacturing, marketing and sale of POWERHOUSE™ 3.0 to roofing companies and homebuilders. The first purchase order for POWERHOUSE™ 3.0 was received from a customer on December 27, 2018 and shipped to the customer in January 2019.

Liquidity and Financial Resources Update

The Company’s historical operating results indicate substantial doubt exists related to its ability to continue as a going concern. Management’s plans and actions, which are intended to mitigate the substantial doubt raised by the Company’s historical operating results in order to satisfy its estimated liquidity needs for a period of 12 months from the issuance of the consolidated financial statements, are discussed below. As the Company cannot predict, with certainty, the outcome of its actions to generate liquidity, or whether such actions would generate the expected liquidity as currently planned, management’s plans to mitigate the risk and extend cash resources through the evaluation period, are not considered probable under current accounting standards for assessing an entity’s ability to continue as a going concern.

As of December 31, 2018, the Company has cash of \$5.8 million, working capital of \$6.9 million, debt of \$0.5 million and shareholders’ equity of \$10.8 million.

The Company has experienced recurring operating losses and negative cash flow from operations which have necessitated:

- Exiting the mainland residential division and execution of a reduction in workforce, see Note 16. Subsequent Events;
- Focusing on growing POWERHOUSE™ revenue through a re-allocation of personnel to POWERHOUSE™ sales and initiating sales to other solar installers and distribution companies; and
- Raising additional capital. See Note 8. Shareholders Equity and Note 16. Subsequent Events for transactions to raise capital during the second quarter of 2019.

No assurances can be given that the Company will be successful with its plans to grow revenue for profitable operations.

The Company has historically incurred a cash outflow from its operations as its revenue has not been at a level for profitable operations. As discussed above, a key component of the Company’s revenue growth strategy is the sale of the POWERHOUSE™ 3.0 in-roof solar shingle. The Company obtained UL certification for POWERHOUSE™ at the close of 2018 and therefore only recently begun to market POWERHOUSE™ at the start of 2019. The Company believes that it will require several quarters to generate sales to meet its goals for profitable operations.

The first quarter of the year has always been one of the Company's slowest sales periods and as such, this is a period of higher cash outflow. POWERHOUSE™ 3.0 sales during the first quarter of 2019 have been materially less than the Company's expectations and, accordingly, the Company raised additional capital during the second quarter of 2019.

As discussed above, (i) the Company expects that future sales of POWERHOUSE™ 3.0 in-roof solar shingles will be its primary source of revenue and (ii) the Company only recently began marketing POWERHOUSE™ 3.0, and accordingly, expects to incur a quarterly cash outflow for a portion of 2019.

Errors Identified in Previously Issued Consolidated Financial Statements

During the preparation of the 2018 consolidated financial statements, the Company identified an error in the accounting for the 2018 Note Offering (Note 9. Convertible Debt). The Company incorrectly included debt issue costs of \$0.6 million in the calculation of the debt discount and loss upon issuance, which resulted in amortization of debt discount being overstated and the loss on debt extinguishment to be understated. As a result, "change in fair value of derivative liabilities and loss on debt extinguishment" was understated by \$0.5 million and \$0.7 million and "amortization of debt discount and deferred loan costs" was overstated by \$0.8 million and \$0.7 million for the quarters ended June 30, 2018, and September 30, 2018, respectively. The Company evaluated the impact of the error on its previously issued financial statements and concluded that the impact was not material. The error was corrected in the fourth quarter of 2018 and resulted in a net impact of \$0.09 million.

2. Significant Accounting Policies

Use of Estimates

The preparation of the consolidated financial statements in accordance with GAAP requires the Company to make estimates and assumptions that affect the amounts reported in the consolidated financial statements and accompanying notes. The Company bases its estimates on historical experience and on various other assumptions believed to be reasonable, the results of which form the basis for making judgments about the carrying values of assets and liabilities. Significant estimates are used to value warranty liabilities, the fair value of derivative liabilities embedded in complex financial instruments, common stock warrants, and allowance for doubtful accounts. Actual results could differ materially from those estimates.

Discontinued Operations

During 2014, the Company committed to a plan to sell certain contracts and rights comprised of the Company's large commercial installations business, otherwise known as the Company's former Commercial segment. The Company had previously reported this business as a discontinued operation, separate from the Company's continuing operations. As of December 31, 2018, this business no longer met the criteria to be presented as discontinued operations. The remaining assets and liabilities were reclassified out of discontinued operations to continuing operations on the consolidated balance sheet as of December 31, 2017. Income from discontinued operations on the consolidated statements of operations was reclassified into the loss related to current continuing operations for the years ended December 31, 2018 and 2017 and had no impact on net loss. References to any gains or losses from discontinued operations as well as net cash used or provided by discontinued operations were removed, with these amounts reclassified into the continuing operations figures for the years ending December 31, 2018 and 2017. The 2017 financial statements have been reclassified to eliminate the presentation of the business as a discontinued operation and did not result in a material change.

Cash

The Company considers all highly liquid instruments with an original maturity of three months or less to be cash equivalents. Cash equivalents consist primarily of demand deposit accounts with financial institutions that are denominated in U.S. dollars

Allowance for Doubtful Accounts

The Company maintains allowances for doubtful accounts for estimated losses resulting from the inability of its customers to make required payments. The Company estimates anticipated losses based on the expected collectability of all accounts receivable, taking into account collection history, number of days past due, identification of specific customer exposure and current economic trends. When the Company determines a balance is uncollectible and no longer actively pursues collection of the account, it is written off. The allowance for doubtful accounts was \$0.5 million and \$0.8 million December 31, 2018 and 2017, respectively.

Inventory

Inventory for our Solar Division consists primarily of solar energy system components (such as solar panels and inverters) and its cost is determined by the first-in, first-out ("FIFO") method. The inventory is stated at the lower of cost or net realizable value with an allowance for slow moving and obsolete inventory items based on an estimate of the markdown to the retail price required to sell or dispose of such items. The Company has an allowance for obsolete or slow-moving inventory of \$0.7 and \$0.6 million at December 31, 2018 and 2017, respectively.

POWERHOUSE™ inventories are recorded at lower of cost (incurred from third party supply channel manufacturers) or net realizable value. Cost is determined using the FIFO method. Management will establish an estimated excess and obsolete inventory reserve based on slow-moving and obsolete inventory. At December 31, 2018, there was no excess and obsolete inventory reserve.

Property and Equipment

Property and equipment is stated at cost less accumulated depreciation and amortization. Depreciation of property and equipment is computed on the straight-line method over estimated useful lives, generally three to twenty years. RGS amortizes leasehold and building improvements over the shorter of the estimated useful lives of the assets or the remaining term of the lease or remaining life of the building, respectively.

Goodwill and Purchased Intangibles

Intangible assets arising from business combinations, such as acquired customer contracts and relationships (collectively, “customer relationships”), licenses, trademarks, non-compete agreements are initially recorded at fair value. Goodwill represents the excess of the purchase price over the fair value of the net identifiable assets acquired in a business combination.

The Company early adopted ASU 2017-04 during the second quarter of 2018 while performing its annual impairment test. The Company’s impairment assessment begins with a qualitative assessment to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying value. The qualitative assessment includes comparing the overall financial performance of the reporting units against the planned results used in the last quantitative goodwill impairment test. If it is determined under the qualitative assessment that it is more likely than not that the fair value of a reporting unit is less than its carrying value, then a quantitative impairment test is performed. The estimated fair value of the reporting unit is compared with its carrying value (including goodwill) and if the carrying value exceeds estimated fair value, an impairment charge is recorded. As a result of the annual impairment test, the Company fully impaired the Goodwill balance charging an impairment loss to the Consolidated Statement of Operations.

Fair value of the reporting unit is determined using a discounted cash flow analysis. The use of present value techniques requires us to make estimates and judgments about the Company’s future cash flows. These cash flow forecasts will be based on assumptions that are consistent with the plans and estimates the Company uses to manage its business. The process of evaluating the potential impairment of goodwill is highly subjective and requires significant judgment at many points during the analysis. Application of alternative assumptions and definitions could yield significantly different results.

The Company capitalized the up-front POWERHOUSE™ 3.0 license payment, costs to obtain UL certification and legal costs to acquire the License. The intangible asset is amortized to operations, commencing November 2018 after UL certification, on a straight-line basis over the expected life of the License through 2034. As of December 31, 2018, the intangible asset had a carrying cost of \$3.2 million, with \$0.03 million in related amortization. The estimated amortization expense for each of the five succeeding fiscal years is expected to be \$0.2 million per annum.

Intangible assets with finite useful lives are amortized over their respective estimated useful lives and reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of the asset may not be recoverable.

Revenue Recognition

For the Company’s significant accounting policy related to revenue please see Note 3. Revenue.

Share-Based Compensation

The Company recognizes compensation expense for share-based awards based on the estimated fair value of the award on the date of grant and the probable attainment of a specified performance condition or over a service period. The Company uses the Black-Scholes option valuation model to estimate the fair value for purposes of accounting and disclosures. In estimating this fair value, certain assumptions are used (see Note 11. Share-Based Compensation), including the expected life of the option, risk-free interest rate, dividend yield, volatility and forfeiture rate. The use of different estimates for any one of these assumptions could have a material impact on the amount of reported compensation expense.

Income Taxes

The Company recognizes income taxes under the asset and liability method. Deferred income taxes are recognized based on temporary differences between financial reporting and income tax basis of assets and liabilities, using current enacted income tax rates and regulations. These differences will result in taxable income or deductions in future years when the reported amount of the asset or liability is recovered or settled, respectively. Considerable judgment is required in determining when these events may occur and whether recovery of an asset is more likely than not. RGS has significant net operating loss carry-forwards and evaluates at the end of each reporting period whether it expects it is more likely than not that the deferred tax assets will be fully recoverable and provides a tax valuation allowance as necessary. A valuation allowance is established if it is more likely than not that a deferred tax asset will not be realized. In determining the appropriate valuation allowance, the Company considered projected realization of tax benefits based on expected levels of future taxable income, available tax planning strategies, and its overall deferred tax position. To identify any uncertain tax positions, the Company reviews (1) the decision to exclude from the tax return certain income or transactions; (2) the assertion that a particular equity restructuring (e.g., a spin-off transaction) is tax-free when that position might actually be uncertain, and; (3) the decision not to file a tax return in a particular jurisdiction for which such a return might be required in tax years that are still subject to assessment or challenge under relevant tax statutes. The Company recognizes the effect of income tax positions only if those positions are more likely than not of being sustained. Recognized income tax positions are measured at the largest amount that is greater than 50% likely of being realized. Changes in recognition or measurement are reflected in the period in which the change in judgment occurs. The Company records interest related to unrecognized tax benefits in interest expense and penalties in selling, general, and administrative expenses when applicable.

Warranties

The Company warrants its EPC solar energy systems sold to customers for up to 10 years against defects in installation workmanship. The manufacturers' warranties on the solar energy system components, which are typically passed through to the customers, typically have product warranty periods of 10 years and a limited performance warranty period of 25 years. The Company generally provides for the estimated cost of warranties at the time the related revenue is recognized. The Company also maintains specific warranty liabilities for large commercial customers. The Company assesses the accrued warranty reserve quarterly and adjusts the amounts as necessary based on actual experience and changes in future estimates.

The Company's manufacturing warranties for its POWERHOUSE™ solar shingle, are an 11-year product warranty, which is the standard product warranty of most traditional solar panels today, and a 24-year power production warranty. The Company receives warranties from its supply chain matching the terms of the POWERHOUSE™ solar shingle warranty. As of December 31, 2018, there were no POWERHOUSE™ sales which required an estimate of warranty liability.

Net Loss per Share

RGS computes net loss per share by dividing net income (loss) by the weighted average number of shares of common stock outstanding for the period. Diluted net loss per share reflects the potential dilution that could occur if options or warrants to issue shares of the Company's Class A common stock were exercised. Common share equivalents of 10,445,294 and 5,857,861 shares have been omitted from net loss per share for 2018 and 2017, respectively, as they are anti-dilutive. The Series O warrants, Series Q warrants, and the 2018 Notes are considered participating securities, and as such, are entitled to participate in any dividends or distribution of assets made by the Company. There was no effect on earnings per share for these participating securities as the Company operated with a net loss for both 2018 and 2017. See Note 8. Shareholders' Equity for a description of these transactions.

The following table sets forth the computation of basic and diluted net income (loss) per share:

(In thousands, except per share data)	For the Years Ended December 31,	
	2018	2017
Numerator for basic and diluted net loss per share	\$ (42,084)	\$ (17,700)
Denominator:		
Weighted average shares for basic net loss per share	35,618	6,950
Effect of dilutive securities:		
Weighted average of common stock, stock options and warrants	-	-
Denominators for diluted net loss per share	35,618	6,950
Net loss per share—basic and diluted	\$ (1.18)	\$ (2.55)

Segment Information

Operating segments are defined as components of a company about which separate financial information is available that is evaluated regularly by the chief operating decision maker, or decision-making group, in deciding how to allocate resources and in assessing performance. The Company's chief operating decision maker is the executive team. Based on the financial information presented to and reviewed by the chief operating decision maker in deciding how to allocate the resources and in assessing the performance of the Company, the Company has determined that it has three reporting segments: Solar Division, POWERHOUSE™ and corporate expenses ("other segment").

Common Stock Warrants

The Company accounts for common stock warrants as either liabilities or as equity instruments depending on the specific terms of the warrant agreement. Certain of the Company's warrants are accounted for as liabilities due to redemption provisions that are outside the control of the Company. The Company classifies these warrant liabilities with maturities of five years on the Consolidated Balance Sheet as long-term liabilities. They are revalued at each balance sheet date after their initial issuance with changes in the value recorded in earnings. The Company used a Monte Carlo pricing model to value these warrant liabilities. The Company also has issued common stock warrants which have been classified in equity. Upon exercise of the warrants, the Company determines the fair value of the warrants exercised using the share price and records the impact to common stock and additional paid-in capital.

Derivatives

The Company's Senior Convertible Notes issued on April 9, 2018 (the "2018 Notes") contained conversion features and various redemption clauses that were required to be bifurcated and were initially measured and recorded at fair value and were revalued at each balance sheet date with changes in the value recorded in earnings. Each of the 2018 Notes gave the holder the right to convert the 2018 Notes into shares of Class A common stock at a set strike price ("conversion feature"). In addition to the conversion feature, redemption of the 2018 Notes could have been triggered by failure to notify the holders timely of a change in control, subsequent placement and failure to timely deliver shares to convert the 2018 Notes. The Company used a Lattice pricing model to value these derivative liabilities. The Lattice pricing model, which is based, in part, upon unobservable inputs for which there is little or no market data, required the Company to develop its own assumptions. Upon completing our fair value estimate of the derivative liabilities, the Company determined that the fair value exceeded the cash proceeds received and recorded a loss upon issuance. This loss was recorded within the "Change in fair value of derivative liabilities and loss on debt extinguishment" in our Consolidated Statements of Operations and the derivative liabilities are classified as short-term in the Consolidated Balance Sheet as of December 31, 2018, due to their maturity in April 2019. Upon exercise of the conversion option, the derivative liabilities and related debt host were accounted for as an extinguishment whereby a gain or loss was recognized in an amount equal to the difference between the recorded value of the liabilities and the fair value of the consideration issued to extinguish them.

Residential Leases

To determine lease classification, the Company evaluates lease terms to determine whether there is a transfer of ownership or bargain purchase option at the end of the lease, whether the lease term is greater than 75% of the useful life, or whether the present value of minimum lease payments exceed 90% of the fair value at lease inception. The Company's leased systems are treated as sales-type leases under GAAP accounting policies due to the present value of their minimum lease payments exceeding 90% of the fair value at lease inception.

Financing receivables are generated by solar energy systems leased to residential customers under sales-type leases. Financing receivables represents gross minimum lease payments to be received from customers over a period commensurate with the remaining lease term of up to 20 years and the systems estimated residual value, net of allowance for estimated losses. Initial direct costs for sales-type leases are recognized as cost of sales when the solar energy systems are placed in service.

For systems classified as sales-type leases, the net present value of the minimum lease payments, net of executory costs, is recognized as revenue when the lease is placed in service. This net present value as well as the net present value of the residual value of the lease at termination are recorded as other assets in the Consolidated Balance Sheet. The difference between the initial net amounts and the gross amounts are amortized to revenue over the lease term using the interest method. The residual values of the Company's solar energy systems are determined at the inception of the lease applying an estimated system fair value at the end of the lease term.

RGS considers the credit risk profile for its lease customers to be homogeneous due to the criteria the Company uses to approve customers for its residential leasing program, which among other things, requires a minimum "fair" FICO credit quality. Accordingly, the Company does not regularly categorize its financing receivables by credit risk.

Recently Issued Accounting Standards

ASU 2018-20, ASU 2018-11, ASU 2018-01 and ASU 2016-02

In February 2016, the FASB established Topic 842, Leases, by issuing Accounting Standards Update (ASU) No. 2016-02, which requires lessees to recognize leases on-balance sheet and disclose key information about leasing arrangements. Topic 842 was subsequently amended by ASU No. 2018-01, Land Easement Practical Expedient for Transition to Topic 842; ASU No. 2018-10, Codification Improvements to Topic 842, Leases; and ASU No. 2018-11, Targeted Improvements. The new standard establishes a right-of-use model (ROU) that requires a lessee to recognize a ROU asset and lease liability on the balance sheet for all leases with a term longer than 12 months. Leases will be classified as finance or operating, with classification affecting the pattern and classification of expense recognition in the income statement. The new standard is effective for the Company on January 1, 2019. A modified retrospective transition approach is required, applying the new standard to all leases existing at the date of initial application. An entity may choose to use either (1) its effective date or (2) the beginning of the earliest comparative period presented in the financial statements as its date of initial application. The Company has adopted the new standard on January 1, 2019 and used the effective date as its date of initial application. Consequently, financial information will not be updated and the disclosures required under the new standard will not be provided for dates and periods before January 1, 2019. The new standard provides a number of optional practical expedients in transition. The Company has elected the 'package of practical expedients'. The Company expects that this standard will have a material effect on our financial statements for contracts in which the Company is the lessee. While the Company continues to assess all of the effects of adoption, the Company currently believe the most significant effects relate to (1) the recognition of new ROU assets and lease liabilities on our balance sheet for our real estate and vehicle operating leases and (2) providing significant new disclosures about our leasing activities. The Company has made an accounting policy election to exclude immaterial leases from lease accounting and will continue to expense them as incurred similar to our capitalization policy. The new standard also provides practical expedients for an entity's ongoing accounting. The Company has elected the short-term lease recognition exemption for all leases that qualify. This means, for those leases that qualify, the Company will not recognize ROU assets or lease liabilities, and this includes not recognizing ROU assets or lease liabilities for existing short-term leases of those assets in transition. The Company has also elected the practical expedient to not separate lease and non-lease components for all of our leases.

The accounting standards noted above also requires lessors to classify leases as sales-type, direct financing or operating leases. The Company currently holds leases of solar systems where it is the lessor. While the Company continues to evaluate certain aspects of the new standard, it does not expect the new standard to have a material effect on its financial statements for contracts where the Company is the lessor and it does not expect a significant change in our sales-type leasing activities between now and adoption. The Company believes substantially all of its leases will continue to be classified as sales-type leases under the new standard. While the new standard identifies maintenance as a non-lease component of equipment lease contracts, the Company will account for solar system leases and associated maintenance service components as a single, combined lease component. Consequently, the Company does not expect the new standard's changed guidance on contract components to significantly affect its financial reporting.

ASU 2017-11

On July 13, 2017, the FASB issued Accounting Standards Update No. 2017-11 ("ASU 2017-11"), *Earnings Per Share (Topic 260); Distinguishing Liabilities from Equity (Topic 480); Derivatives and Hedging (Topic 815): (Part I) Accounting for Certain Financial Instruments with Down Round Features, (Part II) Replacement of the Indefinite Deferral for Mandatorily Redeemable Financial Instruments of Certain Nonpublic Entities and Certain Mandatorily Redeemable Noncontrolling Interests with a Scope Exception*. The amendments in Part I of ASU 2017-11 change the classification analysis of certain equity-linked financial instruments (or embedded features) with down round features. When determining whether certain financial instruments should be classified as liabilities or equity instruments, a down round feature no longer precludes equity classification when assessing whether the instrument is indexed to an entity's own stock. The amendments also clarify existing disclosure requirements for equity-classified instruments. The amendments in Part II of ASU 2017-11 recharacterize the indefinite deferral of certain provisions of Topic 480 that now are presented as pending content in the Codification, to a scope exception. Those amendments do not have an accounting effect. For public business entities, the amendments in Part I of ASU 2017-11 are effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2018. The amendments in Part II of ASU 2017-11 do not require any transition guidance because those amendments do not have an accounting effect. The Company will assess the impact of ASU 2017-11 on any derivative instruments entered into in the future.

Recently Adopted Accounting Standards

ASU 2017-04

On January 26, 2017, the FASB issued Accounting Standards Update No. 2017-04 ("ASU 2017-04"), *Intangibles – Goodwill and Other (Topic 350): Simplifying the Accounting for Goodwill Impairment*, which was issued to simplify the accounting for goodwill impairment. The guidance removes Step 2 of the goodwill impairment test, which requires a hypothetical purchase price allocation. Impairment will now be the amount by which a reporting unit's carrying value exceeds its fair value, not to exceed the carrying amount of goodwill. All other goodwill impairment guidance remains largely unchanged. The standard is effective for financial statements issued for fiscal years beginning after December 15, 2019. The Company early adopted ASU 2017-04 during the second quarter of 2018 while performing its annual impairment test. As a result, the Company fully impaired the Goodwill balance charging an impairment loss to the consolidated statement of operations.

ASU 2014-09

On May 28, 2014, the FASB issued Accounting Standards Update No. 2014-09 ("ASU 2014-09"), which created Topic 606, *Revenue from Contracts with Customers*. This standard outlines a single comprehensive model for companies to use in accounting for revenue arising from contracts with customers and supersedes most current revenue recognition guidance, including industry-specific guidance. The core principle of the revenue model is that revenue is recognized when a customer obtains control of a good or service. A customer obtains control when it has the ability to direct the use of and obtain the benefits from the good or service. Transfer of control is not the same as transfer of risks and rewards, as it is considered in current guidance. The Company adopted 2014-09 as of January 1, 2018 and utilized the modified retrospective method. See Note 3. Revenue below for all required disclosures.

3. Revenue

Effective January 1, 2018, the Company has adopted “ASC 606 – *Revenue from Contracts with Customers*” related to revenue recognition. Under the standard, revenue is recognized to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services using a five-step model to achieve that principle. In addition, the standard requires disclosures to understand the nature, amount, timing, and uncertainty of revenue and cash flows arising from contracts with customers. The Company has elected to adopt the modified retrospective method for transitioning this accounting standard which requires that the cumulative effect of applying the revenue standard to existing contracts be recorded as an adjustment to retained earnings. Based on the Company’s review of contracts that were not substantially completed on December 31, 2017, there was no impact to the opening retained earnings balance.

Deferred Revenue

When the Company receives 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, it records deferred revenue, which represents a contract liability. The Company recognizes deferred revenue as net sales after it has satisfied its performance obligations to the customer and all revenue recognition criteria are met.

Revenue Recognition – Installation of photovoltaic modules (“PV”) solar systems

The Company uses standard contract templates to initiate sales with customers and determined that each project started during the year ended December 31, 2018 and each project that was not substantially complete at the adoption date, contains one performance obligation. Although the contract states multiple services which are capable of being distinct, they are considered a single integrated output to the customer which is customized for each customer. As such all the services promised within a contract are considered one performance obligation. The Company generally recognizes revenue for installation of PV solar systems over time following the transfer of control to the customer which typically occurs as the PV solar system is being installed. If control transfers over time, revenue is recognized based on the extent of progress towards the completion of the performance obligation. The method utilized by the Company to measure the progress towards completion requires judgment and is based on the products and services provided. The Company utilizes the input method to measure the progress of its contracts because it best depicts the transfer of assets to the customer which incurs as materials are consumed by the project. The input method measures the progress towards completion based on the ratio of costs incurred to date (“actual cost”) to the total estimated costs (“budget”) at completion of performance obligation. Revenue, including estimated fees, are recorded proportionally as costs are incurred. Costs to fulfill include materials, labor and/or subcontractors’ costs, and other direct costs. Indirect costs and costs to procure the panels, inverters, and other system miscellaneous costs needed to satisfy the performance obligation are excluded since the customer does not gain control of those items until delivered to the site. Including the costs of those items would overstate the extent of our performance.

Each project’s transaction price is included within the contract and although there is only one performance obligation, changes to the contract price could take place after fulfillment of performance obligation. The Company has considered financing components on projects started during the year ended December 31, 2018 and elected the use of a practical expedient where an entity need not adjust the promised amount of consideration for the effects of a significant financing component if the entity expects, at contract inception, that the period between when the entity transfers a promised service to the customer and when the customer pays for that good or service will be one year or less. Typically, the payments are received as the performance obligation is being satisfied with a final payment received after the solar system has been installed. All receivables from projects are expected to be received within one year from project completion and there were no adjustments to the contract value.

Under ASC 606, the Company is required to recognize as an asset the incremental costs of obtaining a contract with a customer if those costs are expected to be recovered. The Company incurs sales commissions that otherwise would not have been incurred if the contract had not been obtained. These costs are recoverable; however, the Company has elected the use of a practical expedient to expense these costs as incurred as the amortization period of the asset would be less than one year.

Revenue Recognition – Operations & Maintenance

The Company generally recognizes revenue for standard, recurring commercial operations and maintenance services over time as customers receive and consume the benefits of such services, which typically include corrective maintenance, data hosting or energy/deck monitoring services for a period. These services are treated as stand-ready performance obligations and are satisfied evenly over the length of the agreement, so the Company has elected a time-based method to measure progress and recorded revenue using a straight-line method.

Revenue Recognition – Service & Warranty

Warranties for workmanship and roof penetration are included within each contract. These warranties cannot be purchased separately from the related services, are intended to safeguard the customer against workmanship defects and does not provide any incremental service to the customer. It is necessary for the Company to perform the specified tasks to provide assurance that the final product complies with agreed-upon specifications and likely do not give rise to a separate performance obligation. The Company will continue to account for any related warranties in accordance with ASC 460-10 and record an accrual for potential warranty costs at the completion of a project. Any services provided to a customer outside of warranties such as system inspections are recognized upon completion of the service.

Adoption of the standard related to revenue recognition had no impact to cash from or used in operating, financing, or investing on our consolidated cash flows statements. In the following table, revenue is disaggregated by primary geographical market and includes a reconciliation of the disaggregated revenue with the reportable segments for the years ended December 31, 2018 and 2017.

Reportable Segments					
December 31, 2018					
(in thousands)					
Primary Geographical Regions	Solar Division	POWERHOUSE™	Total reportable segments	All other segments	Total
East	\$ 10,022	\$ -	\$ 10,022	\$ -	\$ 10,022
West	2,681	-	2,681	25	2,706
	<u>\$ 12,703</u>	<u>\$ -</u>	<u>\$ 12,703</u>	<u>\$ 25</u>	<u>\$ 12,728</u>

Reportable Segments					
December 31, 2017					
(in thousands)					
Primary Geographical Regions	Solar Division	POWERHOUSE™	Total reportable segments	All other segments	Total
East	\$ 12,324	\$ -	\$ 12,324	\$ -	\$ 12,324
West	3,262	-	3,262	6	3,268
	<u>\$ 15,586</u>	<u>\$ -</u>	<u>\$ 15,586</u>	<u>\$ 6</u>	<u>\$ 15,592</u>

4. Property and Equipment

Property and equipment, stated at lower of cost or estimated fair value, consists of the following as of December 31:

(in thousands)	2018	2017
Buildings and leasehold improvements	\$ 441	\$ 441
Furniture, fixtures and equipment	1,832	1,811
Software	2,135	2,135
Vehicles and machinery	1,142	1,167
Total property and equipment	5,550	5,554
Accumulated depreciation and amortization	(4,772)	(4,400)
Total property and equipment, net	<u>\$ 778</u>	<u>\$ 1,154</u>

Depreciation on other property, plant and equipment is calculated using the straight-line method to allocate their depreciable amounts over their estimated useful lives as follows:

	Useful lives
Buildings	40 years
Leasehold improvements	3-5 years
Furniture, fixtures and equipment	3-5 years
Software	3-15 years
Vehicles and machinery	2-7 years

For the years ended December 31, 2018 and 2017, depreciation expense was \$0.4 million per annum.

5. Accrued Liabilities

Accrued expenses consist of the following:

(in thousands)	2018	2017
Accrued Expenses	\$ 924	\$ 524
Accrued Compensation	476	690
Other	69	130
Accrued Project Costs	102	130
Total	<u>\$ 1,571</u>	<u>\$ 1,474</u>

6. Related Parties

On May 23, 2017, the Company entered into an agreement with Mobomo, LLC (“Mobomo”) pursuant to the design and development of intellectual property at a cost of \$0.5 million. The intellectual property consisted of an integrated mobile phone application and the new RGS 365™ customer portal. In 2018, Mobomo continued to provide data hosting services which totaled approximately \$20,000.

Mobomo’s Chief Executive Officer Brian Lacey is the son of the Company’s CEO Dennis Lacey. The Company approved the agreement in accordance with its related-party transaction policy.

7. Commitments and Contingencies

The Company leases office and warehouse space through operating leases. Some of the leases have renewal clauses, which range from one month to five years.

The Company leases vehicles through operating leases for certain field personnel. Leases range up to five years with varying termination dates through May 2022.

The following schedule represents the annual future minimum payments of all leases as of December 31, 2018:

(in thousands)	Future Minimum Lease Payments
2019	\$ 848
2020	505
2021	378
2022	112
2023 and thereafter	-
Total minimum lease payments	<u>\$ 1,843</u>

The Company incurred office and warehouse rent expense of \$0.6 million and \$0.7 million for the years ended December 31, 2018 and 2017, respectively. The Company incurred automobile lease expense of \$0.3 million and \$0.4 million for the years ended December 31, 2018 and 2017, respectively.

The Company is subject to risks and uncertainties in the normal course of business, including legal proceedings; governmental regulation, such as the interpretation of tax and labor laws; and the seasonal nature of its business due to weather-related factors. The Company has accrued for probable and estimable costs incurred with respect to identified risks and uncertainties based upon the facts and circumstances currently available.

8. Shareholders’ Equity

January 2017 Reverse Stock Split

On January 25, 2017, the Company executed a reverse stock split of all outstanding shares of the Company’s Class A common stock at a ratio of one-for-thirty, whereby thirty shares of Class A common stock were combined into one share of Class A common stock. The reverse split was previously authorized by a vote of the Company’s shareholders on January 23, 2017. The Company did not decrease its authorized shares of capital stock in connection with the reverse stock split. Share amounts are presented to reflect the reverse split for all periods.

February 2017 Offerings

On February 6, 2017, the Company closed a \$11.5 million offering and sale of (a) units, "February 6 Primary Units," each consisting of one share of the Company's Class A common stock, and a Series K warrant to purchase one share of Class A common stock, and (b) units, "February 6 Alternative Units," each consisting of a prepaid Series L warrant to purchase one share of Common Stock, and a Series K warrant pursuant to the Securities Purchase Agreement, dated as of February 1, 2017, by and among the Company and several institutional investors, and to public retail investors. As a result, the Company issued 2,096,920 February 6 Primary Units, 1,613,080 February 6 Alternative Units, 2,096,920 shares of Class A common stock, Series K warrants to purchase 3,710,000 shares of Class A common stock, and Series L warrants to purchase 1,613,080 shares of Class A common stock. The purchase price for a February 6 Primary Unit was \$3.10 and the purchase price for a February 6 Alternative Unit was \$3.09. The Company received net proceeds of approximately \$10.5 million at the closing, after deducting commissions to the placement agents and estimated offering expenses payable by the Company associated with the offering.

On February 9, 2017, the Company closed a \$6 million offering and sale of (a) units, "February 9 Primary Units," each consisting of one share of the Company's Class A common stock, and a Series M warrant to purchase 75% of one share of Class A common stock, and (b) units, "February 9 Alternative Units," each consisting of a prepaid Series N warrant to purchase one share of Class A common stock, and a Series M warrant, pursuant to the Securities Purchase Agreement, dated as of February 7, 2017, by and among the Company and several institutional and accredited investors. As a result, the Company issued 1,650,000 February 9 Primary Units, 750,000 February 9 Alternative Units, 1,650,000 shares of Common Stock as part of the February 9 Primary Units, Series M warrants to purchase 1,800,000 shares of Class A common stock, and Series N warrants to purchase 750,000 shares of Class A common stock. The purchase price for a February 9 Primary Unit was \$2.50 and the purchase price for a February 9 Alternative Unit was \$2.49. The Company received net proceeds of approximately \$5.5 million at the closing, after deducting commissions to the placement agents and estimated offering expenses payable by the Company associated with the offering.

January 2018 Offering

On January 4, 2018, the Company closed a \$1.8 million offering and sale of (a) 800,000 shares of Class A common stock, (b) a prepaid Series P Warrant to purchase 800,000 shares of Class A common stock, and (c) a Series O Warrant to purchase 1,600,000 shares of Class A common stock, pursuant to the Securities Purchase Agreement, dated as of January 2, 2018, by and between the Company and one unaffiliated institutional and accredited investor. The purchase price was \$1.15 per share of Class A common. The Company received net proceeds of approximately \$1.5 million at the closing, after deducting commissions to the placement agents and estimated offering expenses associated with the offering.

2018 Convertible Note Offering

On March 30, 2018, the Company entered into a Securities Purchases Agreement with two unaffiliated institutional and accredited investors for a private placement (the "2018 Notes Offering", see Note 9) of up to \$10.75 million in principal amount and \$10 million funding amount (reflecting \$750,000 of original issue discount) of the 2018 Notes, and Series Q Warrants to purchase 9,270,457 shares of Class A Common Stock. As of December 31, 2018, a total of 73 million shares of Class A common stock had been issued upon conversion of the 2018 Notes, and 8.7 million shares of Class A common stock had been issued upon exercise of the Series Q warrants in exchange for gross proceeds of \$8.7 million, before placement agent fees and other expenses.

Option Exercises, 2018 Convertible Note Conversions and Warrant Exercises

During the twelve months ended December 31, 2018, the Company issued stock options as discussed in Note 11. Share-Based Compensation. During the twelve months ended December 31, 2018, the Company issued 800,000 shares of its Class A common stock upon exercise of Series P warrants and 81,507,793 shares upon conversion of the 2018 Notes and exercise of Series Q warrants.

At December 31, 2018, RGS had the following shares of Class A common stock reserved for future issuance:

Stock options and grants outstanding under incentive plans	1,206,645
Common stock warrants outstanding	8,714,871
2018 Notes outstanding - derivative liability	1,726,423
Total shares reserved for future issuance	<u>11,647,939</u>

The table below summarizes the Company's warrant activity:

	Issuances
Warrants outstanding at December 31, 2016	682,693
Issuances	8,178,580
Exercised	<u>(3,007,412)</u>
Warrants outstanding at December 31, 2017	5,853,861
Issuances	12,385,143
Expired	(42,465)
Exercised	<u>(9,481,668)</u>
Warrants outstanding at December 31, 2018	<u>8,714,871</u>

9. Convertible Debt

2018 Convertible Note Offering

On March 30, 2018, the Company entered into a Securities Purchase Agreement with two unaffiliated institutional and accredited investors for a private placement (the "2018 Note Offering") of up to \$10.75 million in principal amount and \$10 million funding amount (reflecting \$750,000 of original issue discount) of Series A Senior Convertible Notes ("Series A Notes"), Series B Senior Secured Convertible Notes ("Series B Notes," and collectively with the Series A Notes, the "2018 Notes"), and Series Q warrants (the "Series Q Warrants") to purchase 9,126,984 shares of Class A Common Stock. On April 9, 2018, the Company closed the 2018 Note Offering. At the closing on April 9, 2018, the Company received \$5 million of the gross proceeds and two secured promissory notes, one note from each investor, in a combined aggregate amount of \$5 million (each, an "Investor Note"), secured by cash and/or securities held in investor accounts. These Investor Notes are presented net of the convertible debt carrying amount on the Consolidated Balance Sheets due to right of offset. All amounts outstanding under the 2018 Notes matured and were due and payable on or before the one-year anniversary of the issuance of the 2018 Notes ("Maturity Date").

The 2018 Notes did not incur interest other than upon the occurrence of an event of default, in which case the 2018 Notes bore interest at 18% per year ("Interest Rate"). The 2018 Notes were convertible at any time, at the option of the holders, into shares of Common Stock at a conversion price. The initial fixed conversion price ("ICP") was \$1.2405 per share, subject to reduction, as described below, and adjustment for stock splits, stock dividends, and similar events.

The ICP of the 2018 Notes were subject to reduction subsequent to shareholder approval. On June 21, 2018 the Company held its 2018 annual shareholder meeting at which time the shareholders approved the 2018 Note Offering and thereby initiating a reset period which enabled the note holders to earn additional amounts ("Additional Amounts"), effectively a make-whole for amounts previously converted. As a result of the shareholder approval, the conversion price of the 2018 Notes and the exercise price of the Series Q Warrants were reset. Subsequent to that date, the Company agreed to permanently reduce the conversion price of the 2018 Notes from \$0.3223 to \$0.3067 effective on August 27, 2018. The 2018 Notes were convertible at any time, at the option of the holder, into shares of the Company's Class A common stock at a conversion price equal to \$0.3067. The Series Q Warrants were exercisable into shares of the Company's Class A common stock at an exercise price of \$0.3223 per share.

If the Company were to have consummated a Subsequent Placement, subject to some exceptions, a Note holder would have had the right to require that the Company redeem, in whole or in part, a portion of the amounts owed by the Company to such holder under a Note in cash. A Note holder could also have required the Company to redeem all or a portion of its 2018 Note in connection with a transaction resulting from a Change of Control and upon the occurrence of an event of default.

The 2018 Notes contained customary events of default, including but not limited to: (i) failure to file or have declared effective by the SEC the applicable registration statement required by the Registration Rights Agreement within certain time periods or failure to keep the registration statement effective as required by the Registration Rights Agreement, (ii) failure to maintain the listing of the Common Stock, (iii) failure to make payments when due under the Notes, (iv) breaches of covenants, and (v) bankruptcy or insolvency. The occurrence of an event of default under the 2018 Notes would have triggered default interest and would have caused an Equity Condition Failure, which may mean that the Company would have been unable to force mandatory conversion of the Notes and that Note Holders may not be required to prepay the Investor Note under a mandatory prepayment event. Following an event of default, Note holders could have required the Company to redeem all or any portion of their Notes in cash at a conversion price equal to the greater of (i) 125% of the amount to be redeemed, and (ii) the product of (A) the amount to be redeemed divided by the conversion price, multiplied by (B) the product of (x) 125% multiplied by (y) the greatest closing sale price of the Common Stock on any trading day during the period commencing on the date immediately preceding such event of default and ending on the date the Company makes the entire redemption payment.

The principal amount of the Series B Notes was considered restricted principal until collection of the Investor Notes was received by the Company ("Restricted Principal"). Upon any offset, the restricted principal under a Series B Note would automatically and simultaneously be reduced, on a dollar-for-dollar basis, in an amount equal to the principal amount of an investor's Investor Note cancelled and offset. Under the terms of the Series B Notes, the Company granted a security interest to each investor in such investor's Investor Note to secure the Company's obligations under the applicable Series B Note. Each investor perfected its security interest by taking possession of such investor's Investor Note at the closing.

Each Series Q Warrant is immediately exercisable and will expire five years from the date of issuance. Initially, only 75% of the shares of Common Stock issuable upon exercise of a Series Q Warrant may be exercised, which amount increases upon an investor's prepayment under such investor's Investor Note. A holder may not exercise any of the Series Q Warrants, and the Company may not issue shares of Common Stock upon exercise of any of the Series Q Warrants if, after giving effect to the exercise, a holder together with (i) any investment vehicle, including, any funds, feeder funds or managed accounts, currently, or from time to time after the issuance date, directly or indirectly managed or advised by the holder's investment manager or any of its affiliates or principals, (ii) any direct or indirect affiliates of the holder or any of the foregoing, (iii) any person acting or who could be deemed to be acting as a group together with the holder or any of the foregoing and (iv) any other persons whose beneficial ownership of the Company's Common Stock would or could be aggregated with the holder's and certain other "Attribution Parties" would beneficially own in excess of 4.99 or 9.99%, as elected by each investor at closing, of the outstanding shares of Common Stock. At each holder's option, the cap may be increased or decrease to any other percentage not in excess of 9.99%, except that any increase will not be effective until the 61st day after notice to the Company.

As disclosed in Note 2. Significant Accounting Policies, the warrants issued in connection with the 2018 Note Offering as well as the embedded derivatives were accounted for as liabilities that had been initially measured and recorded at fair value and were revalued at each balance sheet date after their initial issuance with the changes in value recorded in earnings. These conversion options accounted for as embedded derivatives were incorporated into the 2018 Notes to incentivize the holders to provide the Company with short term funding for POWERHOUSE™. See Note 10. Fair Value Measurements for information about the techniques the Company uses to measure the fair value of our derivative instruments. The fair value of the embedded derivatives and Series Q warrants exceeded the proceeds received from the 2018 Notes Offering which was recognized as a loss within the line item “Change in fair value of derivative liabilities and loss on debt extinguishment” in the statement of operations.

10. Fair Value Measurements

The Company complies with the provisions of FASB ASC No. 820, *Fair Value Measurements and Disclosures* (“ASC 820”), in measuring fair value and in disclosing fair value measurements at the measurement date. ASC 820 defines fair value, establishes a framework for measuring fair value and expands disclosures about fair value measurements required under other accounting pronouncements. FASB ASC No. 820-10-35, *Fair Value Measurements and Disclosures- Subsequent Measurement* (“ASC 820-10-35”), clarifies that fair value is an exit price, representing the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. ASC 820-10-35-3 also requires that a fair value measurement reflect the assumptions market participants would use in pricing an asset or liability based on the best information available. Assumptions include the risks inherent in a particular valuation technique (such as a pricing model) and/or the risks inherent in the inputs to the model.

ASC 820-10-35 discusses valuation techniques, such as the market approach (comparable market prices), the income approach (present value of future income or cash flow), and the cost approach (cost to replace the service capacity of an asset or replacement cost). The statement utilizes a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value into three broad levels. The following is a brief description of those three levels:

Level 1 Inputs – Level 1 inputs are unadjusted quoted prices in active markets for assets or liabilities identical to those to be reported at fair value. An active market is a market in which transactions occur for the item to be fair valued with sufficient frequency and volume to provide pricing information on an ongoing basis.

Level 2 Inputs – Level 2 inputs are inputs other than quoted prices included within Level 1. Level 2 inputs are observable either directly or indirectly. These inputs include: (a) Quoted prices for similar assets or liabilities in active markets; (b) Quoted prices for identical or similar assets or liabilities in markets that are not active, such as when there are few transactions for the asset or liability, the prices are not current, price quotations vary substantially over time or in which little information is released publicly; (c) Inputs other than quoted prices that are observable for the asset or liability; and (d) Inputs that are derived principally from or corroborated by observable market data by correlation or other means.

Level 3 Inputs – Level 3 inputs are unobservable inputs for an asset or liability. These inputs should be used to determine fair value only when observable inputs are not available. Unobservable inputs should be developed based on the best information available in the circumstances, which might include internally generated data and assumptions being used to price the asset or liability.

When determining the fair value measurements for assets or liabilities required or permitted to be recorded at and/or marked to fair value, the Company considers the principal or most advantageous market in which it would transact and considers assumptions that market participants would use when pricing the asset or liability. When possible, the Company looks to active and observable markets to price identical assets. When identical assets are not traded in active markets, the Company looks to market observable data for similar assets.

The following tables present the fair values of derivative instruments included in our consolidated balance sheets as of December 31, 2018 and 2017 (in thousands):

Fair Value of Derivative Instruments

	Liability Derivatives			
	2018		2017	
	Balance Sheet Location	Fair Value	Balance Sheet Location	Fair Value
Balance at December 31, 2018				
Derivatives not designated as hedging instruments				
Derivative liability	Convertible debt, net	\$ 344	N/a	\$ -

The Effect of Derivative Instrument on the Statement of Operations for the Nine Months Ended December 31, 2018 and 2017

Derivatives not designated as hedging instruments	Location of Loss Recognized in Statement of Operations	Amount of Loss Recognized in Statement of Operations	
		2018	2017
2018 Notes Conversion Options			
	Change in fair value of derivative liabilities and loss on debt extinguishment	\$ (27,134)	\$ -
	Amortization of debt discount & deferred loan costs	(1,042)	-
		<u>\$ (28,176)</u>	<u>\$ -</u>

The Company accounts for Series Q warrants in accordance with ASC 480. The Series Q warrants are accounted for as liabilities due to provisions in the warrants allowing the warrant holders to request redemption, upon a change of control, and failure to timely deliver shares of Class A common stock upon exercise or default. The Company classifies these warrant liabilities on the Consolidated Balance Sheet as long-term liabilities, which are revalued at each balance sheet date subsequent to their initial issuance. The Company used a Monte Carlo pricing model to value these warrant liabilities. The Monte Carlo pricing model, which is based, in part, upon unobservable inputs for which there is little or no market data, requires the Company to develop its own assumptions. The following tables summarize the basis used to measure certain financial assets and liabilities at fair value on a recurring basis in the consolidated balance sheets:

Balance at December 31, 2018 (in thousands)	Total	Quoted Prices		
		in Active Markets for Identical Items (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Common stock warrant liability	\$ 511	-	-	\$ 511
Derivative liability	344	-	-	344
	<u>\$ 855</u>	<u>-</u>	<u>-</u>	<u>\$ 855</u>

The following table shows the reconciliation from the beginning to the ending balance for the Company's common stock warrant liability and embedded derivative liability measured at fair value on a recurring basis using significant unobservable inputs (i.e. Level 3) for the period ended December 31, 2018:

(in thousands)	Common Stock warrant liability	Embedded derivative liability	Total
Fair value of financial liabilities at December 31, 2017	\$ 76	\$ -	\$ 76
Common stock warrant liability	6,818	-	6,818
Expiration of common stock warrant liabilities	(48)	-	(48)
Change in the fair value of common stock warrant liabilities, net	(1,940)	-	(1,940)
Adjustment for exercise of common stock warrant liabilities	(4,395)	-	(4,395)
Derivative liability	-	3,195	3,195
Investor Notes	-	(109)	(109)
Change in the fair value of derivative liabilities and additional amounts earned	-	17,910	17,910
Conversions of 2018 Notes	-	(20,652)	(20,652)
Fair value of financial liabilities at December 31, 2018	<u>\$ 511</u>	<u>\$ 344</u>	<u>\$ 855</u>

2018 Notes Derivative Liability

The fair value of the 2018 Notes derivative liabilities was derived using a Lattice pricing model, which is based, in part, upon unobservable inputs for which there is little or no market data, requiring the Company to develop its own assumptions. The assumptions used on April 9, 2018, June 30, 2018, September 30, 2018 and December 31, 2018 to value the derivative liabilities are as follows:

	Conversion Price	Closing Market Price (average)	Risk-free Rate	Dividend Yield	Market Price Volatility	Remaining Term (years)	Debt Yield	Soft Call Threshold	First Redemption Period	Second Redemption Period
Derivative Liability April 09, 2018	\$ 1.26	\$ 0.85	2.08%	0.00%	110%	1.00	60%	\$ 2.52	20%	25%
Derivative Liability June 30, 2018	\$ 0.55	\$ 0.57	2.23%	0.00%	130%	0.78	60%	\$ 2.52	20%	25%
Derivative Liability September 30, 2018	\$ 0.31	\$ 0.39	2.36%	0.00%	125%	0.53	60%	\$ 2.52	20%	25%
Derivative Liability December 31, 2018	\$ 0.31	\$ 0.52	2.45%	0.00%	90%	0.28	60%	\$ 2.52	20%	25%

Common Stock Warrants

The fair value of Series Q Warrants was derived using a Monte Carlo pricing model, which is based, in part, upon unobservable inputs for which there is little or no market data, requiring the Company to develop its own assumptions. The assumptions used on April 9, 2018, June 30, 2018, September 30, 2018 and December 31, 2018 to value the common stock warrant liabilities are as follows:

	<u>Exercise Price</u>	<u>Strike Floor</u>	<u>Closing Market Price (average)</u>	<u>Risk-free Rate</u>	<u>Dividend Yield</u>	<u>Market Price Volatility</u>	<u>Remaining Term (years)</u>
Warrant Liability April 09, 2018	\$ 1.12	\$ 0.97	\$ 0.85	2.60%	0.00%	120%	5.00
Warrant Liability June 30, 2018	\$ 0.55	\$ 0.19	\$ 0.57	2.72%	0.00%	115%	4.78
Warrant Liability September 30, 2018	\$ 0.32	\$ 0.19	\$ 0.39	2.93%	0.00%	115%	4.53
Warrant Liability December 31, 2018	\$ 0.32	N/a	\$ 0.52	2.49%	0.00%	120%	4.28

2018 Options

The determination of the estimated fair value of the 2018 Options (as defined in Note 10) using the Black-Scholes option-pricing model was affected by the Company's stock price as well as assumptions regarding a number of complex and subjective variables. Expected volatilities were based on a value calculated using the historical stock price volatility. Expected life was based on the specific vesting terms of the option and anticipated changes to market value and expected employee exercise behavior. The risk-free interest rate used in the option valuation model was based on U.S. Treasury zero-coupon securities with remaining terms similar to the expected term on the options. RGS does not anticipate paying any cash dividends on its Class A common stock in the foreseeable future and, therefore, an expected dividend yield of zero was used in the option valuation model. The assumptions used to value to 2018 Options as of December 31, 2018 are as follows:

2018 Non-Qualified Stock Options

<u>Grant Date</u>	<u>Vesting Period</u>	<u>Expected Life</u>	<u>Expected Dividend Rate</u>	<u>Risk-free Rate</u>	<u>Market Price Volatility</u>
June 21, 2018	2.78 years	4.2 years	0%	2.70%	148.77%
September 4, 2018	2.82 years	5.7 years	0%	2.78%	147.40%
September 10, 2018	2.81 years	5.7 years	0%	2.83%	146.66%
October 15, 2018	2.96 years	4.3 years	0%	2.96%	149.82%
October 29, 2018	2.92 years	4.3 years	0%	2.87%	150.34%

Nonrecurring Fair Value Measurements

The Company tests its long-lived assets for impairment annually or whenever events or changes in circumstances indicate that the carrying value may not be recoverable or that the carrying value may exceed its fair value.

As described in Note 12. Goodwill Impairment, during the second quarter of 2018, the Company recorded a \$1.3 million impairment charge related to goodwill measured at fair value on a nonrecurring basis. When recognizing an impairment charge, the carrying value of the asset is reduced to fair value and the difference is recorded within operating earnings in our consolidated statements of operations. The fair value measurements included in the indefinite-lived intangible impairments were primarily based on significant unobservable inputs (Level 3) developed using company-specific information.

Other Financial Instruments

The Company's financial instruments consist primarily of cash and cash equivalents, accounts receivable, accounts payable, deferred revenue and convertible debt. The carrying values of these financial instruments approximate their fair values, due to their short-term nature.

11. Share-Based Compensation

At December 31, 2017, the Company's 2008 Long-Term Incentive Plan provided that an aggregate of 52,536 shares of its Class A common stock could be issued or subject to awards under the plan. Employees, members of the Board of Directors, consultants, service providers and advisors were eligible to participate in the 2008 Long-Term Incentive Plan. The 2008 Long-Term Incentive Plan expired under its terms in 2018. All outstanding options are nonqualified and were generally granted with an exercise price equal to the closing market price of the Company's Class A common stock on the date of the grant. Options vest based on service conditions, performance (attainment of a certain amount of pre-tax income for a given year), or some combination thereof. Grants typically expire seven years from the date of grant.

On June 21, 2018, Company shareholders approved the Real Goods Solar 2018 Long-Term Incentive Plan (the “2018 Incentive Plan”) which allows the Company to issue, or grant awards for, up to 1,300,000 shares of Class A common stock. Employees or individuals who perform services for the Company are eligible to participate in the 2018 Incentive Plan, which terminates upon the earlier of a board resolution terminating the 2018 Incentive Plan or ten years after the effective date of June 21, 2018, unless extended by action of the Board of Directors for up to an additional five years. All options are non-qualified and are generally granted with an exercise price equal to the closing market price of the Company’s Class A common stock on the date of the grant. Under the 2018 Incentive Plan, the Company granted multiple non-qualified stock options (“2018 Options”) with various requisite service periods, described in Note 9 Fair Value Measurements, which expire seven years from the grant date. On the last day of each calendar quarter occurring after the grant date, the 2018 Options will vest at 8.3% contingent on continuous employment. The 2018 Options are classified as equity and measured using the “fair-value-based method” with share-based compensation expense recognized in the income statement on a straight-line basis over the requisite service for the entire award.

The determination of the estimated fair value of share-based payment awards on the date of grant using the Black-Scholes option-pricing model is affected by the Company’s stock price as well as assumptions regarding a number of complex and subjective variables. Expected volatilities are based on a value calculated using the combination of historical volatility of comparable public companies in RGS’ industry and its stock price volatility since the Company’s initial public offering. Expected life is based on the specific vesting terms of the option and anticipated changes to market value and expected employee exercise behavior. The risk-free interest rate used in the option valuation model is based on U.S. Treasury zero-coupon securities with remaining terms similar to the expected term on the options. RGS does not anticipate paying any cash dividends on its Class A common stock in the foreseeable future and, therefore, an expected dividend yield of zero is used in the option valuation model. RGS is required to estimate forfeitures at the time of grant and revise those estimates in subsequent periods if actual forfeitures differ from those estimates. In accordance with ASC 718, an entity can make an accounting policy to either estimate the number of awards that are expected to vest or account for forfeitures as they occur. The Company utilizes the plan life-to-date forfeiture experience rate to estimate option forfeitures and records share-based compensation expense only for those awards that are expected to vest.

The tables below present a summary of the Company’s option activity as of December 31, 2018 and 2017 and changes during the years then ended:

	Shares	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (Yrs)	Aggregate Intrinsic Value
Outstanding at January 1, 2017	185	\$ 15,736.67	3.30	\$ -
Granted	-	-		
Exercised	-	-		
Forfeited or expired	(36)	4,990.00		
Outstanding at December 31, 2017	149	\$ 18,452.38	2.60	\$ -
Exercisable at December 31, 2017	141	\$ 19,418.30	2.80	\$ -
Granted	1,331,500	0.96		
Exercised	-	-		
Forfeited or expired	(125,004)	1.13		
Outstanding at December 31, 2018	1,206,645	\$ 3.22	6.58	\$ -
Exercisable at December 31, 2018	268,189	\$ 11.26	6.53	\$ -

The Company granted 1,331,500 stock options and cancelled 125,004 stock options and did not grant any stock options and cancelled 36 stock options during 2018 and 2017, respectively. The Company’s share-based compensation cost charged against income for continuing operations was approximately \$0.2 million and \$0.2 million during the years 2018 and 2017, respectively.

12. Goodwill Impairment

The Company performed its annual test of goodwill as of June 30, 2018, and based on the results of this test, the Company determined that the fair value of the goodwill no longer exceeded the carrying amount. The fair value was determined using a discounted cash flow valuation technique and resulted in the full impairment of goodwill of \$1.3 million charging an impairment loss to the consolidated statement of operations during the twelve months ended December 31, 2018.

13. Supplier Concentration

The Company relies on a limited number of third-party suppliers to provide the components used in our POWERHOUSE™ in-roof solar shingles and our solar energy systems. The production of POWERHOUSE™ solar laminates, connectors and wire harnesses is concentrated in China so it is reasonably possible that operations could be disrupted in the future.

14. Income Taxes

On December 22, 2017, The President of the United States signed the TCJA. The enactment of TCJA requires companies, under Accounting Standards Codification (ASC) 740, Income Taxes, to recognize the effects of changes in tax laws and rates on deferred tax assets and liabilities and the retroactive effects of changes in tax laws in the period in which the new legislation is enacted. The TCJA would permanently reduce the maximum corporate income tax rate from 35% to 21% effective for tax years beginning after December 31, 2017, and the future benefits of existing deferred tax assets would need to be computed at the new tax rate. In addition to the change in the corporate income tax rate, the TCJA further introduced a number of other changes including a one-time transition tax via a mandatory deemed repatriation of post-1986 undistributed foreign earnings and profits; the introduction of a tax on global intangible low-taxed income ("GILTI") for tax years beginning after December 31, 2017; the limitation of deductible net interest to 30% of adjustable taxable income; the further limitation of the deductibility of share-based compensation of certain highly compensated employees; the ability to elect to accelerate bonus depreciation on certain qualified assets; and the Base Erosion and Anti-Abuse Tax ("BEAT"), amongst other changes. The Company recognized the income tax effects of the 2017 Tax Act in its financial statements in accordance with Staff Accounting Bulletin (SAB) No. 118, which provides SEC staff guidance for the application of ASC Topic 740, Income Taxes. The Company has finalized its accounting for the income tax effects of the 2017 Tax Act.

The tax effects recorded primarily include an estimate of the impact of the reduction in the U.S. tax rate on our deferred tax assets and liabilities in 2017. The Company had \$0 of income tax expense (benefit) for the years ended December 31, 2018 and 2017. Variations from the federal statutory rate are as follows:

(in thousands)	Years ended December 31,	
	2018	2017
Expected federal income tax expense (benefit) at statutory rate of 21% and 35% at December 31, 2018 and 2017, respectively	\$ (8,888)	\$ (6,191)
Effect of permanent other differences		
Debt extinguishment	5,145	170
Transaction Cost Amortization	552	-
Other	319	(28)
Effect of valuation allowance	3,479	(12,572)
Other	39	(1,147)
Impact of change in federal tax rate on deferred tax asset	-	20,479
State income tax expense (benefit), net of federal benefit	(646)	(690)
	<u>\$ -</u>	<u>\$ 21</u>

Deferred income taxes reflect net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. The components of the net accumulated deferred income tax assets shown on a gross basis as of December 31, 2018 and 2017 are as follows:

(in thousands)	2018	2017
Deferred tax assets (liabilities)		
Provision for doubtful accounts	\$ 138	\$ 195
Inventory-related expense	195	209
Accrued liabilities	367	444
Depreciation and amortization	2,084	2,128
Net operating loss carry-forwards	39,154	35,754
Other	705	719
Total deferred tax assets	42,643	39,449
Valuation allowance	(42,643)	(39,449)
Total net deferred tax assets	<u>\$ -</u>	<u>\$ -</u>

At December 31, 2018, RGS had \$140.7 million of federal net operating loss carryforwards expiring, if not utilized, beginning in 2020 and \$14.1 million with no expiration. Additionally, the Company had \$142.8 million of state net operating loss carryforwards expiring, if not utilized, beginning in 2020.

Utilization of the net operating loss carry-forwards may be subject to annual limitation under applicable federal and state ownership change limitations and, accordingly, net operating losses may expire before utilization. The Company has not completed a Section 382 analysis through December 2018 and therefore has not determined the impact of any ownership changes, as defined under Section 382 of the Internal Revenue Code has occurred in prior years. Therefore, the net operating loss carryforwards above do not reflect any possible limitations and potential loss attributes to such ownership changes. However, the Company believes that upon completion of a Section 382 analysis, as a result of prior period ownership changes, substantially all of the net operating losses will be subject to limitation.

The Company's valuation allowance increased by approximately \$3.5 million for the year ended December 31, 2018 as a result of its operating loss for the year. The valuation allowance was determined in accordance with the provisions of ASC 740, Income Taxes, which requires an assessment of both negative and positive evidence when measuring the need for a valuation allowance. Based upon the available objective evidence and the Company's history of losses, management believes it is more likely than not that the net deferred tax assets will not be realized. At December 31, 2018, the Company has a valuation allowance against its deferred tax assets net of the expected income from the reversal of its deferred tax liabilities.

The Company's predecessor, Real Goods Trading Corporation, was acquired by Gaiam, Inc. (now known as Gaia, Inc. and hereinafter as Gaia) in 2001. Gaia operated Real Goods Trading Corporation essentially as a separate business until 2008 when operations were consolidated into the corporate entity, Real Goods Solar, Inc., upon its formation. Following the Company's initial public offering, a tax sharing agreement was entered into with Gaia. The Company is required, under the terms of its tax sharing agreement with Gaia, to distribute to Gaia the tax effect of certain tax loss carryforwards as utilized by the Company in preparing its federal, state and local income tax returns. At December 31, 2018, utilizing the new federal income tax rate of 21%, the Company estimates that the maximum amount of such distributions to Gaia could aggregate \$1.1 million.

15. Segment Information

Financial information for the Company's segments and a reconciliation of the total of the reportable segments' income (loss) from operations (measures of profit or loss) to the Company's consolidated net loss are as follows:

(in thousands)	2018	2017
Contract revenue:		
Solar Division	12,703	15,586
POWERHOUSE™	-	-
Other	25	6
Consolidated contract revenue	12,728	15,592
Operating loss from continuing operations:		
Solar Division	(5,855)	(8,729)
POWERHOUSE™	(598)	(20)
Other	(8,518)	(8,637)
Operating Loss	(14,971)	(17,386)
Reconciliation of consolidated loss from operations to consolidated net loss:		
Other income	1,063	68
Change in fair value of derivative liabilities and loss on debt extinguishment	(27,134)	(379)
Amortization of debt discount and deferred loan costs	(1,042)	(3)
Net loss	(42,084)	(17,700)

The following is a reconciliation of reportable segments' assets to the Company's consolidated total assets. The Other segment includes certain unallocated corporate amounts.

(in thousands)	2018	2017
Total assets:		
Solar Division	\$ 10,615	\$ 9,840
POWERHOUSE™	1,366	1,140
Other	4,279	3,278
	\$ 16,260	\$ 14,258

16. Subsequent Events

On March 29, 2019, the Company announced an operational realignment to exit its mainland residential solar business so as to focus on the POWERHOUSE™ in-roof shingle market. Revenues and net loss in 2018 for the mainland residential solar business were approximately \$8.9 million and \$6.3 million, respectively.

On April 4, 2019, the Company closed a registered offering in which it issued and sold (i) 15,938,280 shares of Class A common stock, (ii) prepaid Series S Warrants to purchase 1,430,141 shares of Class A common stock and (iii) Series R Warrants to purchase 17,368,421 shares of Class A common stock pursuant to the terms of the Securities Purchase Agreement dated April 2, 2019 between the Company and the investors. The investors paid \$0.19 per share of Class A common stock and \$0.18 per share of Class A common stock underlying the Series S Warrant for aggregate gross proceeds of \$3.3 million at the closing and before \$0.34 million of expenses.

PART II. INFORMATION NOT REQUIRED IN PROSPECTUS

Item 13. Other Expenses of Issuance and Distribution

The following expenses incurred in connection with the sale of the securities being registered will be borne by the registrant. Other than the SEC registration fee, the amounts stated are estimates.

SEC Registration Fee	\$	511.56
Legal Fees and Expenses	\$	40,000
Accounting Fees and Expenses	\$	20,000
Miscellaneous	\$	10,000
Total	\$	70,511.56

Item 14. Indemnification of Directors and Officers

The Colorado Business Corporation Act (the "CBCA") generally provides that a corporation may indemnify a person made party to a proceeding because the person is or was a director against liability incurred in the proceeding if: the person's conduct was in good faith; the person reasonably believed, in the case of conduct in an official capacity with the corporation, that such conduct was in the corporation's best interests, and, in all other cases, that such conduct was at least not opposed to the corporation's best interests; and, in the case of any criminal proceeding, the person had no reasonable cause to believe that the person's conduct was unlawful. The CBCA prohibits such indemnification in a proceeding by or in the right of the corporation in which the person was adjudged liable to the corporation or in connection with any other proceeding in which the person was adjudged liable for having derived an improper personal benefit. The CBCA further provides that, unless limited by its articles of incorporation, a corporation shall indemnify a person who was wholly successful, on the merits or otherwise, in the defense of any proceeding to which the person was a party because the person is or was a director or officer of the corporation, against reasonable expenses incurred by the person in connection with the proceeding. In addition, a director or officer, who is or was a party to a proceeding, may apply for indemnification to the court conducting the proceeding or to another court of competent jurisdiction. The CBCA allows a corporation to indemnify and advance expenses to an officer, employee, fiduciary or agent of the corporation to the same extent as a director.

As permitted by the CBCA, the Company's articles of incorporation and bylaws generally provide that the Company shall indemnify its directors and officers to the fullest extent permitted by the CBCA. In addition, the Company may also indemnify and advance expenses to an officer who is not a director to a greater extent, not inconsistent with public policy, and if provided for by its bylaws, general or specific action of the Company's board of director or shareholders.

The Company has entered into substantively identical Indemnification Agreements with two current director and several former directors and officers (the "Indemnitees"), which generally provide that, to the fullest extent permitted by Colorado law, the Company shall indemnify such Indemnitee if the Indemnitee was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative, by reason of the fact that the Indemnitee is or was or has agreed to serve at the Company's request as a director, officer, employee or agent of the Company, or while serving as a director or officer of the Company, is or was serving or has agreed to serve at the Company's request as a director, officer, employee or agent of another corporation, partnership, joint venture, trust, employee benefit plan or other enterprise, or by reason of any action alleged to have been taken or omitted in such capacity or by reason of the imposition upon such officer or director of any federal and/or state income tax obligation (inclusive of any interest and penalties, if applicable), that is imposed on such officer or director with respect to income, "phantom income," rescinded or unconsummated transactions, or any other allegedly taxable event for which no benefit was received by such officer or director. The indemnification obligation includes, without limitation, claims for monetary damages against an Indemnitee in respect of an alleged breach of fiduciary duties and generally covers expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by an Indemnitee or on an Indemnitee's behalf in connection with such action, suit or proceeding and any appeal therefrom, but shall only be provided if the Indemnitee acted in good faith; and, in the case of conduct in an official capacity with the corporation, if such conduct was in the Company's best interests, and, in all other cases, if such conduct was at least not opposed to the Company's best interests; and, with respect to any criminal action, suit or proceeding, if the Indemnitee had no reasonable cause to believe the Indemnitee's conduct was unlawful.

Section 7-108-402(1) of the CBCA permits a corporation to include in its articles of incorporation a provision eliminating or limiting the personal liability of directors to the corporation or its shareholders for monetary damages for any breach of fiduciary duty as a director (except for breach of a director's duty of loyalty, acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, unlawful distributions, or any transaction from which the director derived improper personal benefit). Further, Section 7-108-402(2) of the CBCA provides that no director or officer shall be personally liable for any injury to persons or property arising from a tort committed by an employee, unless the director or officer was either personally involved in the situation giving rise to the litigation or committed a criminal offense in connection with such situation.

As permitted by the CBCA, the Company's articles of incorporation provide that the personal liability of the Company's directors to the Company or its shareholders is limited to the fullest extent permitted by the CBCA. The Indemnification Agreements described above also provide that the Company's indemnification obligation includes, without limitation, claims for monetary damages against the Indemnitee in respect of an alleged breach of fiduciary duties to the fullest extent permitted by the CBCA.

Section 7-109-108 of the CBCA provides that a corporation may purchase and maintain insurance on behalf of a person who is or was a director, officer, employee, fiduciary or agent of the corporation, or who, while a director, officer, employee, fiduciary or agent of the corporation, is or was serving at the request of the corporation as a director, officer, partner, trustee, employee, fiduciary or agent of another entity or an employee benefit plan, against liability asserted against or incurred by the person in that capacity or arising from the person's status as a director, officer, employee, fiduciary or agent, whether or not the corporation would have power to indemnify the person against the same liability under the CBCA.

As permitted by the CBCA, the Company's bylaws authorize the Company to purchase and maintain such insurance. The Company currently maintains a directors and officers insurance policy insuring its past, present and future directors and officers, within the limits and subject to the limitations of the policy, against expenses in connection with the defense of actions, suits or proceedings, and certain liabilities that might be imposed as a result of such actions, suits or proceedings.

Item 15. Recent Sales of Unregistered Securities

All share amounts and the per share consideration received in the following description of recent sales of unregistered securities have been restated to give effect to reverse stock splits affected by the Company on June 2, 2016 and January 25, 2017.

1. April 2016 Convertible Notes, Series G Warrants and April 2016 PA Warrants

On April 1, 2016, the Company issued \$10.0 million of 2016 Notes and Series G Warrants to purchase 8,300 shares of Common Stock to institutional and accredited investors in connection with the April 2016 Offering.

The 2016 Notes were convertible into shares of Common Stock at a floating conversion price. From September 29, 2016 thorough January 30, 2017 (there were no subsequent conversions), holders converted an aggregate principal amount of \$10,000,000 into 596,070 shares of Common Stock at a weighted average exercise price of \$16.90 per share and holders converted an aggregate amount of interest of \$552,860 into 64,108 shares of Common Stock at a weighted average exercise price of \$7.19 per share.

On April 1, 2016, in connection with the April 2016 Offering, the Company sold and issued to the placement agent, Roth, for an aggregate purchase price of \$100, the April 2016 PA Warrant to purchase 1,411 shares of Common Stock pursuant to the terms of the engagement letter between the Company and Roth.

2. *May 2016 Common Stock*

On May 25, 2016 the Company and its wholly-owned subsidiaries RGS Financing, Inc., Real Goods Energy Tech, Inc., Alteris Renewables, Inc., Real Goods Syndicated, Inc., Mercury Energy, Inc., Real Goods Solar, Inc. – Mercury Solar, Elemental Energy, LLC, and Sunetric Management LLC (collectively with the Company, the “Borrower Parties”) entered into a First Loan Modification Agreement effective as of May 19, 2016 (the “Modification Agreement”), with Solar Solutions and Distribution, LLC, a Colorado-based renewable energy solutions company (“Solar Solutions”). The Modification Agreement modified the Amended and Restated Loan Agreement dated March 30, 2016 between the Borrower Parties and Solar Solutions (the “Loan Agreement”) to: (i) reschedule the payment of \$167,513.41 from May 15, 2016 to a date on or before June 3, 2016; and (ii) require the Company to issue to Solar Solutions 969 shares of its Common Stock at a price of \$172.80 per share as a payment on the revolving line of credit under the Loan Agreement.

3. *December 2016 PA Warrants*

On December 13, 2016, the Company closed the December 2016 Offering. In connection with the closing, the Company issued to the placement agent, Roth, the December 2016 PA Warrants to purchase 30,834 shares of Common Stock, pursuant to the terms of the Placement Agency Agreement between the Company and Roth.

4. *February 6, 2017 PA Warrants and February 9, 2017 PA Warrants*

On February 6, 2017, the Company closed a registered offering of units. In connection with the closing, the Company issued to the placement agent, Roth, the February 6, 2017 PA Warrant to purchase 185,000 shares of Common Stock, pursuant to the terms of the Placement Agency Agreement between the Company and Roth.

On February 9, 2017, the Company closed a registered offering of units. In connection with the closing, the Company issued to the placement agent, Roth, the February 9, 2017 PA Warrant to purchase 120,000 shares of Common Stock, pursuant to the terms of the Placement Agency Agreement between the Company and Roth.

5. *January 2018 Shares of Common Stock*

On January 2, 2018, the Company entered into a Cooperation Agreement with Iroquois Capital to terminate Iroquois Capitals’ proxy campaign in opposition to the Company’s proposals for the 2017 annual meeting of shareholders. Under the agreement, the Company issued to Iroquois Master Fund LTD and Iroquois Capital Investment Group LLC 456,000 and 144,000 shares of Common Stock, respectively, as reimbursement for expenses incurred in connection with the 2017 annual meeting of shareholders and the negotiation, execution and effectuation of the agreement.

6. *January 2018 Series O Warrants and January 2018 PA Warrants*

On January 4, 2018, in connection with the January 2018 Offering, the Company issued and sold a Series O Warrant to purchase 1,600,000 shares of Common Stock to one institutional and accredited investor pursuant to the terms of the Securities Purchase Agreement, dated as of January 2, 2018, between the Company and the investor in a private placement in connection with a concurrent registered sales of shares of Common Stock and Series P Warrants to the investor. The investor paid \$1.15 per share of Common Stock and \$1.14 per share of Common Stock underlying the Series P Warrant for aggregate gross proceeds of approximately \$1.8 million. The Company received net proceeds of approximately \$1.5 million at the closing, after deducting commissions to the placement agent and estimated offering expenses payable by the Company associated with the January 2018 Offering.

On January 4, 2018, in connection with the January 2018 Offering, the Company sold and issued to the placement agent, WestPark, for an aggregate purchase price of \$100, the January 2018 PA Warrants to purchase 128,000 shares of Common Stock pursuant to the terms of the engagement letter between the Company and WestPark.

7. *April 2018 Convertible Notes, Series Q Warrants and April 2018 PA Warrants*

On April 9, 2018, the Company closed the April 2018 Offering.

Between April 9, 2018 and July 8, 2018, (i) the holders of the Series A Notes converted (a) an aggregate principal amount of \$5,670,500 into 4,500,397 shares of Common Stock, (b) an aggregate Additional Amount (as defined in the Series A Notes) of \$7,514,525 into 5,963,958 shares of Common Stock, in each case at a conversion price of \$1.26 per share, (ii) the holders of the Series B Notes converted an aggregate principal amount of \$600,000 into 476,190 shares of the Common Stock, and (iii) the holders of Series Q Warrants exercised warrants for 7,100,000 shares of Common Stock at an exercise price of \$1.12 per share.

Between July 19, 2018 and August 26, 2018, (i) the holders of the Series A Notes converted (a) an aggregate principal amount of \$22,700 into 47,341 shares of Common Stock, (b) an aggregate Additional Amount (as defined in the Series A Notes) of \$5,868,724 into 8,493,108 shares of Common Stock, (c) an aggregate Original Issue Discount (as defined in the Series A Notes) of \$25,943 into 80,493 shares of Common Stock, in each case at a conversion price of \$0.3223 per share, (ii) the holders of the Series B Notes converted (a) an aggregate principal amount of \$252,956 into 770,992 shares of the Common Stock, (b) an aggregate Additional True-Up Amount (as defined in the Series B Notes) of \$2,661,962 into 7,072,505 shares of Common Stock, in each case at a conversion price of \$0.3223 per share, and (iii) the holders of Series Q Warrants exercised warrants for 291,667 shares of Common Stock at an exercise price of \$0.3223 per share.

Between August 27, 2018 and April 9, 2019, (i) the holders of the Series A Notes converted (a) an aggregate principal amount of \$35,100 into 114,444 shares of Common Stock, (b) an aggregate Additional Amount (as defined in the Series A Notes) of \$5,403,364 into 17,617,750 shares of Common Stock, (c) an aggregate Original Issue Discount (as defined in the Series A Notes) of \$482,707 into 1,573,873 shares of Common Stock in each case at a conversion price of \$0.3067 per share, (ii) the holders of the Series B Notes converted (a) an aggregate principal amount of \$4,013,044 into 13,084,591 shares of the Common Stock, (b) an aggregate Additional True-Up Amount (as defined in the Series B Notes) of \$4,270,859 into 13,925,315 shares of Common Stock, in each case at a conversion price of \$0.3067 per share, and (iii) the holders of Series Q Warrants exercised warrants for 1,500,000 shares of Common Stock at an exercise price of \$0.3223 per share.

On April 9, 2018, in connection with the April 2018 Offering, the Company sold and issued to the placement agent, WestPark, for an aggregate purchase price of \$100, the April 2018 PA Warrants to purchase 730,159 shares of Common Stock pursuant to the terms of the engagement letter between the Company and WestPark.

8. April 2019 PA Warrants

On April 2, 2019, in connection with the Company's April 2019 Offering, the Company sold and issued to the placement agent, Dawson James., for an aggregate purchase price of \$100, the April 2019 PA Warrants to purchase 1,389,474 shares of Common Stock pursuant to the terms of the engagement letter between the Company and Dawson James.

Exemptions from Registration

Offerings numbered above as 1, 6, 7: Each of these offerings was conducted as a private placement exempt from registration under Section 4(a)(2) and Rule 506(b) promulgated by the Securities and Exchange Commission under the Securities Act of 1933, as amended (the "Securities Act"). The investors were sophisticated and represented in writing that they were accredited investors and acquired the securities for their own accounts for investment purposes. A legend was placed on the securities and will be placed on any stock certificates issued upon the exchange or conversion of securities convertible or exchangeable for the Company's Common Stock, subject to the terms of the applicable transaction documents, stating that the securities have not been registered under the Securities Act and cannot be sold or otherwise transferred without registration or an exemption therefrom.

Offerings numbered above as 1, 2, 3, 4, 5, 6, 7, 8: Each of these offerings was conducted as a private placement exempt from registration under Section 4(a)(2) of the Securities Act because the Company consummated the transactions with parties with which the Company had a pre-existing, long-standing and substantive relationship, who were sophisticated and accredited investor. A legend was placed on the securities and will be placed on any stock certificates issued upon the exchange or conversion of securities convertible or exchangeable for the Company's Common Stock, subject to the terms of the applicable transaction documents, stating that the securities have not been registered under the Securities Act and cannot be sold or otherwise transferred without registration or an exemption therefrom.

Item 16. Exhibits and Financial Statements

The exhibits to this registration statement are listed in the exhibit index attached immediately before the signature pages.

Item 17. Undertakings

The undersigned registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the SEC pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement;

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement; *provided, however*, that paragraphs (1)(i), (1)(ii) and (1)(iii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the SEC by the Registrant pursuant to Section 13 or Section 15(d) of the Exchange Act, that are incorporated by reference in this registration statement.

(2) That, for the purpose of determining any liability under the Securities Act, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(4) That, for the purpose of determining liability under the Securities Act to any purchaser, each prospectus filed pursuant to Rule 424(b) as part of a registration statement relating to an offering, other than registration statements relying on Rule 430B or other than prospectuses filed in reliance on Rule 430A, shall be deemed to be part of and included in the registration statement as of the date it is first used after effectiveness. *Provided, however*, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such first use, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such date of first use.

(5) That, for the purpose of determining liability of the registrant under the Securities Act to any purchaser in the initial distribution of the securities: The undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

(i) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;

(ii) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;

(iii) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and

(iv) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

(6) That, for purposes of determining any liability under the Securities Act, each filing of the registrant's annual report pursuant to section 13(a) or section 15(d) of the Exchange Act that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(7) Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the Registrant pursuant to the indemnification provisions described herein, or otherwise, the Registrant has been advised that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the Registrant of expenses incurred or paid by a director, officer or controlling person of the Registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the Registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

EXHIBITS INDEX

<u>Exhibit No.</u>	<u>Description</u>
<u>3.1</u>	<u>Articles of Incorporation of Real Goods Solar, Inc. (Incorporated by reference to Exhibit 3.1 to Real Goods Solar's Quarterly Report on Form 10-Q filed November 8, 2016 (Commission File No. 001-34044)).</u>
<u>3.2</u>	<u>Certificate of Designation of Preferences, Rights and Limitations of Series A 12.5% Mandatorily Convertible Preferred Stock (Incorporated by reference to Exhibit 3.2 to Real Goods Solar's Quarterly Report on Form 10-Q filed November 8, 2016 (Commission File No. 001-34044)).</u>
<u>3.3</u>	<u>Statement of Correction to Articles of Incorporation of Real Goods Solar, Inc. (Incorporated by reference to Exhibit 3.3 to Real Goods Solar, Inc.'s Quarterly Report on Form 10-Q filed May 10, 2017 (Commission File No. 001-34044)).</u>
<u>3.4†</u>	<u>Articles of Incorporation of Real Goods Solar, Inc., revised to reflect correction made by Statement of Correction to Articles of Incorporation (filed herewith).</u>
<u>3.5</u>	<u>Bylaws of Real Goods Solar, Inc. (Incorporated by reference to Exhibit 3.2 to Real Goods Solar's Amendment No. 1 to Registration Statement on Form S-1 filed March 28, 2008 (Commission File No. 333-149092)).</u>
<u>4.1</u>	<u>Form of Real Goods Solar Class A Common Stock Certificate (Incorporated by reference to Exhibit 4.1 to Real Goods Solar's Amendment No. 5 to Registration Statement on Form S-1 filed May 2, 2008 (Commission File No. 333-149092)).</u>
<u>4.2</u>	<u>Warrant, dated March 26, 2013, pursuant to the Second Loan Modification and Reinstatement Agreement, dated November 13, 2012, among Silicon Valley Bank, Real Goods Energy Tech, Inc., Real Goods Trading Corporation, Earth Friendly Energy Group Holdings, LLC, Alteris Renewables, Inc., Earth Friendly Energy Group, LLC, Solar Works, LLC, Alteris RPS, LLC, and Alteris ISI, LLC (Incorporated by reference to Exhibit 10.21 to Real Goods Solar's Annual Report on Form 10-K filed April 1, 2013 (Commission File No. 001-34044)).</u>
<u>4.3</u>	<u>Warrant, dated March 27, 2013, issued to Silicon Valley Bank pursuant to the Third Loan Modification Agreement, dated March 27, 2013, among Silicon Valley Bank, Real Goods Energy Tech, Inc., Real Goods Trading Corporation, and Alteris Renewables, Inc. (Incorporated by reference to Exhibit 10.22 to Real Goods Solar's Annual Report on Form 10-K filed April 1, 2013 (Commission File No. 001-34044)).</u>
<u>4.4</u>	<u>Form of Warrant, dated June 3, 2013, issued to the investors under the Securities Purchase Agreement, dated May 24, 2013, among Real Goods Solar, Inc. and the investors identified therein (Incorporated by reference to Exhibit 4.1 to Real Goods Solar's Current Report on Form 8-K filed June 3, 2013 (Commission File No. 001-34044)).</u>
<u>4.5</u>	<u>Form of Warrant, dated November 20, 2013, issued pursuant to the Underwriting Agreement, dated November 15, 2013 by and between the Company and Cowen and Company (Incorporated by reference to Exhibit 4.1 to Real Goods Solar's Current Report on Form 8-K filed November 21, 2013 (Commission File No. 001-34044)).</u>
<u>4.6</u>	<u>Form of Warrant, dated July 9, 2014, issued to the investors under the Securities Purchase Agreement, dated July 2, 2014, among Real Goods Solar, Inc. and the investors identified therein (Incorporated by reference to Exhibit 4.1 to Real Goods Solar's Current Report on Form 8-K filed July 3, 2014 (Commission File No. 001-34044)).</u>
<u>4.7</u>	<u>Warrant, dated June 6, 2014, issued to Silicon Valley Bank pursuant to the Joinder and Sixth Loan Modification Agreement, dated June 6, 2014, among Real Goods Energy Tech, Inc., Real Goods Trading Corporation, Alteris Renewables, Inc., Real Goods Syndicated, Inc., Mercury Energy, Inc., Real Goods Solar, Inc. - Mercury Solar, Elemental Energy, LLC, Sunetric Management LLC and Silicon Valley Bank (Incorporated by reference to Exhibit 4.1 to Real Goods Solar's Quarterly Report on Form 10-Q filed August 19, 2014 (Commission File No. 001-34044)).</u>

Exhibit No.	Description
4.8	<u>Warrant, dated November 19, 2014, issued to Silicon Valley Bank pursuant to the Seventh Loan Modification Agreement, dated November 19, 2014, among Real Goods Energy Tech, Inc., Real Goods Trading Corporation, Alteris Renewables, Inc., Real Goods Syndicated, Inc., Mercury Energy, Inc., Real Goods Solar, Inc. - Mercury Solar, Elemental Energy, LLC, Sunetric Management LLC and Silicon Valley Bank (Incorporated by reference to Exhibit 4.8 to Real Goods Solar's Annual Report on Form 10-K filed March 31, 2015 (Commission File No. 001-34044)).</u>
4.9	<u>Combined Form of Warrant issued to investors on February 26 and 27, 2015 (Incorporated by reference to Exhibit 4.1 to Real Goods Solar's Current Report on Form 8-K filed February 24, 2015 (Commission File No. 001-34044)).</u>
4.10	<u>Warrant to Purchase Common Stock dated February 27, 2015, issued to WestPark Capital, Inc. (Incorporated by reference to Exhibit 4.2 to Real Goods Solar's Quarterly Report on Form 10-Q filed May 11, 2015 (Commission File No. 001-34044)).</u>
4.11	<u>Waiver and Amendment Agreement, dated March 31, 2015, among Real Goods Solar, Inc. and the investor party thereto (Incorporated by reference to Exhibit 4.3 to Real Goods Solar's Quarterly Report on Form 10-Q filed May 11, 2015 (Commission File No. 001-34044)).</u>
4.12	<u>Form of Series F Warrant issued to investors on June 30 and July 1, 2015 (Incorporated by reference to Exhibit 4.1 to Real Goods Solar's Current Report on Form 8-K filed June 26, 2015 (Commission File No. 001-34044)).</u>
4.13	<u>Form of Warrant to Purchase Common Stock, dated June 30, 2015, issued to WestPark Capital, Inc. (Incorporated by reference to Exhibit 4.3 to Real Goods Solar's Quarterly Report on Form 10-Q filed August 10, 2015 (Commission File No. 001-34044)).</u>
4.14	<u>Form of Senior Secured Convertible Note issued to the investors under the Securities Purchase Agreement, dated April 1, 2016 (Incorporated by reference to Exhibit 4.1 to Real Goods Solar's Current Report on Form 8-K filed April 1, 2016 (Commission File No. 001-34044)).</u>
4.15	<u>Form of Series G Warrants issued to the investors under the Securities Purchase Agreement, dated April 1, 2016 (Incorporated by reference to Exhibit 4.2 to Real Goods Solar's Current Report on Form 8-K filed April 1, 2016 (Commission File No. 001-34044)).</u>
4.16†	<u>Placement Agent Warrant, dated as of April 1, 2016, issued to Roth Capital Partners, LLC.</u>
4.17	<u>Form of Termination and Amendment Agreement, dated May 12, 2016, between Real Goods Solar, Inc. and each of the investors party to the Securities Purchase Agreement, dated April 1, 2016 (Incorporated by reference to Exhibit 4.1 to Real Goods Solar's Quarterly Report on Form 10-Q filed May 12, 2016 (Commission File No. 001-34044)).</u>
4.18	<u>Form of Series H Warrant, dated September 14, 2016, issued to investors participating in the September 14, 2016 public unit offering (Incorporated by reference to Exhibit 4.17 to Amendment No. 5 to Real Goods Solar's Registration Statement on Form S-1 filed September 7, 2016 (Commission File No. 333-211915)).</u>
4.19	<u>Form of Real Goods Solar Series A 12.5% Mandatorily Convertible Preferred Stock Certificate (Incorporated by reference to Exhibit 4.18 to Amendment No. 3 to Real Goods Solar's Registration Statement on Form S-1 filed August 25, 2016 (Commission File No. 333-211915)).</u>
4.20	<u>Representative Warrant to Purchase Units Consisting of Series A 12.5% Mandatorily Convertible Preferred Stock and Series H Warrant to Purchase Common Stock, dated September 14, 2016, issued to Roth Capital Partners, LLC (Incorporated by reference to Exhibit 4.1 to Real Goods Solar's Current Report on Form 8-K filed September 14, 2016 (Commission File No. 001-34044)).</u>

Exhibit No.	Description
4.21	<u>Form of Series I Warrant, dated December 8, 2016, issued to investors party the Securities Purchase Agreement, dated December 8, 2016 (Incorporated by reference to Exhibit 4.1 to Real Goods Solar's Current Report on Form 8-K filed December 13, 2016 (Commission File No. 001-34044)).</u>
4.22	<u>Form of Series J Warrant, dated December 8, 2016, issued to investors party the Securities Purchase Agreement, dated December 8, 2016 (Incorporated by reference to Exhibit 4.2 to Real Goods Solar's Current Report on Form 8-K filed December 13, 2016 (Commission File No. 001-34044)).</u>
4.23	<u>Placement Agent Warrant, dated December 13, 2016, issued to Roth Capital Partners, LLC (Incorporated by reference to Exhibit 4.1 to Real Goods Solar's Current Report on Form 8-K filed December 14, 2016 (Commission File No. 001-34044)).</u>
4.24	<u>Form of Series K Warrant, dated February 6, 2017, issued to investors party to the Securities Purchase Agreement, dated February 1, 2017 (Incorporated by reference to Exhibit 4.1 to Real Goods Solar's Current Report on Form 8-K filed February 2, 2017 (Commission File No. 001-34044)).</u>
4.25	<u>Form of Series L Warrant, dated February 6, 2017, issued to investors party to the Securities Purchase Agreement, dated February 1, 2017 (Incorporated by reference to Exhibit 4.2 to Real Goods Solar's Current Report on Form 8-K filed February 2, 2017 (Commission File No. 001-34044)).</u>
4.26	<u>Placement Agency Warrant, dated February 6, 2017, issued to Roth Capital Partners, LLC (Incorporated by reference to Exhibit 4.1 to Real Goods Solar's Current Report on Form 8-K filed February 6, 2017 (Commission File No. 001-34044)).</u>
4.27	<u>Form of Series M Warrant, dated February 9, 2017, issued to investors party to the Securities Purchase Agreement, dated February 7, 2017 (Incorporated by reference to Exhibit 4.1 to Real Goods Solar's Amendment No. 1 Current Report on Form 8-K/A filed February 15, 2017 (Commission File No. 001-34044)).</u>
4.28	<u>Form of Series N Warrant, dated February 9, 2017, issued to investors party to the Securities Purchase Agreement, dated February 7, 2017 (Incorporated by reference to Exhibit 4.2 to Real Goods Solar's Amendment No. 1 Current Report on Form 8-K/A filed February 15, 2017 (Commission File No. 001-34044)).</u>
4.29	<u>Placement Agency Warrant, dated February 9, 2017, issued to Roth Capital Partners, LLC (Incorporated by reference to Exhibit 4.3 to Real Goods Solar's Amendment No. 1 Current Report on Form 8-K/A filed February 15, 2017 (Commission File No. 001-34044)).</u>
4.30	<u>Form of Series O Warrant, dated January 4, 2018, issued to the investor party to the Securities Purchase Agreement, dated January 2, 2018 (Incorporated by reference to Exhibit 4.1 to Real Goods Solar's Current Report on Form 8-K filed January 2, 2018 (Commission File No. 001-34044)).</u>
4.31	<u>Form of Series P Warrant, dated January 4, 2018, issued to the investor party to the Securities Purchase Agreement, dated January 2, 2018 (Incorporated by reference to Exhibit 4.2 to Real Goods Solar's Current Report on Form 8-K filed January 2, 2018 (Commission File No. 001-34044)).</u>
4.32	<u>Placement Agency Warrant, dated January 4, 2018, issued to Westpark Capital, LLC (Incorporated by reference to Exhibit 4.1 to Real Goods Solar's Current Report on Form 8-K filed January 4, 2018 (Commission File No. 001-34044)).</u>
4.33	<u>Form of Series A Senior Convertible Note, dated April 9, 2018, issued to the investors under the Securities Purchase Agreement, dated March 30, 2018 (Incorporated by reference to Exhibit 4.1 to Real Goods Solar's Current Report on Form 8-K filed April 10, 2018 (Commission File No. 001-34044)).</u>

Exhibit No.	Description
4.34	Form of Series B Senior Secured Convertible Note, dated April 9, 2018, issued to the investors under the Securities Purchase Agreement, dated March 30, 2018 (Incorporated by reference to Exhibit 4.2 to Real Goods Solar's Current Report on Form 8-K filed April 10, 2018 (Commission File No. 001-34044)).
4.35	Form of Series Q Warrants, dated April 9, 2018, issued to the investors under the Securities Purchase Agreement, dated March 30, 2018 (Incorporated by reference to Exhibit 4.3 to Real Goods Solar's Current Report on Form 8-K filed April 10, 2018 (Commission File No. 001-34044)).
4.36	Form of Secured Promissory Notes, dated April 9, 2018, issued to Real Goods Solar, Inc. under the Note Purchase Agreement, dated April 9, 2018 by each of the investors under the Securities Purchase Agreement, dated March 30, 2018 (Incorporated by reference to Exhibit 4.4 to Real Goods Solar's Current Report on Form 8-K filed April 10, 2018 (Commission File No. 001-34044)).
4.37	Form of Placement Agent Warrant, dated April 9, 2018, issued by Real Goods Solar, Inc. to WestPark Capital, Inc. (Incorporated by reference to Exhibit 4.5 to Real Goods Solar's Current Report on Form 8-K filed April 10, 2018 (Commission File No. 001-34044)).
4.38	Form of Series R Warrant, dated April 2, 2019, issued to the investors under the Securities Purchase Agreement, dated April 2, 2019 (Incorporated by reference to Exhibit 4.1 to Real Goods Solar's Current Report on Form 8-K filed April 2, 2019 (Commission File No. 001-34044)).
4.39	Form of Series S Warrant, dated April 2, 2019, issued to the investors under the Securities Purchase Agreement, dated April 2, 2019 (Incorporated by reference to Exhibit 4.2 to Real Goods Solar's Current Report on Form 8-K filed April 2, 2019 (Commission File No. 001-34044)).
4.40	Form of Placement Agent Warrant, dated as of April 4, 2019, issued to Dawson James Securities, Inc. (Incorporated by reference to Exhibit 4.1 to Real Goods Solar's Current Report on Form 8-K filed April 4, 2019 (Commission File No. 001-34044)).
5.1††	Opinion of Brownstein Hyatt Farber Schreck LLP
10.1*	Form of Real Goods Solar, Inc. Employee Stock Option Agreement (Incorporated by reference to Exhibit 10.2 to Real Goods Solar's Amendment No. 1 to Registration Statement on Form S-1 filed March 28, 2008 (Commission File No. 333-149092)).
10.2*	Amended and Restated Real Goods Solar, Inc. 2008 Long-Term Incentive Plan (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Current Report on Form 8-K filed February 12, 2018 (Commission File No. 001-34044)).
10.3	Tax Sharing and Indemnification Agreement between Real Goods Solar, Inc. and Gaiam, Inc. (Incorporated by reference to Exhibit 10.7 to Real Goods Solar's Amendment No. 3 to Registration Statement on Form S-1 filed April 17, 2008 (Commission File No. 333-149092)).
10.4	Shareholders Agreement, dated December 19, 2011, between Real Goods Solar, Inc. and Riverside Renewable Energy Investments, LLC (Incorporated by reference to Exhibit 10.4 to Real Goods Solar's Current Report on Form 8-K filed December 21, 2011 (Commission File No. 001-34044)).
10.5	First Amendment to Tax Sharing Agreement, dated December 19, 2011, between Real Goods Solar, Inc. and Gaiam, Inc. (Incorporated by reference to Exhibit 10.17 to Real Goods Solar's Annual Report on Form 10-K filed April 1, 2013 (Commission File No. 001-34044)).

Exhibit No.	Description
10.6	<u>Securities Purchase Agreement, dated May 24, 2013, among Real Goods Solar, Inc. and the investors thereunder (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Current Report on Form 8-K filed May 24, 2013 (Commission File No. 001-34044)).</u>
10.7	<u>Securities Purchase Agreement, dated July 2, 2014, among Real Goods Solar, Inc. and the investors thereunder (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Current Report on Form 8-K filed July 3, 2014 (Commission File No. 001-34044)).</u>
10.8	<u>Form of Registration Rights Agreement, dated July 9, 2014, among Real Goods Solar, Inc. and the investors under the Securities Purchase Agreement, dated July 2, 2014, among Real Goods Solar, Inc. and such investors (Incorporated by reference to Exhibit 10.2 to Real Goods Solar's Current Report on Form 8-K filed July 3, 2014 (Commission File No. 001-34044)).</u>
10.9	<u>Placement Agency Agreement, dated February 23, 2015, between Real Goods Solar, Inc. and WestPark Capital, Inc. (Incorporated by reference to Exhibit 1.1 to Real Goods Solar's Current Report on Form 8-K filed February 24, 2015 (Commission File No. 001-34044)).</u>
10.10	<u>Form of Securities Purchase Agreement, dated February 23, 2015, among Real Goods Solar, Inc. and the investors thereunder (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Current Report on Form 8-K filed February 24, 2015 (Commission File No. 001-34044)).</u>
10.11*	<u>Employment Agreement, dated June 1, 2015, between Real Goods Solar, Inc. and Dennis Lacey (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Current Report on Form 8-K filed June 3, 2015 (Commission File No. 001-34044)).</u>
10.12*	<u>Form of Employee Stock Option Agreement (Incorporated by reference to Exhibit 10.2 to Real Goods Solar's Current Report on Form 8-K filed June 3, 2015 (Commission File No. 001-34044)).</u>
10.13	<u>Placement Agency Agreement, dated June 25, 2015, between Real Goods Solar, Inc. and WestPark Capital, Inc. (Incorporated by reference to Exhibit 1.1 to Real Goods Solar's Current Report on Form 8-K filed June 26, 2015 (Commission File No. 001-34044)).</u>
10.14	<u>Form of Securities Purchase Agreement, dated June 25, 2015, among Real Goods Solar, Inc. and the investors party thereto (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Current Report on Form 8-K filed June 26, 2015 (Commission File No. 001-34044)).</u>
10.15	<u>Securities Purchase Agreement, dated April 1, 2016, among Real Goods Solar, Inc. and the investors party thereto (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Current Report on Form 8-K filed April 1, 2016 (Commission File No. 001-34044)).</u>
10.16	<u>Registration Rights Agreement, dated April 1, 2016, among Real Goods Solar, Inc. and the investors party thereto (Incorporated by reference to Exhibit 10.2 to Real Goods Solar's Current Report on Form 8-K filed April 1, 2016 (Commission File No. 001-34044)).</u>
10.17	<u>Placement Agency Agreement, dated December 8, 2016, among Real Goods Solar, Inc., Roth Capital Partners, LLC and WestPark Capital, Inc. (Incorporated by reference to Exhibit 1.1 to Real Goods Solar's Current Report on Form 8-K filed December 13, 2016 (Commission File No. 001-34044)).</u>
10.18	<u>Form of Securities Purchase Agreement, dated December 8, 2016, among Real Goods Solar, Inc. and the purchasers party thereto (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Current Report on Form 8-K filed December 13, 2016 (Commission File No. 001-34044)).</u>

Exhibit No.	Description
10.19	<u>Form of Leak-Out Agreement, dated December 8, 2016, entered into by \$10,000 or greater investors party to the Securities Purchase Agreement, dated December 8, 2016 (Incorporated by reference to Exhibit 10.2 to Real Goods Solar's Current Report on Form 8-K filed December 13, 2016 (Commission File No. 001-34044)).</u>
10.20	<u>Form of Amendment to Securities Purchase Agreement, dated December 12, 2016, among Real Goods Solar, Inc. and the purchasers party thereto (Incorporated by reference to Exhibit 10.3 to Real Goods Solar's Current Report on Form 8-K filed December 13, 2016 (Commission File No. 001-34044)).</u>
10.21	<u>Placement Agency Agreement, dated February 1, 2017, between Real Goods Solar, Inc. and Roth Capital Partners, LLC (Incorporated by reference to Exhibit 1.1 to Real Goods Solar's Current Report on Form 8-K filed February 2, 2017 (Commission File No. 001-34044)).</u>
10.22	<u>Form of Securities Purchase Agreement, dated February 1, 2017, among Real Goods Solar, Inc. and the purchasers party thereto (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Current Report on Form 8-K filed February 2, 2017 (Commission File No. 001-34044)).</u>
10.23	<u>Form of Leak-Out Agreement, dated February 1, 2017, among Real Goods Solar, Inc. and certain purchasers party to the Securities Purchase Agreement, dated February 1, 2017 (Incorporated by reference to Exhibit 10.2 to Real Goods Solar's Current Report on Form 8-K filed February 2, 2017 (Commission File No. 001-34044)).</u>
10.24	<u>Placement Agency Agreement, dated February 7, 2017, between Real Goods Solar, Inc. and Roth Capital Partners, LLC (Incorporated by reference to Exhibit 1.1 to Real Goods Solar's Current Report on Form 8-K filed February 8, 2017 (Commission File No. 001-34044)).</u>
10.25	<u>Form of Securities Purchase Agreement, dated February 7, 2017, among Real Goods Solar, Inc. and the purchasers party thereto (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Amendment No. 1 Current Report on Form 8-K/A filed February 15, 2017 (Commission File No. 001-34044)).</u>
10.26	<u>Form of Leak-Out Agreement, dated February 7, 2017, among Real Goods Solar, Inc. and certain purchasers party to the Securities Purchase Agreement, dated February 7, 2017 (Incorporated by reference to Exhibit 10.2 to Real Goods Solar's Current Report on Form 8-K filed February 8, 2017 (Commission File No. 001-34044)).</u>
10.27	<u>Master Services Agreement, dated May 23, 2017, between Real Goods Solar, Inc. and Mobomo, LLC (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Quarterly Report on Form 10-Q filed August 14, 2017 (Commission File No. 001-34044)).</u>
10.28	<u>Statement of Work, dated May 24, 2017, between Real Goods Solar, Inc. and Mobomo, LLC (Incorporated by reference to Exhibit 10.2 to Real Goods Solar's Quarterly Report on Form 10-Q filed August 14, 2017 (Commission File No. 001-34044)).</u>
10.29	<u>Technology License Agreement, dated September 29, 2017, by and between Real Goods Solar, Inc. and Dow Global Technologies LLC (Incorporated by reference to Exhibit 10.1 to Real Goods Solar, Inc.'s Current Report on Form 8-K filed October 4, 2017 (Commission File No. 001-34044)).</u>
10.30	<u>Engagement Agreement, dated December 13, 2017, among Real Goods Solar, Inc. and WestPark Capital, Inc. (Incorporated by reference to Exhibit 1.1 to Real Goods Solar, Inc.'s Current Report on Form 8-K filed January 2, 2018 (Commission File No. 001-34044)).</u>

Exhibit No.	Description
10.31	<u>Form of Securities Purchase Agreement, dated January 2, 2018, between Real Goods Solar, Inc. and the purchaser party thereto (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Current Report on Form 8-K filed January 2, 2018 (Commission File No. 001-34044)).</u>
10.32	<u>Cooperation Agreement dated January 2, 2018, between Real Goods Solar, Inc. and Iroquois Capital Management LLC, Iroquois Master Fund LTD, Iroquois Capital Investment Group LLC, Richard Abbe and Kimberly Page (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Current Report on Form 8-K filed January 3, 2018 (Commission File No. 001-34044)).</u>
10.33*	<u>Amended and Restated Real Goods Solar, Inc. 2008 Long-Term Incentive Plan (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Current Report on Form 8-K filed February 12, 2018 (Commission File No. 001-34044)).</u>
10.34	<u>Placement Agency Agreement, dated January 29, 2018, between Real Goods Solar, Inc. and WestPark Capital, Inc. (Incorporated by reference to Exhibit 1.1 to Real Goods Solar's Quarterly Report on Form 10-Q filed August 14, 2018 (Commission File No. 001-34044)).</u>
10.35	<u>Securities Purchase Agreement, dated March 30, 2018, among Real Goods Solar, Inc. and the investor parties thereto (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Current Report on Form 8-K filed April 2, 2018 (Commission File No. 001-34044)).</u>
10.36	<u>Form of Amendment No. 1 to Securities Purchase Agreement, dated April 9, 2018, between Real Goods Solar, Inc. and each of the investors under the Securities Purchase Agreement, dated March 30, 2018 (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Current Report on Form 8-K filed April 10, 2018 (Commission File No. 001-34044)).</u>
10.37	<u>Registration Rights Agreement, dated April 9, 2018, among Real Goods Solar, Inc. and the investors under the Securities Purchase Agreement, dated March 30, 2018 (Incorporated by reference to Exhibit 10.2 to Real Goods Solar's Current Report on Form 8-K filed April 10, 2018 (Commission File No. 001-34044)).</u>
10.38	<u>Form of Note Purchase Agreement, dated April 9, 2018, between Real Goods Solar, Inc. and each of the investors under the Securities Purchase Agreement, dated March 30, 2018 (Incorporated by reference to Exhibit 10.3 to Real Goods Solar's Current Report on Form 8-K filed April 10, 2018 (Commission File No. 001-34044)).</u>
10.39	<u>Form of Master Netting Agreement, dated April 9, 2018, between Real Goods Solar, Inc. and each of the investors under the Securities Purchase Agreement, dated March 30, 2018 (Incorporated by reference to Exhibit 10.4 to Real Goods Solar's Current Report on Form 8-K filed April 10, 2018 (Commission File No. 001-34044)).</u>
10.40	<u>Registration Rights Agreement, dated June 5, 2018, among Real Goods Solar, Inc., Iroquois Master Fund Ltd. and Iroquois Capital Investment Group LLC (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Current Report on Form 8-K filed June 7, 2018 (Commission File No. 001-34044)).</u>
10.41*	<u>Real Goods Solar, Inc. 2018 Long-Term Incentive Plan (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Current Report on Form 8-K filed June 21, 2018 (Commission File No. 001-34044)).</u>
10.42*	<u>Form of Real Goods Solar, Inc. Employee Stock Option Agreement (Incorporated by reference to Exhibit 10.2 to Real Goods Solar's Current Report on Form 8-K filed June 21, 2018 (Commission File No. 001-34044)).</u>
10.43	<u>Form of Letter Agreement, dated August 29, 2018, between Real Goods Solar, Inc. and each holder of Series A Senior Convertible Notes and Series B Senior Secured Convertible Notes, in each case due April 9, 2019 (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Current Report on Form 8-K filed August 29, 2018 (Commission File No. 001-34044)).</u>

Exhibit No.	Description
<u>10.44*</u>	<u>Form of Change in Control Agreement entered into on November 14, 2018 between Real Goods Solar, Inc. and each of, among others, Alan Fine and Nicolle Dorsey (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Current Report on Form 8-K filed November 20, 2018 (Commission File No. 001-34044)).</u>
<u>10.45*</u>	<u>Amendment to Employment Agreement, dated November 19, 2018, between Real Goods Solar, Inc. and Dennis Lacey (Incorporated by reference to Exhibit 10.2 to Real Goods Solar's Current Report on Form 8-K filed November 20, 2018 (Commission File No. 001-34044)).</u>
<u>10.46*</u>	<u>Real Goods Solar, Inc. 2019 Incentive Compensation Plan (Incorporated by reference to Exhibit 10.3 to Real Goods Solar's Current Report on Form 8-K filed November 20, 2018 (Commission File No. 001-34044)).</u>
<u>10.47*</u>	<u>Real Goods Solar, Inc. 2019 One-Time Special Discretionary Bonus Plan (Incorporated by reference to Exhibit 10.4 to Real Goods Solar's Current Report on Form 8-K filed November 20, 2018 (Commission File No. 001-34044)).</u>
<u>10.48</u>	<u>Engagement Letter, dated March 19, 2019, among Real Goods Solar, Inc. and Dawson James Securities, Inc. (Incorporated by reference to Exhibit 1.1 to Real Goods Solar's Current Report on Form 8-K filed April 2, 2019 (Commission File No. 001-34044)).</u>
<u>10.49</u>	<u>Form of Securities Purchase Agreement, dated April 2, 2019, among Real Goods Solar, Inc. and the purchasers party thereto (Incorporated by reference to Exhibit 10.1 to Real Goods Solar's Current Report on Form 8-K filed April 2, 2019 (Commission File No. 001-34044)).</u>
<u>10.50</u>	<u>Form of Leak-Out Agreement (Incorporated by reference to Exhibit 10.2 to Real Goods Solar's Current Report on Form 8-K filed April 2, 2019 (Commission File No. 001-34044)).</u>
<u>10.51</u>	<u>Form of Indemnification Agreement and schedule of directors and officers who have entered into such agreement (Incorporated by reference to Exhibit 10.2 to Real Goods Solar's Quarterly Report on Form 10-Q filed November 14, 2012 (Commission File No. 001-34044)).</u>
<u>21.1</u>	<u>Subsidiaries of the Registrant (Incorporated by reference to Exhibit 21.1 to Real Goods Solar's Annual Report on Form 10-K filed April 2, 2018 (Commission File No. 001-34044)).</u>
23.1††	Consent of Brownstein Hyatt Farber Schreck, LLP (included in Exhibit 5.1)
<u>23.2†</u>	<u>Consent of BDO USA, LLP</u>
<u>23.3†</u>	<u>Consent of Moss Adams LLP</u>
<u>24.1</u>	<u>Power of Attorney (included on the signature page to this Registration Statement)</u>
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema
101.CAL	XBRL Taxonomy Extension Calculation Linkbase
101.DEF	XBRL Taxonomy Extension Definition Linkbase
101.LAB	XBRL Taxonomy Extension Label Linkbase
101.PRE	XBRL Taxonomy Extension Presentation Linkbase

* Indicates management contract or compensatory plan or arrangement.

† Filed herewith

†† To be filed by amendment

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Denver, State of Colorado, on April 15, 2019.

Real Goods Solar, Inc.

/s/ Dennis Lacey

By: Dennis Lacey
Chief Executive Officer and Director
(Principal Executive Officer)

KNOW ALL PEOPLE BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Dennis Lacey and Alan Fine, and each of them severally, as his or her true and lawful attorneys-in-fact and agents, each acting alone with full power of substitution and resubstitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign any or all amendments (including pre-effective and post-effective amendments) and exhibits to this Registration Statement on Form S-1, and to any registration statement relating to the same offering of securities that are filed pursuant to Rule 462 of the Securities Act of 1933, as amended, and to file the same, with all exhibits thereto, and all other documents in connection therewith, with the SEC, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any of them, or theirs or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Ian Bowles</u>	Ian Bowles, Chairman of the Company's Board of Directors	April 15, 2019
<u>/s/ Dennis Lacey</u>	Dennis Lacey, Chief Executive Officer and Director (Principal Executive Officer)	April 15, 2019
<u>/s/ Alan Fine</u>	Alan Fine, Chief Financial Officer and Treasurer	April 15, 2019
<u>/s/ Nicolle Dorsey</u>	Nicolle Dorsey, Principal Accounting Officer and Controller	April 15, 2019
<u>/s/ Pavel Bouska</u>	Pavel Bouska, Director	April 15, 2019
<u>/s/ Robert L. Scott</u>	Robert L. Scott, Director	April , 2019

ARTICLES OF INCORPORATION
OF
REAL GOODS SOLAR, INC.

ARTICLE I
NAME

The name of the Corporation shall be Real Goods Solar, Inc.

ARTICLE II
CORPORATE PURPOSE

The nature of the business of the Corporation and the objects and purpose to be transacted, promoted, and carried on by it are to engage generally in any lawful business.

ARTICLE III
DURATION

The Corporation shall have perpetual existence.

ARTICLE IV
SHARES OF STOCK

A. Authorized Capital Stock. The aggregate number of shares that the Corporation shall have authority to issue is two hundred fifty million (250,000,000), consisting of one hundred fifty million (150,000,000) shares of Class A Common Stock, par value \$.0001 per share, fifty million (50,000,000) shares of Class B Common Stock, par value \$.0001 per share, and fifty million (50,000,000) shares of Preferred Stock, par value \$.0001 per share (the "Preferred Stock"). The Class A Common Stock and Class B Common Stock are sometimes referred to in these Articles as the "Common Stock". References to these "Articles" shall be understood to mean these Articles of Incorporation as set forth herein and as amended from time to time hereafter in accordance with the provisions of these Articles and of applicable law.

B. Preemptive Rights. Unless subsequently granted by the Board of Directors, shareholders of the Common Stock of the Corporation shall not have the preemptive right to acquire unissued shares or securities convertible into such shares or carrying a right to subscribe to or acquire shares. Such provisions shall apply to both shares outstanding and to newly issued shares.

C. Dividends. No dividends or any other distribution may be paid or declared or set aside for Class B Common Stock unless an equal amount is paid or declared or set aside for the Class A Common Stock, and no dividends or any other distribution may be paid or declared or set aside for Class A Common Stock unless an equal amount is paid or declared or set aside for the Class B Common Stock. In the case of dividends or other distributions payable in Common Stock of the Corporation or any of its subsidiaries, such distributions or dividends shall be in the same proportion with respect to each class of Common Stock, but only shares of Class A Common Stock (or common stock of a subsidiary which shall be identical in all material respects to Class A Common Stock) shall be distributed with respect to Class A Common Stock and only shares of Class B Common Stock (or common stock of a subsidiary which shall be identical in all material respects to Class B Common Stock) shall be distributed with respect to Class B Common Stock. In the case of any combination or reclassification of Class A Common Stock, the shares of Class B Common Stock shall also be combined or reclassified so that the relationship between the number of shares of Class B Common Stock and Class A Common Stock outstanding immediately following such combination or reclassification shall be the same as the relationship between the Class B Common Stock and the Class A Common Stock immediately prior to such combination or reclassification.

D. Voting. Each holder of Class A Common Stock shall have one (1) vote on all matters submitted to shareholders for each share of Class A Common Stock standing in the name of such holder on the books of the Corporation. Each holder of Class B Common Stock shall have ten (10) votes on all matters submitted to shareholders for each share of Class B Common Stock standing in the name of such holder on the books of the Corporation. Except as otherwise provided in these Articles or as otherwise provided by law, all shares of Common Stock of the Corporation entitled to vote shall vote as a single group on all matters submitted to the shareholders. Following the initial issuance of shares of Class B Common Stock, the Corporation may not issue any additional shares of Class B Common Stock (except in connection with stock splits and stock dividends) and the provisions of these Articles relating to the rights of the Class B Common Stock may not be amended unless and until such action is authorized by the holders of a majority of the voting power of the shares of Class A Common Stock and of Class B Common Stock entitled to vote, each voting separately as a class. In the election of directors, cumulative voting shall not be allowed.

E. Quorum and Voting Requirements. At all meetings of the shareholders, the holders of a majority of the votes eligible to be cast shall constitute a quorum. The provisions of Section 7-107-206 of the Colorado Business Corporation Act shall govern voting requirements for shareholders. Any action required or permitted by Articles 101 to 117 of the Colorado Business Corporation Act to be taken at a shareholders' meeting may be taken without a meeting if shareholders holding shares having not less than the minimum number of votes that would be necessary to authorize or take such action at a meeting at which all of the shares entitled to vote thereon were present and voted consent to such action in writing.

F. Liquidation. In the event of either an involuntary or a voluntary liquidation or dissolution of the Corporation, the holders of Class A and Class B Common Stock shall share ratably all assets and surplus funds of the Corporation available for distribution to the holders of Common Stock.

G. Provisions Relating to Transfer of the Class B Common Stock.

1. Permitted Transfers. The holder of record of Class B Common Stock (a "Class B Holder") may transfer all or any part of the shares of Class B Common Stock held by it provided, that the Corporation shall not effect such transfer unless the Class B Holder shall have elected in writing either (i) to transfer such shares as shares of Class B Common Stock or (ii) to convert such shares into shares of Class A Common Stock simultaneously with such transfer in accordance with the terms of Section H of this Article IV. No change in control, merger, consolidation, reorganization or similar transaction affecting a Class B Holder that is a corporation or partnership shall be deemed to be a transfer of the shares of Class B Common Stock.

2. Pledge. A Class B Holder may pledge such holder's shares of Class B Common Stock to a pledgee pursuant to a bona fide pledge of such shares as collateral security for indebtedness due to the pledgee, provided that such shares shall not be transferred to or registered in the name of the pledgee and shall remain subject to the provisions of this Section G. In the event of foreclosure or other similar action by the pledgee, such pledged shares of Class B Common Stock may only be transferred pursuant to the terms of Section G(1) hereof.

3. Record Holder. Shares of Class B Common Stock shall not be registered in "street" or "nominee" name. The Corporation shall note on the certificates for shares of Class B Common Stock the restrictions on transfer imposed by this Section G.

H. Conversion Rights. Subject to the terms and conditions of this Section H, each share of Class B Common Stock shall be convertible at any time or from time to time at the option of a Class B Holder into one (1) share of Class A Common Stock. At any time when the holders of a majority of the outstanding shares of Class B Common Stock approve the conversion of all or part of the Class B Common Stock into Class A Common Stock, then each outstanding share of Class B Common Stock designated for conversion shall be converted into one (1) share of Class A Common Stock as of the close of business on the date approved by the holders of a majority of the outstanding shares of Class B Common Stock.

1. Conversion Procedure. A Class B Holder desiring conversion shall (a) surrender the certificate or certificates evidencing the Class B Common Stock being converted, duly endorsed by such Class B Holder to the Corporation or in blank or accompanied by proper instruments of transfer to the Corporation, and (b) give written notice to the Corporation that such Class B Holder elects to convert such Class B Holder's Class B Common Stock. As soon as practicable after receipt of such notice and deposit of such certificate, the Corporation shall issue and deliver to the converting Class B Holder a certificate or certificates, or evidence of uncertificated shares, for the number of full shares of Class A Common Stock to which the Class B Holder shall be entitled pursuant to this Section H. Such conversion shall be deemed to have been made as of the close of business on the date upon which the Corporation receives such notice and deposit, and the person or persons entitled to receive the Class A Common Stock issuable upon conversion of such Class B Common Stock shall be treated for all purposes as the record holder or holders of such Class A Common Stock as of the close of business on such date.

2. Reservation of Class A Common Stock. The Corporation shall at all times reserve and keep available, solely for the purpose of issuing Class A Common Stock upon conversion of the outstanding shares of Class B Common Stock, such number of shares of Class A Common Stock as shall be issuable upon the conversion of all such outstanding shares of Class B Common Stock. All shares of Class A Common Stock which shall be issued upon conversion of the shares of Class B Common Stock, will, upon issuance, be fully paid and nonassessable. All shares of Class B Common Stock converted into Class A Common Stock shall be cancelled and restored to the status of authorized but unissued shares of Class B Common Stock.

I. Preferred Stock. The Board of Directors is expressly authorized, at any time and from time to time, to provide for the issuance of shares of Preferred Stock in one or more series or classes, with such designations, preferences, limitations and relative rights as shall be expressed in articles of amendment to these Articles, which shall be adopted by the Board of Directors and shall be effective without shareholder action, as provided in Section 7-106-102 of the Colorado Business Corporation Act; provided, however, that the Board of Directors shall not issue or authorize any voting Preferred Stock without the consent or approval of a majority of the Class B Common Stock.

ARTICLE V
DIRECTORS

The number of persons constituting the Board of Directors of the Corporation shall be fixed by the Bylaws of the Corporation. Directors need not be residents of the State of Colorado or shareholders of the Corporation and shall exercise all the powers conferred on the Corporation by these Articles and by the laws of the State of Colorado.

ARTICLE VI
INDEMNIFICATION

The Corporation shall indemnify its directors and officers to the fullest extent authorized or permitted by law, as now or hereafter in effect, and such right to indemnification shall continue as to a person who has ceased to be a director or officer of the Corporation and shall inure to the benefit of his or her heirs, executors and personal and legal representatives; provided, however, that except for proceedings to enforce rights to indemnification, the Corporation shall not be obligated to indemnify any director or officer (or his or her heirs, executors or personal or legal representatives) in connection with a proceeding (or part thereof) initiated by such person unless such proceeding (or part thereof) was authorized or consented to by the Board of Directors or the shareholders representing a majority of the Common Stock. The right to indemnification conferred by this Article VI shall include the right to be paid by the Corporation the expenses incurred in defending or otherwise participating in any proceeding in advance of its final disposition.

The Corporation may, to the extent authorized from time to time by the Board of Directors, provide rights to indemnification and to the advancement of expenses to employees and agents of the Corporation similar to those conferred in this Article to the directors and officers of the Corporation.

The rights to indemnification and to the advance of expenses conferred in this Article shall not be exclusive of any other right which any person may have or hereafter acquire under these Articles, the Bylaws of the Corporation, any statute, agreement, vote of shareholders or disinterested directors or otherwise.

Any repeal or modification of this Article by the shareholders of the Corporation shall not adversely affect any rights to indemnification and to the advancement of expenses of a director or officer of the Corporation existing at the time of such repeal or modification with respect to any acts or omissions occurring prior to such repeal or modification.

ARTICLE VII
LIMITATION ON DIRECTOR'S LIABILITY

A director's personal liability to the Corporation or its shareholders is limited to the fullest extent permitted by the Colorado Business Corporation Act, as amended from time to time. Any limitation on liability in effect prior to the date of these Articles shall remain in full force and effect. Any repeal or modification of this Article VII shall not adversely affect any right or protection of a director hereunder existing at the time of such repeal or modification.

ARTICLE VIII
OFFICES

A. Registered Agent. The street address of the initial registered office of the Corporation is 1560 Broadway, Denver, Colorado 80202. The name of its initial registered agent at such address is Corporation Service Company.

B. Principal Office. The address of the Corporation's initial principal office is 360 Interlocken Boulevard, Broomfield, Colorado 80021.

ARTICLE IX
INCORPORATOR

The name and mailing address of the sole incorporator and the individual causing these Articles to be delivered for filing are Thomas R. Stephens, 1899 Wynkoop Street, Suite 800, Denver, Colorado 80202.

NEITHER THE ISSUANCE AND SALE OF THE SECURITIES REPRESENTED BY THIS CERTIFICATE NOR THE SECURITIES INTO WHICH THESE SECURITIES ARE EXERCISABLE HAVE BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED, OR APPLICABLE STATE SECURITIES LAWS. THE SECURITIES MAY NOT BE OFFERED FOR SALE, SOLD, TRANSFERRED OR ASSIGNED (I) IN THE ABSENCE OF (A) AN EFFECTIVE REGISTRATION STATEMENT FOR THE SECURITIES UNDER THE SECURITIES ACT OF 1933, AS AMENDED, OR (B) AN OPINION OF COUNSEL SELECTED BY THE HOLDER, IN A GENERALLY ACCEPTABLE FORM, THAT REGISTRATION IS NOT REQUIRED UNDER SAID ACT OR (II) UNLESS SOLD PURSUANT TO RULE 144 OR RULE 144A UNDER SAID ACT. NOTWITHSTANDING THE FOREGOING, THE SECURITIES MAY BE PLEDGED IN CONNECTION WITH A BONA FIDE MARGIN ACCOUNT OR OTHER LOAN OR FINANCING ARRANGEMENT SECURED BY THE SECURITIES.

REAL GOODS SOLAR, INC.

Placement Agent Warrant To Purchase Common Stock

Warrant No.: WPA3-1

Number of Shares of Common Stock: 846,508

Date of Issuance: April 1, 2016 ("**Issuance Date**")

Real Goods Solar, Inc., a Colorado corporation (the "**Company**"), hereby certifies that, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, ROTH CAPITAL PARTNERS, LLC, the registered holder hereof or its permitted assigns (the "**Holder**"), is entitled, subject to the terms set forth below, to purchase from the Company, at the Exercise Price (as defined below) then in effect, at any time or times on or after the date that is six (6) months after the Issuance Date (the "**Initial Exercisability Date**"), but not after 11:59 p.m., New York time, on the Expiration Date, (as defined below), up to such number of fully paid and nonassessable shares of Common Stock equal to EIGHT HUNDRED FORTY SIX THOUSAND FIVE HUNDRED EIGHT (846,508) (the "**Warrant Share Number**"), subject to adjustment as provided herein (the "**Warrant Shares**"). Except as otherwise defined herein, capitalized terms in this Warrant to Purchase Common Stock (including any warrants to Purchase Common Stock issued in exchange, transfer or replacement hereof, this "**Warrant**"), shall have the meanings set forth in Section 17. Capitalized terms used herein and not otherwise defined shall have the definitions ascribed to such terms in the Securities Purchase Agreement.

1. EXERCISE OF WARRANT.

(a) Mechanics of Exercise. Subject to the terms and conditions hereof (including, without limitation, the limitations set forth in Section 1(f)), this Warrant may be exercised by the Holder at any time or times on or after the Initial Exercisability Date, in whole or in part, by (i) delivery of a written notice, in the form attached hereto as Exhibit A (the "**Exercise Notice**"), of the Holder's election to exercise this Warrant and (ii) (A) payment to the Company of an amount equal to the applicable Exercise Price multiplied by the number of Warrant Shares as to which this Warrant is being exercised (the "**Aggregate Exercise Price**") in cash by wire transfer of immediately available funds or (B) if the provisions of Section 1(d) are applicable, by notifying the Company that this Warrant is being exercised pursuant to a Cashless Exercise (as defined in Section 1(d)). The Holder shall not be required to deliver the original Warrant in order to effect an exercise hereunder. Execution and delivery of the Exercise Notice with respect to less than all of the Warrant Shares shall have the same effect as cancellation of the original Warrant and issuance of a new Warrant evidencing the right to purchase the remaining number of Warrant Shares. Execution and delivery of an Exercise Notice for all of the then remaining Warrant Shares shall have the same effect as cancellation of the original of this Warrant after delivery of the Warrant Shares in accordance with the terms hereof. On or before the first (1st) Trading Day following the date on which the Company has received the Exercise Notice, the Company shall transmit by facsimile an acknowledgment of confirmation of receipt of the Exercise Notice to the Holder and the Company's transfer agent (the "**Transfer Agent**"). On or before the third (3rd) Trading Day following the date on which the Company has received the Exercise Notice, so long as the Holder delivers the Aggregate Exercise Price (or notice of a Cashless Exercise) on or prior to the second (2nd) Trading Day following the date on which the Company has received the Exercise Notice (the "**Share Delivery Date**") (provided that if the Aggregate Exercise Price has not been delivered by such date, the Share Delivery Date shall be one (1) Trading Day after the Aggregate Exercise Price (or notice of a Cashless Exercise) is delivered), the Company shall (X) provided that the Warrant Shares can be immediately sold or transferred by the Holder either (1) pursuant to an effective registration statement, (2) pursuant to Rule 144 if the Holder indicates on the applicable Exercise Notice that the shares of Common Stock issuable in connection with such Exercise Notice are being sold contemporaneously by the Holder, or (3) pursuant to Rule 144 without having to comply with the information requirements under Rule 144(c)(1), credit such aggregate number of Warrant Shares to which the Holder is entitled pursuant to such exercise to the Holder's or its designee's balance account with The Depository Trust Company ("**DTC**") through its Deposit / Withdrawal At Custodian system, or (Y) otherwise, issue and dispatch by overnight courier to the address as specified in the Exercise Notice, a certificate, registered in the Company's share register in the name of the Holder or its designee, for the number of Warrant Shares to which the Holder is entitled pursuant to such exercise. The Company shall be responsible for all fees and expenses of the Transfer Agent and all fees and expenses with respect to the issuance of Warrant Shares via DTC, if any. Upon delivery of the Exercise Notice, the Holder shall be deemed for all corporate purposes to have become the holder of record of the Warrant Shares with respect to which this Warrant has been exercised, irrespective of the date such Warrant Shares are credited to the Holder's DTC account or the date of delivery of the certificates evidencing such Warrant Shares, as the case may be. If this Warrant is submitted in connection with any exercise pursuant to this Section 1(a) and the number of Warrant Shares represented by this Warrant submitted for exercise is greater than the number of Warrant Shares being acquired upon an exercise, then the Company shall as soon as practicable and in no event later than three (3) Trading Days after any exercise and at its own expense, issue a new Warrant (in accordance with Section 7(d)) representing the right to purchase the number of Warrant Shares issuable immediately prior to such exercise under this Warrant, less the number of Warrant Shares with respect to which this Warrant is exercised. No fractional Warrant Shares are to be issued upon the exercise of this Warrant, but rather the number of Warrant Shares to be issued shall be rounded up to the nearest whole number. The Company shall pay any and all taxes (other than the Holder's income taxes) which may be payable with respect to the issuance and delivery of Warrant Shares upon exercise of this Warrant. The Company's obligations to issue and deliver Warrant Shares in accordance with the terms and subject to the conditions hereof are absolute and unconditional, irrespective of any action or inaction by the Holder to enforce the same, any waiver or consent with respect to any provision hereof, the recovery of any judgment against any Person or any action to enforce the same, or any setoff, counterclaim, recoupment, limitation or termination. **NOTWITHSTANDING ANY PROVISION OF THIS WARRANT TO THE CONTRARY, NO MORE THAN THE MAXIMUM ELIGIBILITY NUMBER OF WARRANT SHARES SHALL BE EXERCISABLE HEREUNDER.**

(b) Exercise Price. For purposes of this Warrant, "**Exercise Price**" means \$0.8280, subject to adjustment as provided herein.

(c) Company's Failure to Timely Deliver Securities. If (I) the Company shall fail for any reason or for no reason on or prior to the applicable Share Delivery Date, to credit the Holder's balance account with DTC or issue and deliver a certificate to the Holder and register such shares of Common Stock on the Company's share register, as required pursuant to the terms of Section 1(a), for such number of shares of Common Stock to which the Holder is entitled upon the Holder's exercise of this Warrant, or (II) if the Company shall fail for any reason or for no reason to issue and deliver a certificate to the Holder and register such shares of Common Stock on the Company's share register or credit the Holder's balance account with DTC, as required pursuant to the terms of Section 1(a), for the number of shares of Common Stock to which the Holder is entitled pursuant to the Company's obligation pursuant to clause (ii) below, and if on or after such Trading Day the Holder (or any other Person in respect, or on behalf, of the Holder) purchases (in an open market transaction or otherwise) shares of Common Stock to deliver in satisfaction of a sale by the Holder of all or any portion of the number of shares of Common Stock equal to or any portion of the number of shares of Common Stock issuable upon such exercise that the Holder anticipated receiving from the Company (a "**Buy-In**"), then, in addition to all other remedies available to the Holder, the Company shall, within three (3) Trading Days after the Holder's request and in the Holder's discretion, either (i) pay cash to the Holder in an amount equal to the Holder's total purchase price (including brokerage commissions and other out-of-pocket expenses, if any) for the shares of Common Stock so purchased (the "**Buy-In Price**"), at which point the Company's obligation to deliver such certificate (and to issue such shares of Common Stock) or credit such Holder's balance account with DTC for such shares of Common Stock shall terminate, or (ii) promptly honor its obligation to deliver to the Holder a certificate or certificates representing such shares of Common Stock or credit such Holder's balance account with DTC, as applicable, and pay cash to the Holder in an amount equal to the excess (if any) of the Buy-In Price over the product of (A) such number of shares of Common Stock, times (B) any trading price of the Common Stock selected by the Holder in writing as in effect at any time during the period beginning on the date of the applicable Exercise Notice and ending on the date of such issuance and payment under this Section 3(c). Nothing shall limit the Holder's right to pursue any other remedies available to it hereunder, at law or in equity, including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Company's failure to timely deliver certificates representing shares of Common Stock (or to electronically deliver such shares of Common Stock) upon the exercise of this Warrant as required pursuant to the terms hereof.

(d) Cashless Exercise. Notwithstanding anything contained herein to the contrary, the Holder may, in its sole discretion, exercise this Warrant in whole or in part and, in lieu of making the cash payment otherwise contemplated to be made to the Company upon such exercise in payment of the Aggregate Exercise Price, elect instead to receive upon such exercise the "Net Number" of shares of Common Stock determined according to the following formula (a "**Cashless Exercise**"):

$$\text{Net Number} = \frac{(A \times B) - (A \times C)}{D}$$

For purposes of the foregoing formula:

A= the total number of shares with respect to which this Warrant is then being exercised.

B= the arithmetic average of the Closing Sale Prices of the Common Stock for the five (5) consecutive Trading Days ending on the date immediately preceding the date of the Exercise Notice.

C= the Exercise Price then in effect for the applicable Warrant Shares at the time of such exercise.

D= the Closing Sale Price of the Common Stock on the date of the Exercise Notice.

For purposes of Rule 144(d) promulgated under the 1933 Act, as in effect on the date hereof, the Warrant Shares issued in a Cashless Exercise shall be deemed to have been acquired by the Holder, and the holding period for the Warrant Shares shall be deemed to have commenced, on the date this Warrant was originally issued pursuant to the Securities Purchase Agreement.

(e) Disputes. In the case of a dispute as to the determination of the Exercise Price or the arithmetic calculation of the Warrant Shares, the Company shall promptly issue to the Holder the number of Warrant Shares that are not disputed and resolve such dispute in accordance with Section 12.

(f) Beneficial Ownership Limitation on Exercises. Notwithstanding anything to the contrary contained herein, the Company shall not effect the exercise of any portion of this Warrant, and the Holder shall not have the right to exercise any portion of this Warrant, pursuant to the terms and conditions of this Warrant and any such exercise shall be null and void and treated as if never made, to the extent that after giving effect to such exercise, the Holder together with the other Attribution Parties collectively would beneficially own in excess of 9.99% (the "**Maximum Percentage**") of the number of shares of Common Stock outstanding immediately after giving effect to such exercise. For purposes of the foregoing sentence, the aggregate number of shares of Common Stock beneficially owned by the Holder and the other Attribution Parties shall include the number of shares of Common Stock held by the Holder and all other Attribution Parties plus the number of shares of Common Stock issuable upon exercise of this Warrant with respect to which the determination of such sentence is being made, but shall exclude the number of shares of Common Stock which would be issuable upon (A) exercise of the remaining, unexercised portion of this Warrant beneficially owned by the Holder or any of the other Attribution Parties and (B) exercise or conversion of the unexercised or unconverted portion of any other securities of the Company (including, without limitation, any convertible notes or convertible preferred stock or warrants) beneficially owned by the Holder or any other Attribution Party subject to a limitation on conversion or exercise analogous to the limitation contained in this Section 1(f). For purposes of this Section 1(f), beneficial ownership shall be calculated in accordance with Section 13(d) of the Securities Exchange Act of 1934, as amended (the "**1934 Act**"). For purposes of this Warrant, in determining the number of outstanding shares of Common Stock the Holder may acquire upon the exercise of this Warrant without exceeding the Maximum Percentage, the Holder may rely on the number of outstanding shares of Common Stock as reflected in (x) the Company's most recent Annual Report on Form 10-K, Quarterly Report on Form 10-Q, Current Report on Form 8-K or other public filing with the Securities and Exchange Commission (the "**SEC**"), as the case may be, (y) a more recent public announcement by the Company or (3) any other written notice by the Company or the Transfer Agent setting forth the number of shares of Common Stock outstanding (the "**Reported Outstanding Share Number**"). If the Company receives an Exercise Notice from the Holder at a time when the actual number of outstanding shares of Common Stock is less than the Reported Outstanding Share Number, the Company shall (i) notify the Holder in writing of the number of shares of Common Stock then outstanding and, to the extent that such Exercise Notice would otherwise cause the Holder's beneficial ownership, as determined pursuant to this Section 1(f), to exceed the Maximum Percentage, the Holder must notify the Company of a reduced number of Warrant Shares to be purchased pursuant to such Exercise Notice (the number of shares by which such purchase is reduced, the "**Reduction Shares**") and (ii) as soon as reasonably practicable, the Company shall return to the Holder any exercise price paid by the Holder for the Reduction Shares. For any reason at any time, upon the written or oral request of the Holder, the Company shall within one (1) Business Day confirm orally and in writing or by electronic mail to the Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to the conversion or exercise of securities of the Company, including this Warrant, by the Holder and any other Attribution Party since the date as of which the Reported Outstanding Share Number was reported. In the event that the issuance of shares of Common Stock to the Holder upon exercise of this Warrant results in the Holder and the other Attribution Parties being deemed to beneficially own, in the aggregate, more than the Maximum Percentage of the number of outstanding shares of Common Stock (as determined under Section 13(d) of the 1934 Act), the number of shares so issued by which the Holder's and the other Attribution Parties' aggregate beneficial ownership exceeds the Maximum Percentage (the "**Excess Shares**") shall be deemed null and void and shall be cancelled ab initio, and the Holder shall not have the power to vote or to transfer the Excess Shares. As soon as reasonably practicable after the issuance of the Excess Shares has been deemed null and void, the Company shall return to the Holder the exercise price paid by the Holder for the Excess Shares. Upon delivery of a written notice to the Company, the Holder may from time to time increase (with such increase not effective until the sixty-first (61st) day after delivery of such notice) or decrease the Maximum Percentage to any other percentage not in excess of 9.99% as specified in such notice; provided that any such increase in the Maximum Percentage will not be effective until the sixty-first (61st) day after such notice is delivered to the Company. For purposes of clarity, the shares of Common Stock issuable pursuant to the terms of this Warrant in excess of the Maximum Percentage shall not be deemed to be beneficially owned by the Holder for any purpose including for purposes of Section 13(d) or Rule 16a-1(a)(1) of the 1934 Act. The provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 1(f) to the extent necessary to correct this paragraph or any portion of this paragraph which may be defective or inconsistent with the intended beneficial ownership limitation contained in this Section 1(f) or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitation contained in this paragraph may not be waived and shall apply to a successor holder of this Warrant.

(g) Insufficient Authorized Shares. If at any time while this Warrant remains outstanding the Company does not have a sufficient number of authorized and unreserved shares of Common Stock to satisfy its obligation to reserve for issuance upon exercise of this Warrant at least a number of shares of Common Stock necessary to effect the exercise of all of this Warrant then outstanding (the "**Required Reserve Amount**" and the failure to have such sufficient number of authorized and unreserved shares of Common Stock, an "**Authorized Share Failure**"), then the Company shall promptly take all action reasonably necessary to increase the Company's authorized shares of Common Stock to an amount sufficient to allow the Company to reserve the Required Reserve Amount for this Warrant. Without limiting the generality of the foregoing sentence, as soon as practicable after the date of the occurrence of an Authorized Share Failure, but in no event later than seventy-five (75) days after the occurrence of such Authorized Share Failure, the Company shall either (x) obtain the written consent of its shareholders for the approval of an increase in the number of authorized shares of Common Stock and provide each shareholder with an information statement with respect thereto or (y) hold a meeting of its shareholders for the approval of an increase in the number of authorized shares of Common Stock. In connection with such meeting, the Company shall provide each shareholder with a proxy statement and shall use its reasonable best efforts to solicit its shareholders' approval of such increase in authorized shares of Common Stock and to cause its board of directors to recommend to the shareholders that they approve such proposal. Notwithstanding the foregoing, if any such time of an Authorized Share Failure, the Company is able to obtain the written consent of a majority of the shares of its issued and outstanding Common Stock to approve the increase in the number of authorized shares of Common Stock, the Company may satisfy this obligation by obtaining such consent and submitting for filing with the SEC an Information Statement on Schedule 14C.

2 . ADJUSTMENT OF EXERCISE PRICE AND NUMBER OF WARRANT SHARES. The Exercise Price and the number of Warrant Shares shall be adjusted from time to time as follows:

(a) Voluntary Adjustment By Company. The Company may at any time during the term of this Warrant, with the prior written consent of the Holder, reduce the then current Exercise Price to any amount and for any period of time deemed appropriate by the Board of Directors of the Company.

(b) Adjustment Upon Subdivision or Combination of Shares of Common Stock. If the Company at any time on or after the Issuance Date subdivides (by any stock split, stock dividend, recapitalization or otherwise) one or more classes of its outstanding shares of Common Stock into a greater number of shares, the Exercise Price in effect immediately prior to such subdivision will be proportionately reduced and the number of Warrant Shares will be proportionately increased. If the Company at any time on or after the Issuance Date combines (by combination, reverse stock split or otherwise) one or more classes of its outstanding shares of Common Stock into a smaller number of shares, the Exercise Price in effect immediately prior to such combination will be proportionately increased and the number of Warrant Shares will be proportionately decreased. Any adjustment under this Section 2(b) shall become effective at the close of business on the date the subdivision or combination becomes effective.

(c) [RESERVED]

(d) Other Events. If any event occurs of the type contemplated by the provisions of this Section 2 but not expressly provided for by such provisions (including, without limitation, the granting of stock appreciation rights, phantom stock rights or other rights with equity features), then the Company's Board of Directors will make an appropriate adjustment in the Exercise Price and the number of Warrant Shares, as mutually determined by the Company's Board of Directors and the Holder, so as to protect the rights of the Holder; provided that no such adjustment pursuant to this Section 2(d) will increase the Exercise Price or decrease the number of Warrant Shares as otherwise determined pursuant to this Section 2.

(e) Maximum Eligibility Number. For the avoidance of doubt, all of the Warrant Share Number, whether or not the Warrant is exercisable in full at the time of such adjustment by virtue of the Maximum Eligibility Number limitation or otherwise, shall be exercisable at the Exercise Price in effect at the time of exercise as adjusted on or prior to such date pursuant to this Section 2.

(f) Exercise Floor Price. Unless and until such time as the Company obtains Shareholder Approval (as defined in the Securities Purchase Agreement) as required by the rules and regulations of the Principal Market, no adjustment pursuant to Section 2 shall cause the Exercise Price to be less than \$0.71, as adjusted for any stock dividend, stock split, stock combination, reclassification or similar transaction (the "**Exercise Floor Price**"). For the avoidance of doubt, if an adjustment to the Exercise Price pursuant to this Section 2 would cause the Exercise Price to be lower than the Exercise Floor Price but for the immediately preceding sentence, then the Exercise Price shall be equal to the Exercise Floor Price. Upon the receipt of such Shareholder Approval, any adjustment to the Exercise Price that would have been made pursuant to this Section 2, but for this Section 2(f), shall be made on the date of such receipt.

3 . RIGHTS UPON DISTRIBUTION OF ASSETS. If the Company shall declare or make any dividend or other distribution of its assets (or rights to acquire its assets) to holders of shares of Common Stock, by way of return of capital or otherwise (including, without limitation, any distribution of cash, stock or other securities, property, options, evidence of indebtedness or any other assets by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (a "**Distribution**"), at any time after the issuance of this Warrant, then, in each such case, the Holder shall be entitled to participate in such Distribution to the same extent that the Holder would have participated therein if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations or restrictions on exercise of this Warrant, including without limitation, the Maximum Percentage) immediately before the date of which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the participation in such Distribution (provided, however, that to the extent that the Holder's right to participate in any such Distribution would result in the Holder and the other Attribution Parties exceeding the Maximum Percentage, then the Holder shall not be entitled to participate in such Distribution to such extent (and shall not be entitled to beneficial ownership of such shares of Common Stock as a result of such Distribution (and beneficial ownership) to such extent) and the portion of such Distribution shall be held in abeyance for the benefit of the Holder until such time or times as its right thereto would not result in the Holder and the other Attribution Parties exceeding the Maximum Percentage, at which time or times the Holder shall be granted such Distribution (and any Distributions declared or made on such initial Distribution or on any subsequent Distribution held similarly in abeyance) to the same extent as if there had been no such limitation).

4. PURCHASE RIGHTS; FUNDAMENTAL TRANSACTIONS.

(a) Purchase Rights. In addition to any adjustments pursuant to Section 2 above, if at any time the Company grants, issues or sells any Options, Convertible Securities or rights to purchase stock, warrants, securities or other property pro rata to the record holders of any class of Common Stock (the "**Purchase Rights**"), then the Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the Holder could have acquired if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations or restrictions on exercise of this Warrant, including without limitation, the Maximum Percentage) immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the grant, issue or sale of such Purchase Rights (provided, however, that to the extent that the Holder's right to participate in any such Purchase Right would result in the Holder and the other Attribution Parties exceeding the Maximum Percentage, then the Holder shall not be entitled to participate in such Purchase Right to such extent (and shall not be entitled to beneficial ownership of such shares of Common Stock as a result of such Purchase Right (and beneficial ownership) to such extent) and such Purchase Right to such extent shall be held in abeyance for the benefit of the Holder until such time or times as its right thereto would not result in the Holder and the other Attribution Parties exceeding the Maximum Percentage, at which time or times the Holder shall be granted such right (and any Purchase Right granted, issued or sold on such initial Purchase Right or on any subsequent Purchase Right held similarly in abeyance) to the same extent as if there had been no such limitation).

(b) Fundamental Transactions. The Company shall not enter into or be party to a Fundamental Transaction unless the Successor Entity assumes in writing all of the obligations of the Company under this Warrant in accordance with the provisions of this Section 4(b) pursuant to written agreements in form and substance reasonably satisfactory to the Required Holders and approved by the Required Holders, such approval not to be unreasonably withheld or delayed, prior to such Fundamental Transaction, including agreements, if so requested by the Holder, to deliver to the Holder in exchange for the Warrant a security of the Successor Entity evidenced by a written instrument substantially similar in form and substance to this Warrant, including, without limitation, an adjusted exercise price equal to the value for the shares of Common Stock reflected by the terms of such Fundamental Transaction, and exercisable for a corresponding number of shares of capital stock equivalent to the shares of Common Stock acquirable and receivable upon exercise of this Warrant (without regard to any limitations on the exercise of this Warrant) prior to such Fundamental Transaction, and satisfactory to the Required Holders, and with an exercise price which applies the exercise price hereunder to such shares of capital stock (but taking into account the relative value of the shares of Common Stock pursuant to such Fundamental Transaction and the value of such shares of capital stock, such adjustments to the number of shares of capital stock and such exercise price being for the purpose of protecting the economic value of this Warrant immediately prior to the occurrence or consummation of such Fundamental Transaction). Upon the occurrence or consummation of any Fundamental Transaction, and it shall be a required condition to the occurrence or consummation of any Fundamental Transaction that, the Company and the Successor Entity or Successor Entities, jointly and severally, shall succeed to, and the Company shall cause any Successor Entity or Successor Entities to jointly and severally succeed to, and be added to the term "Company" under this Warrant (so that from and after the date of such Fundamental Transaction, and the provisions of this Warrant referring to the "Company" shall refer instead to each of the Company and the Successor Entity or Successor Entities, jointly and severally), and the Company and the Successor Entity or Successor Entities, jointly and severally, may exercise every right and power of the Company prior thereto and shall assume all of the obligations of the Company prior thereto under this Warrant with the same effect as if the Company and such Successor Entity or Successor Entities, jointly and severally, had been named as the Company in this Warrant, and, solely at the request of the Holder, if the Successor Entity and/or Successor Entities is a publicly traded corporation whose common stock is quoted on or listed for trading on an Eligible Market, shall deliver (in addition to and without limiting any right under this Warrant) to the Holder in exchange for this Warrant a security of the Successor Entity and/or Successor Entities evidenced by a written instrument substantially similar in form and substance to this Warrant and exercisable for a corresponding number of shares of capital stock of the Successor Entity and/or Successor Entities (the "**Successor Capital Stock**") equivalent to the shares of Common Stock acquirable and receivable upon exercise of this Warrant (without regard to any limitations on the exercise of this Warrant) prior to such Fundamental Transaction (such corresponding number of shares of Successor Capital Stock to be delivered to the Holder shall be equal to the greater of (A) the quotient of (i) the aggregate dollar value of all consideration (including cash consideration and any consideration other than cash ("**Non-Cash Consideration**"), in such Fundamental Transaction, as such values are set forth in any definitive agreement for the Fundamental Transaction that has been executed at the time of the first public announcement of the Fundamental Transaction or, if no such value is determinable from such definitive agreement, as determined in accordance with Section 12 with the term "Non-Cash Consideration" being substituted for the term "Exercise Price") that the Holder would have been entitled to receive upon the happening of such Fundamental Transaction or the record, eligibility or other determination date for the event resulting in such Fundamental Transaction, had this Warrant been exercised immediately prior to such Fundamental Transaction or the record, eligibility or other determination date for the event resulting in such Fundamental Transaction (without regard to any limitations on the exercise of this Warrant) (the "**Aggregate Consideration**") divided by (ii) the per share Closing Sale Price of such Successor Capital Stock on the Trading Day immediately prior to the consummation or occurrence of the Fundamental Transaction and (B) the product of (i) the Aggregate Consideration and (ii) the highest exchange ratio pursuant to which any shareholder of the Company may exchange Common Stock for Successor Capital Stock) (provided, however, to the extent that the Holder's right to receive any such shares of publicly traded common stock (or their equivalent) of the Successor Entity would result in the Holder and its other Attribution Parties exceeding the Maximum Percentage, if applicable, then the Holder shall not be entitled to receive such shares to such extent (and shall not be entitled to beneficial ownership of such shares of publicly traded common stock (or their equivalent) of the Successor Entity as a result of such consideration to such extent) and the portion of such shares shall be held in abeyance for the Holder until such time or times, as its right thereto would not result in the Holder and its other Attribution Parties exceeding the Maximum Percentage, at which time or times the Holder shall be delivered such shares to the extent as if there had been no such limitation), and such security shall be reasonably satisfactory to the Holder, and with an identical exercise price to the Exercise Price hereunder (such adjustments to the number of shares of capital stock and such exercise price being for the purpose of protecting after the consummation or occurrence of such Fundamental Transaction the economic value of this Warrant that was in effect immediately prior to the consummation or occurrence of such Fundamental Transaction, as elected by the Holder solely at its option). Upon occurrence or consummation of the Fundamental Transaction, and it shall be a required condition to the occurrence or consummation of such Fundamental Transaction that, the Company and the Successor Entity or Successor Entities shall deliver to the Holder confirmation that there shall be issued upon exercise of this Warrant at any time after the occurrence or consummation of the Fundamental Transaction, as elected by the Holder solely at its option, shares of Common Stock, Successor Capital Stock or, in lieu of the shares of Common Stock or Successor Capital Stock (or other securities, cash, assets or other property purchasable upon the exercise of this Warrant prior to such Fundamental Transaction), such shares of stock, securities, cash, assets or any other property whatsoever (including warrants or other purchase or subscription rights), which for purposes of clarification may continue to be shares of Common Stock, if any, that the Holder would have been entitled to receive upon the happening of such Fundamental Transaction or the record, eligibility or other determination date for the event resulting in such Fundamental Transaction, had this Warrant been exercised immediately prior to such Fundamental Transaction or the record, eligibility or other determination date for the event resulting in such Fundamental Transaction (without regard to any limitations on the exercise of this Warrant), as adjusted in accordance with the provisions of this Warrant. In addition to and not in substitution for any other rights hereunder, prior to the occurrence or consummation of any Fundamental Transaction pursuant to which holders of shares of Common Stock are entitled to receive securities, cash, assets or other property with respect to or in exchange for shares of Common Stock (a "**Corporate Event**"), the Company shall make appropriate provision to ensure that, and any applicable Successor Entity or Successor Entities shall ensure that, and it shall be a required condition to the occurrence or consummation of such Corporate Event that, the Holder will thereafter have the right to receive upon exercise of this Warrant at any time after the occurrence or consummation of the Corporate Event, shares of Common Stock or Successor Capital Stock or, if so elected by the Holder, in lieu of the shares of Common Stock (or other securities, cash, assets or other property) purchasable upon the exercise of this Warrant prior to such Corporate Event (but not in lieu of such items still issuable under Sections 3 and 4(a), which shall continue to be receivable on the Common Stock or on the such shares of stock, securities, cash, assets or any other property otherwise receivable with respect to or in exchange for shares of Common Stock), such shares of stock, securities, cash, assets or any other property whatsoever (including warrants or other purchase or subscription rights and any shares of Common Stock) which the Holder would have been entitled to receive upon the occurrence or consummation of such Corporate Event or the record, eligibility or other determination date for the event resulting in such Corporate Event, had this Warrant been exercised immediately prior to such Corporate Event or the record, eligibility or other determination date for the event resulting in such Corporate Event (without regard to any limitations on exercise of this Warrant). Provision made pursuant to the preceding sentence shall be in a form and substance reasonably satisfactory to the Holder. The provisions of this Section 4(b) shall apply similarly and equally to successive Fundamental Transactions and Corporate Events. Notwithstanding the foregoing, the Holder may elect, in its sole discretion, by delivery of written notice to the Company, to waive this Section 4(b) and allow the Company to enter into or be a party to a Fundamental Transaction without the assumption of this Warrant pursuant to the provisions of this Section 4(b).

(c) Notwithstanding anything herein to the contrary, the Company shall be required to obtain the prior written consent of the Required Holders to enter into, allow and/or consummate a Fundamental Transaction other than one in which a Successor Entity that is a publicly traded corporation whose stock is quoted or listed for trading on an Eligible Market assumes this Warrant such that the Warrant shall be exercisable for the publicly traded Common Stock of such Successor Entity.

5 . NONCIRCUMVENTION. The Company hereby covenants and agrees that the Company will not, by amendment of its Articles of Incorporation or Bylaws, or through any reorganization, transfer of assets, consolidation, merger, scheme of arrangement, dissolution, issue or sale of securities, or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms of this Warrant, and will at all times in good faith carry out all of the provisions of this Warrant and take all action as may be required to protect the rights of the Holder. Without limiting the generality of the foregoing, the Company (i) shall not increase the par value of any shares of Common Stock receivable upon the exercise of this Warrant above the Exercise Price then in effect, (ii) shall take all such actions as may be necessary or appropriate in order that the Company may validly and legally issue fully paid and nonassessable shares of Common Stock upon the exercise of this Warrant, and (iii) shall, so long as this Warrant is outstanding, take all action necessary to reserve and keep available out of its authorized and unissued shares of Common Stock, solely for the purpose of effecting the exercise of this Warrant, the Required Reserve Amount to effect the exercise of this Warrant then outstanding (without regard to any limitations on exercise).

6 . WARRANT HOLDER NOT DEEMED A SHAREHOLDER. Except as otherwise specifically provided herein, the Holder, solely in such Person's capacity as a holder of this Warrant, shall not be entitled to vote or receive dividends or be deemed the holder of share capital of the Company for any purpose, nor shall anything contained in this Warrant be construed to confer upon the Holder, solely in such Person's capacity as the Holder of this Warrant, any of the rights of a shareholder of the Company or any right to vote, give or withhold consent to any corporate action (whether any reorganization, issue of stock, reclassification of stock, consolidation, merger, conveyance or otherwise), receive notice of meetings, receive dividends or subscription rights, or otherwise, prior to the issuance to the Holder of the Warrant Shares which such Person is then entitled to receive upon the due exercise of this Warrant. In addition, nothing contained in this Warrant shall be construed as imposing any liabilities on the Holder to purchase any securities (upon exercise of this Warrant or otherwise) or as a shareholder of the Company, whether such liabilities are asserted by the Company or by creditors of the Company. Notwithstanding this Section 6, the Company shall provide the Holder with copies of the same notices and other information given to the shareholders of the Company generally, contemporaneously with the giving thereof to the shareholders.

7. REISSUANCE OF WARRANTS.

(a) Transfer of Warrant. If this Warrant is to be transferred, the Holder shall surrender this Warrant to the Company, whereupon the Company will forthwith issue and deliver upon the order of the Holder a new Warrant (in accordance with Section 7(d)), registered as the Holder may request, representing the right to purchase the number of Warrant Shares being transferred by the Holder and, if less than the total number of Warrant Shares then underlying this Warrant is being transferred, a new Warrant (in accordance with Section 7(d)) to the Holder representing the right to purchase the number of Warrant Shares not being transferred.

(b) Lost, Stolen or Mutilated Warrant. Upon receipt by the Company of evidence reasonably satisfactory to the Company of the loss, theft, destruction or mutilation of this Warrant, and, in the case of loss, theft or destruction, of any indemnification undertaking by the Holder to the Company in customary form and, in the case of mutilation, upon surrender and cancellation of this Warrant, the Company shall execute and deliver to the Holder a new Warrant (in accordance with Section 7(d)) representing the right to purchase the Warrant Shares then underlying this Warrant.

(c) Exchangeable for Multiple Warrants. This Warrant is exchangeable, upon the surrender hereof by the Holder at the principal office of the Company, for a new warrant or warrants (in accordance with Section 7(d)) representing in the aggregate the right to purchase the number of Warrant Shares then underlying this Warrant, and each such new Warrant will represent the right to purchase such portion of such Warrant Shares as is designated by the Holder at the time of such surrender; provided, however, that no Warrants for fractional Warrant Shares shall be given.

(d) Issuance of New Warrants. Whenever the Company is required to issue a new Warrant pursuant to the terms of this Warrant, such new Warrant (i) shall be of like tenor with this Warrant, (ii) shall represent, as indicated on the face of such new Warrant, the right to purchase the Warrant Shares then underlying this Warrant (or in the case of a new Warrant being issued pursuant to Section 7(a) or Section 7(c), the Warrant Shares designated by the Holder which, when added to the number of shares of Common Stock underlying the other new warrants issued in connection with such issuance, does not exceed the number of Warrant Shares then underlying this Warrant), (iii) shall have an issuance date, as indicated on the face of such new Warrant which is the same as the Issuance Date, and (iv) shall have the same rights and conditions as this Warrant.

8 . NOTICES. Any notices, consents, waivers or other communications required or permitted to be given under the terms of this Agreement must be in writing and will be deemed to have been delivered: (i) upon receipt, when delivered personally; (ii) upon receipt, when sent by electronic mail; or (iii) one Business Day after deposit with an overnight courier service, in each case properly addressed to the party to receive the same. The addresses, and e-mail addresses for such communications shall be:

If to the Company:

Real Goods Solar, Inc.
833 West South Boulder Road,
Louisville, CO 80027
Telephone: (303) 222-8541
E-mail: Paul.Anderson@rgsenergy.com
Attention: Paul Anderson, Chief Administrative Officer, General Counsel and Secretary

With a copy (for informational purposes only) to:

Brownstein Hyatt Farber Schreck, LLP
410 Seventeenth Street, Suite 2200
Denver, CO 80202
Telephone: (303) 223-1100
E-mail: RLundberg@BHFS.com
Attention: Rikard Lundberg

If to Holder:

Roth Capital Partners, LLC
888 San Clemente Drive
Newport Beach, CA 92660
Telephone: (949) 720-5750
E-mail: RStephenson@roth.com
Attention: Robert Stephenson

With a copy (for informational purposes only) to:

Pryor Cashman LLP
7 Times Square
New York, NY 10036
Telephone: (212) 326-0820
E-mail: ali.panjwani@pryorcashman.com
Attention: M. Ali Panjwani, Esq.

The Company shall provide the Holder with prompt written notice of all actions taken pursuant to this Warrant, including in reasonable detail a description of such action and the reason therefor. Without limiting the generality of the foregoing, the Company will give written notice to the Holder (i) immediately upon any adjustment of the Exercise Price, setting forth in reasonable detail, and certifying, the calculation of such adjustment, or (ii) at least fifteen (15) days prior to the date on which the Company closes its books or takes a record (A) with respect to any dividend or distribution upon the shares of Common Stock, (B) with respect to any grants, issuances or sales of any Options, Convertible Securities or rights to purchase stock, warrants, securities or other property to holders of shares of Common Stock or (C) for determining rights to vote with respect to any Fundamental Transaction, dissolution or liquidation; provided in each case that such information shall be made known to the public prior to or in conjunction with such notice being provided to the Holder. It is expressly understood and agreed that the time of exercise specified by the Holder in each Exercise Notice shall be definitive and may not be disputed or challenged by the Company.

9 . AMENDMENT AND WAIVER. Except as otherwise provided herein, the provisions of this Warrant may be amended or waived and the Company may take any action herein prohibited, or omit to perform any act herein required to be performed by it, only if the Company has obtained the written consent of the Holder.

10. GOVERNING LAW; JURISDICTION; JURY TRIAL. This Warrant shall be governed by and construed and enforced in accordance with, and all questions concerning the construction, validity, interpretation and performance of this Warrant shall be governed by, the internal laws of the State of New York, without giving effect to any choice of law or conflict of law provision or rule (whether of the State of New York or any other jurisdictions) that would cause the application of the laws of any jurisdictions other than the State of New York. The Company hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in The City of New York, Borough of Manhattan, for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is brought in an inconvenient forum or that the venue of such suit, action or proceeding is improper. The Company hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof to the Company at the address set forth in Section 8 and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any manner permitted by law. Nothing contained herein shall be deemed or operate to preclude the Holder from bringing suit or taking other legal action against the Company in any other jurisdiction to collect on the Company's obligations to the Holder, to realize on any collateral or any other security for such obligations, or to enforce a judgment or other court ruling in favor of the Holder. **THE COMPANY HEREBY IRREVOCABLY WAIVES ANY RIGHT IT MAY HAVE, AND AGREES NOT TO REQUEST, A JURY TRIAL FOR THE ADJUDICATION OF ANY DISPUTE HEREUNDER OR IN CONNECTION WITH OR ARISING OUT OF THIS WARRANT OR ANY TRANSACTION CONTEMPLATED HEREBY.**

11. CONSTRUCTION; HEADINGS. This Warrant shall be deemed to be jointly drafted by the Company and the Holder and shall not be construed against any Person as the drafter hereof. The headings of this Warrant are for convenience of reference and shall not form part of, or affect the interpretation of, this Warrant.

12. DISPUTE RESOLUTION. In the case of a dispute as to the determination of the Exercise Price or the arithmetic calculation of the Warrant Shares, the Company shall submit the disputed determinations or arithmetic calculations via facsimile or electronic mail within two (2) Business Days after receipt of the Exercise Notice giving rise to such dispute, as the case may be, to the Holder. If the Holder and the Company are unable to agree upon such determination or calculation of the Exercise Price or the Warrant Shares within three (3) Business Days after such disputed determination or arithmetic calculation being submitted to the Holder, then the Company shall, within two (2) Business Days submit via facsimile (a) the disputed determination of the Exercise Price to an independent, reputable investment bank selected by the Holder and approved by the Company, such approval not to be unreasonably withheld or delayed or (b) the disputed arithmetic calculation of the Warrant Shares to an independent, outside accountant, selected by the Holder and approved by the Company, such approval not to be unreasonably withheld or delayed. The Company shall cause at its expense the investment bank or the accountant, as the case may be, to perform the determinations or calculations and notify the Company and the Holder of the results no later than ten (10) Business Days from the time it receives the disputed determinations or calculations. Such investment bank's or accountant's determination or calculation, as the case may be, shall be binding upon all parties absent demonstrable error.

13. REMEDIES, OTHER OBLIGATIONS, BREACHES AND INJUNCTIVE RELIEF. The remedies provided in this Warrant shall be cumulative and in addition to all other remedies available under this Warrant, at law or in equity (including a decree of specific performance and/or other injunctive relief), and nothing herein shall limit the right of the Holder to pursue actual damages for any failure by the Company to comply with the terms of this Warrant. The Company acknowledges that a breach by it of its obligations hereunder will cause irreparable harm to the Holder and that the remedy at law for any such breach may be inadequate. The Company therefore agrees that, in the event of any such breach or threatened breach, the holder of this Warrant shall be entitled, in addition to all other available remedies, to an injunction restraining any breach, without the necessity of showing economic loss and without any bond or other security being required.

14. TRANSFER; LEGENDS.

(a) Transfer. This Warrant and the Warrant Shares may be offered for sale, sold, transferred, pledged or assigned without the consent of the Company. The Holder understands that: (i) this Warrant and the Warrant Shares have not been registered under the 1933 Act or any state securities laws, and may not be offered for sale, sold, assigned or transferred unless (A) subsequently registered thereunder, (B) the Holder shall have delivered to the Company an opinion of counsel selected by the Holder, in a generally acceptable form, to the effect that this Warrant and the Warrant Shares to be sold, assigned or transferred may be sold, assigned or transferred pursuant to an exemption from such registration, or (C) the Holder provides the Company with reasonable assurance that this Warrant and the Warrant Shares, as applicable, can be sold, assigned or transferred pursuant to Rule 144 ("Rule 144") or Rule 144A ("Rule 144A") promulgated under the 1933 Act, as amended, (or a successor rule thereto); (ii) any sale of this Warrant or any Warrant Shares made in reliance on Rule 144 or Rule 144A may be made only in accordance with the terms of Rule 144 or Rule 144A, as applicable, and further, if Rule 144 or Rule 144A is not available, any resale of this Warrant or any Warrant Shares under circumstances in which the seller (or the Person) through whom the sale is made) may be deemed to be an underwriter (as that term is defined in the 1933 Act) may require compliance with some other exemption under the 1933 Act or the rules and regulations of the SEC thereunder; and (iii) neither the Company nor any other Person is under any obligation to register the Securities under the 1933 Act or any state securities laws or to comply with the terms and conditions of any exemption thereunder. Notwithstanding the foregoing, this Warrant and the Warrant Shares may be pledged in connection with a bona fide margin account or other loan or financing arrangement secured by this Warrant and the Warrant Shares, as applicable, and such pledge of this Warrant and the Warrant Shares shall not be deemed to be a transfer, sale or assignment of this Warrant and the Warrant Shares hereunder, and the Holder effecting a pledge of this Warrant and the Warrant Shares shall not be required to provide the Company with any notice thereof or otherwise make any delivery to the Company.

(b) Legends. Except for Warrant Shares sold pursuant to an effective registration statement or pursuant to Rule 144, the stock certificates representing the Warrant Shares shall bear a restrictive legend in substantially the following form (and a stop-transfer order may be placed against transfer of such stock certificates):

THE SECURITIES REPRESENTED BY THIS CERTIFICATE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED, OR APPLICABLE STATE SECURITIES LAWS. THE SECURITIES MAY NOT BE OFFERED FOR SALE, SOLD, TRANSFERRED OR ASSIGNED (I) IN THE ABSENCE OF (A) AN EFFECTIVE REGISTRATION STATEMENT FOR THE SECURITIES UNDER THE SECURITIES ACT OF 1933, AS AMENDED, OR (B) AN OPINION OF COUNSEL SELECTED BY THE HOLDER, IN A GENERALLY ACCEPTABLE FORM, THAT REGISTRATION IS NOT REQUIRED UNDER SAID ACT OR (II) UNLESS SOLD PURSUANT TO RULE 144 OR RULE 144A UNDER SAID ACT. NOTWITHSTANDING THE FOREGOING, THE SECURITIES MAY BE PLEDGED IN CONNECTION WITH A BONA FIDE MARGIN ACCOUNT OR OTHER LOAN OR FINANCING ARRANGEMENT SECURED BY THE SECURITIES.

15. SEVERABILITY. If any provision of this Warrant is prohibited by law or otherwise determined to be invalid or unenforceable by a court of competent jurisdiction, the provision that would otherwise be prohibited, invalid or unenforceable shall be deemed amended to apply to the broadest extent that it would be valid and enforceable, and the invalidity or unenforceability of such provision shall not affect the validity of the remaining provisions of this Warrant so long as this Warrant as so modified continues to express, without material change, the original intentions of the parties as to the subject matter hereof and the prohibited nature, invalidity or unenforceability of the provision(s) in question does not substantially impair the respective expectations or reciprocal obligations of the parties or the practical realization of the benefits that would otherwise be conferred upon the parties. The parties will endeavor in good faith negotiations to replace the prohibited, invalid or unenforceable provision(s) with a valid provision(s), the effect of which comes as close as possible to that of the prohibited, invalid or unenforceable provision(s).

16. DISCLOSURE. Upon receipt or delivery by the Company of any notice in accordance with the terms of this Warrant, unless the Company has in good faith determined that the matters relating to such notice do not constitute material, nonpublic information relating to the Company or its Subsidiaries (as defined in the Securities Purchase Agreement), the Company shall within one (1) Business Day after any such receipt or delivery publicly disclose such material, nonpublic information on a Current Report on Form 8-K or otherwise. In the event that the Company believes that a notice contains material, nonpublic information relating to the Company or its Subsidiaries, the Company so shall indicate to such Holder contemporaneously with delivery of such notice, and in the absence of any such indication, the Holder shall be allowed to presume that all matters relating to such notice do not constitute material, nonpublic information relating to the Company or its Subsidiaries.

17. CERTAIN DEFINITIONS. For purposes of this Warrant, the following terms shall have the following meanings:

(a) **"1933 Act"** means the Securities Act of 1933, as amended.

(b) **"Affiliate"** means, with respect to any Person, any other Person that directly or indirectly controls, is controlled by, or is under common control with, such Person, it being understood for purposes of this definition that "control" of a Person means the power directly or indirectly either to vote 10% or more of the stock having ordinary voting power for the election of directors of such Person or direct or cause the direction of the management and policies of such Person whether by contract or otherwise.

(c) **"Attribution Parties"** means, collectively, the following Persons and entities: (i) any investment vehicle, including, any funds, feeder funds or managed accounts, currently, or from time to time after the Issuance Date, directly or indirectly managed or advised by the Holder's investment manager or any of its Affiliates or principals, (ii) any direct or indirect Affiliates of the Holder or any of the foregoing, (iii) any Person acting or who could be deemed to be acting as a Group together with the Holder or any of the foregoing and (iv) any other Persons whose beneficial ownership of the Company's Common Stock would or could be aggregated with the Holder's and the other Attribution Parties for purposes of Section 13(d) of the 1934 Act. For clarity, the purpose of the foregoing is to subject collectively the Holder and all other Attribution Parties to the Maximum Percentage.

(d) **"Bloomberg"** means Bloomberg Financial Markets.

(e) **"Business Day"** means any day other than Saturday, Sunday or other day on which commercial banks in The City of New York are authorized or required by law to remain closed.

(f) **"Closing Bid Price"** and **"Closing Sale Price"** means, for any security as of any date, the last closing bid price and last closing trade price, respectively, for such security on the Principal Market, as reported by Bloomberg, or, if the Principal Market begins to operate on an extended hours basis and does not designate the closing bid price or the closing trade price, as the case may be, then the last bid price or the last trade price, respectively, of such security prior to 4:00:00 p.m., New York time, as reported by Bloomberg, or, if the Principal Market is not the principal securities exchange or trading market for such security, the last closing bid price or last trade price, respectively, of such security on the principal securities exchange or trading market where such security is listed or traded as reported by Bloomberg, or if the foregoing do not apply, the last closing bid price or last trade price, respectively, of such security in the over-the-counter market on the electronic bulletin board for such security as reported by Bloomberg, or, if no closing bid price or last trade price, respectively, is reported for such security by Bloomberg, the average of the bid prices, or the ask prices, respectively, of any market makers for such security as reported in the OTC Link or "pink sheets" by OTC Markets Group Inc. (formerly Pink OTC Markets Inc.). If the Closing Bid Price or the Closing Sale Price cannot be calculated for a security on a particular date on any of the foregoing bases, the Closing Bid Price or the Closing Sale Price, as the case may be, of such security on such date shall be the fair market value as mutually determined by the Company and the Holder. If the Company and the Holder are unable to agree upon the fair market value of such security, then such dispute shall be resolved pursuant to Section 12. All such determinations to be appropriately adjusted for any stock dividend, stock split, stock combination, reclassification or other similar transaction during the applicable calculation period.

(g) **"Common Stock"** means (i) the Company's shares of Class A Common Stock, par value \$0.0001 per share, and (ii) any share capital into which such Common Stock shall have been changed or any share capital resulting from a reclassification of such Common Stock.

(h) **"Convertible Securities"** means any stock or securities (other than Options) directly or indirectly convertible into or exercisable or exchangeable for shares of Common Stock.

(i) **"Convertible Notes"** means the Company's Senior Secured Convertible Notes, issued April 1, 2016 to the investors listed on the Schedule of Buyers attached to the Securities Purchase Agreement.

(j) **"Eligible Market"** means the Principal Market, the NYSE MKT LLC, The NASDAQ Global Market, The NASDAQ Global Select Market, The New York Stock Exchange, Inc., the OTC Bulletin Board, the OTC QX or the OTC QB.

(k) **"Expiration Date"** means April 1, 2021.

(l) **"Fundamental Transaction"** means (A) that the Company shall, directly or indirectly, including through Subsidiaries, Affiliates or otherwise, in one or more related transactions, (i) consolidate or merge with or into (whether or not the Company is the surviving corporation) another Subject Entity, or (ii) sell, assign, transfer, convey or otherwise dispose of all or substantially all of the properties or assets of the Company or any of its "significant subsidiaries" (as defined in Rule 1-02 of Regulation S-X) to one or more Subject Entities, or (iii) make, or allow one or more Subject Entities to make, or allow the Company to be subject to or have its Common Stock be subject to or party to one or more Subject Entities making, a purchase, tender or exchange offer that is accepted by the holders of at least either (x) 50% of the outstanding shares of Common Stock, (y) 50% of the outstanding shares of Common Stock calculated as if any shares of Common Stock held by all Subject Entities making or party to, or Affiliated with any Subject Entities making or party to, such purchase, tender or exchange offer were not outstanding; or (z) such number of shares of Common Stock such that all Subject Entities making or party to, or Affiliated with any Subject Entity making or party to, such purchase, tender or exchange offer, become collectively the beneficial owners (as defined in Rule 13d-3 under the 1934 Act) of at least 50% of the outstanding shares of Common Stock, or (iv) consummate a share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off or scheme of arrangement) with one or more Subject Entities whereby such Subject Entities, individually or in the aggregate, acquire, either (x) at least 50% of the outstanding shares of Common Stock, (y) at least 50% of the outstanding shares of Common Stock calculated as if any shares of Common Stock held by all the Subject Entities making or party to, or Affiliated with any Subject Entity making or party to, such stock purchase agreement or other business combination were not outstanding; or (z) such number of shares of Common Stock such that the Subject Entities become collectively the beneficial owners (as defined in Rule 13d-3 under the 1934 Act) of at least 50% of the outstanding shares of Common Stock, or (v) reorganize, recapitalize or reclassify its Common Stock, (B) that the Company shall, directly or indirectly, including through Subsidiaries, Affiliates or otherwise, in one or more related transactions, allow any Subject Entity individually or the Subject Entities in the aggregate to be or become the "beneficial owner" (as defined in Rule 13d-3 under the 1934 Act), directly or indirectly, whether through acquisition, purchase, assignment, conveyance, tender, tender offer, exchange, reduction in outstanding shares of Common Stock, merger, consolidation, business combination, reorganization, recapitalization, spin-off, scheme of arrangement, reorganization, recapitalization or reclassification or otherwise in any manner whatsoever, of either (x) at least 50% of the aggregate ordinary voting power represented by issued and outstanding Common Stock, (y) at least 50% of the aggregate ordinary voting power represented by issued and outstanding Common Stock not held by all such Subject Entities as of the Issuance Date calculated as if any shares of Common Stock held by all such Subject Entities were not outstanding, or (z) a percentage of the aggregate ordinary voting power represented by issued and outstanding shares of Common Stock or other equity securities of the Company sufficient to allow such Subject Entities to effect a statutory short form merger or other transaction requiring other shareholders of the Company to surrender their shares of Common Stock without approval of the shareholders of the Company or (C) directly or indirectly, including through Subsidiaries, Affiliates or otherwise, in one or more related transactions, the issuance of or the entering into any other instrument or transaction structured in a manner to circumvent, or that circumvents, the intent of this definition in which case this definition shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this definition to the extent necessary to correct this definition or any portion of this definition which may be defective or inconsistent with the intended treatment of such instrument or transaction.

(m) **"Group"** means a "group" as that term is used in Section 13(d) of the 1934 Act and as defined in Rule 13d-5 thereunder.

(n) **"Master Restricted Account"** shall have the meaning attributed to such term in the Convertible Notes.

(o) **"Maximum Eligibility Increase Factor"** means a number of shares of Common Stock equal to the product of (i) the Warrant Share Number and (ii) the Percentage Interest.

(p) **"Maximum Eligibility Number"** means initially SIXTY THREE THOUSAND FOUR HUNDRED EIGHTY EIGHT (63,488) and such number shall be increased each time cash is released to the Company from one or more of the Master Restricted Accounts, by a number of shares of Common Stock equal to the Maximum Eligibility Increase Factor.

(q) **"Options"** means any rights, warrants or options to subscribe for or purchase shares of Common Stock or Convertible Securities.

(r) **"Parent Entity"** of a Person means an entity that, directly or indirectly, controls the applicable Person, including such entity whose common shares or common stock or equivalent equity security is quoted or listed on an Eligible Market (or, if so elected by the Holder, any other market, exchange or quotation system), or, if there is more than one such Person or such entity, the Person or such entity designated by the Holder or in the absence of such designation, such Person or entity with the largest public market capitalization as of the date of consummation of the Fundamental Transaction.

(s) **"Percentage Interest"** means a fraction, (i) the numerator of which is the aggregate cash amount being released by the Buyers (as defined in the Securities Purchase Agreement) to the Company from the Master Restricted Accounts, and (ii) the denominator of which is the aggregate Purchase Price (as defined in the Securities Purchase Agreement).

(t) **"Person"** means an individual, a limited liability company, a partnership, a joint venture, a corporation, a trust, an unincorporated organization, any other entity and a government or any department or agency thereof.

(u) **"Principal Market"** means The NASDAQ Capital Market.

(v) **"Registration Rights Agreement"** means that certain Registration Rights Agreement dated as of April 1, 2016 by and among the Company and the Buyers.

(w) **"Required Holders"** means the holders of the SPA Warrants representing at least fifty-five percent (55%) of the shares of Common Stock underlying the SPA Warrants then outstanding and shall include Hudson Bay Master Fund, Ltd. so long as Hudson Bay Master Fund, Ltd. and/or any of its Affiliates collectively hold at least five percent (5%) of the SPA Warrants.

(x) **"Rule 144"** means Rule 144 promulgated under the 1933 Act or any successor rule thereto.

(y) **"Securities Purchase Agreement"** means the Securities Purchase Agreement, dated as of April 1, 2016, by and among the Company and the investors named on the Schedule of Buyers attached thereto.

Agreement. (z) **"SPA Warrants "** means the Series G Warrants to purchase Common Stock issued pursuant to the Securities Purchase

(aa) **"Subject Entity"** means any Person, Persons or Group or any Affiliate or associate of any such Person, Persons or Group.

(bb) **"Successor Entity"** means one or more Person or Persons (or, if so elected by the Holder, the Company or Parent Entity) formed by, resulting from or surviving any Fundamental Transaction or one or more Person or Persons (or, if so elected by the Holder, the Company or the Parent Entity) with which such Fundamental Transaction shall have been entered into.

(cc) **"Trading Day"** means any day on which the Common Stock is traded on the Principal Market, or, if the Principal Market is not the principal trading market for the Common Stock, then on the principal securities exchange or securities market on which the Common Stock is then traded; provided that "Trading Day" shall not include any day on which the Common Stock is scheduled to trade on such exchange or market for less than 4.5 hours or any day that the Common Stock is suspended from trading during the final hour of trading on such exchange or market (or if such exchange or market does not designate in advance the closing time of trading on such exchange or market, then during the hour ending at 4:00:00 p.m., New York time).

[Signature Page Follows]

IN WITNESS WHEREOF, the Company has caused this Warrant to Purchase Common Stock to be duly executed as of the Issuance Date set out above.

REAL GOODS SOLAR, INC.

By: _____
Name: Dennis Lacey
Title: Chief Executive Officer

EXERCISE NOTICE

TO BE EXECUTED BY THE REGISTERED HOLDER TO EXERCISE THIS
WARRANT TO PURCHASE COMMON STOCK

REAL GOODS SOLAR, INC.

The undersigned holder hereby exercises the right to purchase _____ of the shares of Class A Common Stock, par value \$0.0001 per share (the "**Warrant Shares**"), of Real Goods Solar, Inc., a Colorado corporation (the "**Company**"), evidenced by the attached Warrant to purchase Common Stock No. WPA3-1 (the "**Warrant**"). Capitalized terms used herein and not otherwise defined shall have the respective meanings set forth in the Warrant.

1. Form of Exercise Price. The holder intends that payment of the Exercise Price shall be made as:

_____ a "Cash Exercise" with respect to _____ Warrant Shares; or

_____ a "Cashless Exercise" with respect to _____ Warrant Shares.

2. Payment of Exercise Price. In the event that the holder has elected a Cash Exercise with respect to some or all of the Warrant Shares to be issued pursuant hereto, the holder shall pay the Aggregate Exercise Price in the sum of \$ _____ to the Company in accordance with the terms of the Warrant.

3. Delivery of Warrant Shares. The Company shall deliver to the holder _____ Warrant Shares in accordance with the terms of the Warrant.

Check here if the shares of Common Stock to be issued in connection with this Exercise Notice are being sold contemporaneously herewith by the Holder.

Please issue the Warrant Shares in the following name and to the following account:

Issue to: _____

Facsimile Number and Electronic Mail: _____

Authorization: _____

By: _____

Title: _____

Dated: _____

Broker Name: _____

Broker DTC #: _____

Broker Telephone #: _____

Account Number: _____
(if electronic book entry transfer)

Transaction Code Number: _____
(if electronic book entry transfer)

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Real Goods Solar, Inc.
Denver, Colorado

We hereby consent to the use in the Prospectus constituting a part of this Registration Statement of our report dated April 15, 2019, relating to the consolidated financial statements of Real Goods Solar, Inc. (the "Company") as of and for the year ended December 31, 2018, which is contained in that Prospectus. Our report contains an explanatory paragraph regarding the Company's ability to continue as a going concern.

We also consent to the reference to us under the caption "Experts" in the Prospectus.

/s/ BDO USA, LLP

Dallas, Texas

April 15, 2019

Consent of Independent Registered Public Accounting Firm

We consent to the use in this Registration Statement on Form S-1 of Real Goods Solar, Inc. of our report dated April 2, 2018, except for the reclassification adjustments applied to the 2017 financial statements as described under the heading *Discontinued Operations* in Note 2 as to which the date is April 15, 2019, relating to the 2017 consolidated financial statements of Real Goods Solar, Inc. which report expresses an unqualified opinion and includes an explanatory paragraph regarding going concern uncertainty, and to the reference to our firm under the heading “Experts” in the Prospectus, which is part of this Registration Statement.

/s/ Moss Adams LLP

Denver, Colorado
April 15, 2019
