

Ascent Solar Technologies, Inc.
Form 424B5
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Registration No. 333-178821
PROSPECTUS SUPPLEMENT
(To the Prospectus Dated February 3, 2012)

Ascent Solar Technologies, Inc.

Up to \$10,000,000
of
Series B-1 Preferred Stock and Series B-2 Preferred Stock and Common Stock

We are offering up to an aggregate of \$10,000,000 of our newly designated Series B-1 preferred stock (“Series B-1 Shares”), Series B-2 preferred stock (“Series B-2 Shares”; together with the Series B-2 Shares, the “Series B Preferred Shares”), up to 8,695,653 shares of common stock issuable upon conversion of the Series B Preferred Shares, and additional shares of common stock that we may choose to issue in payment of dividends on the Series B Preferred Shares, to Ironridge Technology Co., a division of Ironridge Global IV, Ltd. (“Ironridge”), pursuant to this prospectus supplement and the accompanying prospectus.

We are offering the Series B Preferred Shares to Ironridge in two tranches. In the first tranche, we are offering 500 Series B-1 Shares to Ironridge at a purchase price for each Series B-1 Share of \$10,000 per share. We expect the first tranche to close shortly after the date of this prospectus supplement, resulting in gross proceeds to us of \$5,000,000. In the second tranche, we are offering either 500 Series B-1 Shares or 500 Series B-2 Shares (but not both) to Ironridge at a purchase price for each Series B-1 Share or B-2 Share of \$10,000 per share, which would result in additional gross proceeds to us of \$5,000,000. The Series B-1 Shares will be convertible into common stock at a fixed conversion price of \$1.15 per share of common stock. The Series B-2 Shares (if issued) will be convertible into common stock at a fixed conversion price of \$1.50 per share of common stock. For a more detailed description of the terms of the Series B-1 shares and the Series B-2 Shares, see the section entitled “Description of Series B Preferred Stock” beginning on page S-17 of this prospectus supplement.

The second tranche will not close until after our stockholders approve certain issuances of our shares related to this offering in accordance with Nasdaq Listing Rule 5635(d). That rule requires stockholders to approve certain stock issuances that may aggregate to 20% or more of our outstanding common stock. We intend to hold a special stockholder meeting as soon as practicable in order to obtain such approval. If our stockholders do not vote to approve such issuances of our shares in accordance with such rule, then the second tranche will not close and we would not receive the related proceeds.

The shares issued in the second tranche will be Series B-2 Shares if the closing price of our common stock on the Nasdaq Stock Market has reached \$1.35 or more on any trading day. If this condition is satisfied, the closing of the second tranche would occur immediately after the later of (i) the date of the stockholder approval or (ii) the date that the closing price was \$1.35 or more.

If the closing price of our common stock on the Nasdaq Stock Market has not yet reached \$1.35 or more, we have the option (exercisable until April 28, 2014) to request that the closing of the second tranche occur within 30 days. In this case, we would issue Series B-1 Shares to Ironridge and the closing of the second tranche would occur immediately after the later of (i) the date of the stockholder approval or (ii) the 30th day following our notice to Ironridge.

The Series B Preferred Shares will not be listed on any national securities exchange. There is no established public trading market for the Series B Preferred Shares, and we do not expect a market to develop. Our common stock is quoted on The NASDAQ Global Market under the symbol "ASTI." On October 28, 2013, the last reported sale price of our common stock on The NASDAQ Global Market was \$0.90.

Pursuant to General Instruction I.B.6 of Form S-3, in no event will we sell our securities in a public primary offering with a value exceeding more than one-third of our public float in any 12-month period so long as our public float remains below \$75.0 million. On the date of this prospectus supplement, the aggregate market value of our outstanding voting and non-voting common equity as calculated pursuant to General Instruction I.B.6 is approximately \$45.1 million. During the 12 calendar months prior to and including the date of this prospectus supplement, we have not offered any securities pursuant to General Instruction I.B.6 to Form S-3. For purposes of this calculation we have used the closing price on October 22, 2013, which was \$1.07.

Investing in our securities involves risks. See "Risk Factors," beginning on page S-6 and the risk factors discussed in our most recent Annual Report on Form 10-K, each subsequently filed quarterly report on Form 10-Q and other information we file from time to time with the Securities and Exchange Commission.

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 supplement or the accompanying prospectus. Any representation to the contrary is a criminal offense.

The date of this prospectus supplement is October 30, 2013.

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ABOUT THIS PROSPECTUS SUPPLEMENT

This document is in two parts. The first part is this prospectus supplement, which describes the specific terms of the offering and also adds to and updates information contained in the accompanying prospectus and the documents incorporated by reference into this prospectus supplement and the accompanying prospectus. The second part, the accompanying prospectus dated February 3, 2012, including the documents incorporated by reference, provides more general information. Generally, when we refer to this prospectus, we are referring to both parts of this document combined. To the extent there is a conflict between the information contained in this prospectus supplement, on the one hand, and the information contained in the accompanying prospectus or in any document incorporated by reference that was filed with the Securities and Exchange Commission, or SEC, before the date of this prospectus supplement, on the other hand, you should rely on the information in this prospectus supplement. If any statement in one of these documents is inconsistent with a statement in another document having a later date, the statement in the document having the later date modifies or supersedes the earlier statement. You should read this prospectus supplement and the accompanying prospectus, including the information incorporated by reference and any free writing prospectus that we may provide to you in connection with this offering, in their entirety before making an investment decision.

You should rely only on the information contained or incorporated by reference in this prospectus supplement and the accompanying prospectus, along with the information contained in any free writing prospectus that we may provide to you in connection with this offering. We have not authorized anyone to provide you with different or additional information. You should assume that the information appearing in this prospectus supplement, the accompanying prospectus, the documents incorporated by reference in this prospectus supplement and the accompanying prospectus, and in any free writing prospectus that we may provide to you in connection with this offering is accurate only as of the respective dates of those documents. Our business, financial condition, results of operations and prospects may have changed since those dates.

As used in this prospectus supplement, the terms “Ascent,” “we,” “us” and “our” refer to Ascent Solar Technologies, Inc.

PROSPECTUS SUPPLEMENT SUMMARY

The following summary highlights selected information contained elsewhere in this prospectus supplement, the accompanying prospectus and the documents incorporated by reference in this prospectus supplement and the accompanying prospectus. It does not contain all the information you will need in making your investment decision. You should carefully read this entire prospectus supplement, the accompanying prospectus and the documents that they incorporate by reference. You should pay special attention to the “Risk Factors” section of this prospectus supplement beginning on page S-6 and our Annual Report on Form 10-K for the year ended December 31, 2012 and each subsequently filed annual report on Form 10-K and quarterly report on Form 10-Q.

OUR BUSINESS

Overview

We are a development stage company formed in October 2005 to commercialize flexible photovoltaic (“PV”) modules using proprietary technology. Our technology was initially developed at ITN Energy Systems, Inc. (“ITN”) beginning in 1994 and subsequently assigned and licensed to us. Our proprietary manufacturing process deposits multiple layers of materials, including a thin film of highly efficient copper-indium-gallium-diselenide (“CIGS”) semiconductor material, on a flexible, lightweight, plastic substrate using a roll-to-roll process and then laser patterns the layers to create interconnected PV cells, or PV modules, in a process known as monolithic integration.

We believe that our technology and manufacturing process, which results in a lighter, flexible module package, provides us with a unique market opportunity relative to both the crystalline silicon (“c-Si”) based PV manufacturers that currently lead the PV market, as well as other thin-film PV manufacturers that use substrate materials such as

glass, stainless steel or other metals that can be heavier and more rigid than plastics.

We believe that our use of CIGS on a flexible, durable, lightweight, high tech plastic substrate will allow for unique and seamless integration of our PV modules into a variety of electronics products, defense, transportation and space applications, as well as other products and applications that may emerge.

Recent Strategic Developments

Introduction of EnerPlex™ Consumer Products

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Following the appointment of our new President and CEO in February 2012, we began to reposition our business model with an immediate focus into developing downstream consumer products. In June 2012, we launched our new EnerPlex brand line of consumer products, and introduced the first product under the EnerPlex brand with a solar-assisted charger for the iPhone® 4/4S smart phone featuring our ultra-light CIGS thin film technology.

This charger incorporates our ultra-light and thin solar module into a sleek, protective iPhone® 4/4S case, along with a thin battery. The charger adds minimal weight and size to an iPhone® smart phone, yet provides significantly improved battery life by harnessing sunlight for electric power. With this line of products we plan to move up the value chain with a much improved profit margin as products are developed and designed in-house and sold directly to end consumers or through distributors globally.

This charger is the first product in our planned line of smart phone chargers and related consumer portable power products. We intend to introduce a wide range of EnerPlex solutions for a variety of consumer products.

In August 2012, we announced the launch of the second version of Surftr™, a solar assisted charger for the Samsung® Galaxy S® III, which provides 85% additional battery life.

In December 2012, we launched the EnerPlex Kickr™ and EnerPlex Jumpr™ product series. The EnerPlex Kickr IV is an extremely portable, compact and durable solar charging device, approximately seven inches by seven inches when folded, and weighing only 316 grams, or less than half a pound. The Kickr IV provides 4.5 watts regulated power that can help charge phones, tablets, digital cameras, and other devices. Complementing the Kickr IV is the Jumpr 4400 and the Jumpr 4800, rechargeable, portable battery packs providing from three to five complete charge cycles for a smart phone. Currently, we are working to develop the iPhone® 5 and Samsung Galaxy S® 4 versions of the Surftr solar assisted charger. Our consumer products are available to customers through third party distributors and retailers and through our website at www.goEnerPlex.com, our retail website.

We continue to design and manufacture PV integrated consumer electronics, as well as portable power applications for commercial and military users, and we have adjusted our equipment utilization to meet our near term sales forecast. Products in these consumer oriented markets are priced based on the overall product value proposition as compared with directly competitive products or substitute products rather than on a cost per watt basis, typically used in commodity solar markets.

In 2013, we launched our new retail relationship with Fry's Electronics Inc., a premier California-based retailer. Our entire EnerPlex series of consumer solar-integrated products is now available at all Fry's retail locations, as well as online through www.frys.com. In addition, the EnerPlex line is now listed at Walmart.com and Newegg.com. We also established a number of additional distributor relationships to reach consumers internationally. We also launched our retail presence in Colorado through the operation of sales kiosks at Denver International Airport (Concourse B) as well as malls in the Denver metropolitan area, and also at the world famous Red Rocks Amphitheater.

In addition, we announced our agreement with the Denver Broncos Football Club to become a 'Hometown Sponsor' for the NFL franchise, an agreement which will include in-stadium advertising rights at Sports Authority Field at Mile High and promotional rights for our EnerPlex products.

For the balance of 2013, we plan to continue our expansion of distribution channels in the U.S. and worldwide.

Suqian Joint Venture

On July 2, 2013, we entered into a framework agreement (the "Suqian Agreement") for the establishment of a joint venture with the Government of the Municipal City of Suqian in Jiangsu Province, China ("Suqian"). The agreement

covers a multi-faceted, three-phase project. Completion of all three phases would involve an anticipated investment of up to \$500 million over six years, primarily funded by Suqian.

Under the Suqian Agreement, in the first phase we will form a joint venture entity (“JV”) with Suqian, in which we will have majority interest of up to 80%. The JV will build a factory to manufacture our proprietary photovoltaic modules. We will contribute proprietary technology and intellectual property, approximately \$1.6 million in cash and certain equipment from our Colorado facility. Suqian will provide cash of approximately \$32.5 million as well as rent-free use of a 270,000 square foot factory that is currently being built in the Suqian Economic & Industrial Development Science Park. The total project size of phase one under the agreement is expected to be approximately \$160 million. We will have the right to purchase this factory within the first five years at the initial construction cost, as well as the right to purchase Suqian's ownership interest in the JV for a modest nominal cost above Suqian's cash investment.

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The implementation of the Suqian Agreement, including the formation of the JV entity, will be subject to a number of contractual conditions and governmental approvals. Such conditions and approvals must be obtained in the future in order for the Suqian factory to be built and become operational.

Need for Additional Capital

Since inception, the Company has incurred significant losses. The Company expects to continue to incur net losses in the near term. For the six months ended June 30, 2013, our cash used in operations was \$10.0 million. At June 30, 2013, the Company had cash and equivalents of approximately \$4.0 million. At September 30, 2013, the Company had cash and equivalents of approximately \$3.9 million.

Following the completion of this offering, the Company believes it will need to raise additional capital at some point during 2014 in order to continue the current level of operations through the end of 2014 and into 2015. There is no assurance that the Company will be able to raise such additional capital on acceptable terms or at all. If the Company's revenues do not increase rapidly, and/or additional financing is not obtained, the Company will be required to significantly curtail operations to reduce costs and/or sell assets. Such actions would likely have an adverse impact on the Company's future operations.

Corporate Information

We are incorporated under the laws of Delaware. Our principal business office is located at 12300 Grant Street, Thornton, Colorado 80241, and our telephone number is (720) 872-5000. Our website address is www.ascentsolar.com. Information contained on our website or any other website does not constitute part of this prospectus supplement.

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The Offering

Securities offered

Up to \$10,000,000 of our Series B Preferred Shares. Up to 8,695,653 shares of common stock issuable upon conversion of the Series B Preferred Shares. Also, additional shares of common stock that we may choose to issue in payment of dividends on the Series B Preferred Shares.

Offering price

The per share purchase price for the Series B Preferred Shares will be \$10,000.

Manner of offering

The Series B Preferred Shares will be issued directly to Ironridge pursuant to a Stock Purchase Agreement between us and Ironridge. The Series B Preferred Shares will be issued and sold to Ironridge in two tranches.

In the first tranche, we are offering 500 Series B-1 Shares to Ironridge at a purchase price for each Series B-1 Share of \$10,000 per share. We expect the first tranche to close shortly after the date of this prospectus supplement. In the second tranche, we are offering either 500 Series B-1 Shares or 500 Series B-2 Shares (but not both) to Ironridge at a purchase price for each Series B-1 Share or B-2 Share of \$10,000 per share.

The second tranche will not close until after our stockholders approve the issuance of the second tranche shares in accordance with Nasdaq Listing Rule 5635(d). If our stockholders do not vote to approve the issuance of the second tranche securities, then the second tranche will not close and we would not receive the related proceeds.

The shares issued in the second tranche will be Series B-2 Shares if the closing price of our common stock on the Nasdaq Stock Market has reached \$1.35 or more on any trading day. If this condition is satisfied, the closing of the second tranche would occur immediately after the later of (i) the date of the stockholder approval or (ii) the date that the closing price was \$1.35 or more.

If the closing price of our common stock on the Nasdaq Stock Market has not yet reached \$1.35 or more, we have the option (exercisable until April 28, 2014) to request that the closing of the second tranche occur within 30 days. In this case, we would issue Series B-1 Shares to Ironridge and the closing of the second tranche would occur immediately after the later of (i) the date of the stockholder approval or (ii) the 30th day following our notice to Ironridge.

Use of Proceeds

We intend to use the net proceeds from this offering for working capital, including to fund the continued operations and expansion of our retail channels for our EnerPlex products in the U.S., Europe and Asia, brand building, as well as the launch of additional EnerPlex products. See “Use of Proceeds” on page S-17.

Market for the Series B Preferred Shares

We will not receive any proceeds resulting from the sale by Ironridge of common stock issued to Ironridge in respect of the Series B Preferred Shares offered hereby.

There is no established public trading market for the Series B Preferred Shares and we do not expect a market to develop. In addition, we do not intend to apply for listing of the Series B Preferred Shares on any securities exchange.

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| Market for our common stock | Our common stock is quoted on The Nasdaq Global Market under the symbol "ASTI". |
| Risk Factors | This investment involves a high degree of risk. See "Risk Factors" beginning on page S-6 of this prospectus supplement as well as the other information included in or incorporated by reference in this prospectus supplement and the accompanying prospectus for a discussion of risks you should consider carefully before making an investment decision. |

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Series B Preferred Shares

Dividends

Holders of the Series B Preferred Shares will be entitled to dividends in the amount of 5.75% per annum, payable when, as and if declared by the Board of Directors in its discretion. The dividend rate on the Series B Preferred Shares is indexed to the Company's stock price and subject to adjustment in certain circumstances.

The dividend rate on the Series B-1 Shares shall adjust upward by 98.880 basis points for each \$0.05 that the volume weighted average price of our common stock on any trading day as of which the dividend rate is determined and calculated is below \$1.00, subject to a maximum dividend rate of 15%.

The dividend rate on the Series B-1 Shares shall adjust downward by 98.880 basis points for each \$0.05 that the volume weighted average price of our common stock on any trading day as of which the dividend rate is determined and calculated is above \$1.30, subject to a minimum dividend rate of 3%.

The dividend rate on the Series B-2 Shares shall adjust upward by 98.880 basis points for each \$0.10 that the volume weighted average price of our common stock on any trading day as of which the dividend rate is determined and calculated is below \$1.20, subject to a maximum dividend rate of 15%.

The dividend rate on the Series B-2 Shares shall adjust downward by 98.880 basis points for each \$0.10 that the volume weighted average price of our common stock on any trading day as of which the dividend rate is determined and calculated is above \$1.80, subject to a minimum dividend rate of 3%.

The Company has the option to pay dividends on the Series B Preferred Shares in cash or in additional shares of common stock. If the Company elects to pay in the form of common stock, the number of shares to be issued shall be calculated by using the lesser of (i) 92% of the volume weighted average price for the common stock over a 60 day measuring period or (ii) the lowest single day closing price for the common stock occurring during such measuring period.

Conversion rights

The Series B-1 Shares will be convertible into common stock at a fixed conversion price of \$1.15 per share of common stock. The Series B-2 Shares (if issued) will be convertible into common stock at a fixed conversion price of

\$1.50 per share of common stock. The Series B Preferred Shares may be converted into shares of common stock at any time at the option of the holder. The Series B Preferred Shares may also be converted into shares of common stock at the option of the Company if the closing price of the common stock exceeds \$2.00 for 20 consecutive trading days.

In addition to the issuance of the applicable number of conversion shares, upon any conversion of Series B Preferred Shares the Company will also pay to the holder an “embedded dividend liability” amount equal to the dividends (calculated at the then applicable dividend rate) on the converted Series B Preferred Shares for a full five year period from the date of issue (less any period for which dividends have previously been paid). Such embedded dividend liability amount may be paid in cash or, at the Company’s option, additional shares of common stock. If the Company elects to pay the embedded dividend liability amount in the form of common stock, the number of shares to be issued shall be calculated by using the lesser of (i) 92% of the volume weighted average price for the common stock over a 60 day measuring period or (ii) the lowest single day closing price for the common stock occurring during such measuring period.

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| Redemption | <p>Upon or after the fifth anniversary of the initial issuance date of the Series B Preferred Shares, the Company will have the right, at its option, to redeem for cash all or a portion of the Series B Preferred Shares at a price per share equal to \$10,000 plus any accrued but unpaid dividends (the “Series B Liquidation Value”).</p> <p>At any time prior to the fifth anniversary of the date of the initial issuance of Series B Preferred Shares, the Company will have the option to redeem for cash all or a portion of the Series B Preferred Shares at a price per share equal to (a) \$10,000 plus (b) the “embedded dividend liability” amount equal to the dividends on the redeemed Series B Preferred Shares for a full five year period from the date of issue (less any period for which dividends have previously been paid).</p> |
| Liquidation value | <p>Upon our liquidation, dissolution or winding up, holders of Series B Preferred Shares will be entitled to be paid out of our assets, on a parity with holders of our common stock and our Series A preferred stock, an amount equal to \$10,000 per share plus any accrued but unpaid dividends thereon.</p> |
| Voting rights | <p>Except as otherwise required by law (or with respect to approval of certain actions), the Series B Preferred Shares will not have voting rights.</p> |

Please see “Description of Series B Preferred Stock” beginning on page S-17 for more information.

RISK FACTORS

Investing in our securities involves a high degree of risk. Before making an investment in our securities, you should carefully consider the risk factors set forth below and discussed under the section captioned “Risk Factors” contained in our Annual Report on Form 10-K for the year ended December 31, 2012 and each subsequently filed annual report on Form 10-K and quarterly report on Form 10-Q, which are incorporated by reference in this prospectus supplement and the accompanying prospectus in their entirety, together with the other information contained in this prospectus supplement, the accompanying prospectus and the documents we have incorporated by reference. If one or more of the possibilities described below or in the “Risk Factors” section of our Annual Report on Form 10-K for the year ended December 31, 2012 or Forms 10-K or Forms 10-Q filed thereafter actually occur, our operating results and financial condition would likely suffer and the trading price of our common stock could fall, causing you to lose some or all of your investment in the securities we are offering.

Risks Relating to Our Business

We have a limited history of operations, have not generated significant revenue from operations and have had limited production of our PV modules.

We have a limited operating history and have generated limited revenue from operations. Currently we are producing consumer oriented products in quantities necessary to meet current demand. Under our current business plan, we expect losses to continue until annual revenues and gross margins reach a high enough level to cover operating expenses. Based upon preliminary data, for the quarter ended September 30, 2013, the Company expects to post revenue of \$275,000.

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We plan to continue manufacturing at our current facilities and we are leveraging contract manufacturers in Asia for components and for final assembly of finished goods. Our ability to achieve our business, commercialization and expansion objectives will depend on a number of factors, including whether:

- we can generate customer acceptance of and demand for our products;
- we successfully ramp up commercial production on the equipment installed;
- our products are successfully and timely certified for use in our target markets;
- we successfully operate production tools to achieve the efficiencies, throughput and yield necessary to reach our cost targets;
- the products we design are saleable at a price sufficient to generate profits;
- our strategic alliance with TFG Radiant Investment Group Ltd. ("TFG Radiant") results in the design, manufacture and sale of sufficient products to achieve profitability;
- we raise sufficient capital to enable us to reach a level of sales sufficient to achieve profitability on terms favorable to us;
- we are able to be successful in designing, manufacturing, marketing, distributing and selling our newly introduced line of consumer oriented products;
- we effectively manage the planned ramp up of our operations;
- we successfully develop and maintain strategic relationships with key partners, including OEMs, system integrators and distributors, who deal directly with end users in our target markets;
- our ability to maintain the listing of our common stock on the NASDAQ Global Market or Capital Market;
- our ability to achieve projected operational performance and cost metrics;
- our ability to enter into commercially viable licensing, joint venture, or other commercial arrangements; and
- availability of raw materials.

Each of these factors is critical to our success, and accomplishing each of these tasks may take longer or cost more than expected, or may never be accomplished. It also is likely that problems that we cannot now anticipate will arise. If we cannot overcome these problems, our business, results of operations and financial condition could be materially and adversely affected.

We have to date incurred net losses and may be unable to generate sufficient sales in the future to become profitable.

Since inception, the Company has incurred significant losses. The Company expects to continue to incur net losses in the near term. For the six months ended June 30, 2013, we incurred a net loss of \$14.1 million. We incurred a net loss of \$28.8 million for the year ended December 31, 2012 and reported an accumulated deficit of \$211.8 million as of December 31, 2012. We expect to incur net losses in the near term. Our ability to achieve profitability depends on a number of factors, including market acceptance of our consumer oriented products at competitive prices. If we are unable to generate sufficient revenue to achieve profitability and positive cash flows, we may be unable to satisfy our commitments and may have to discontinue operations.

We will need to raise additional capital in order to continue its current level of operations into 2015.

Since inception, the Company has incurred significant losses and the Company expects to continue to incur net losses in the near term. For the six months ended June 30, 2013, our cash used in operations was \$10.0 million. At June 30, 2013, the Company had cash and equivalents of approximately \$4.0 million. At September 30, 2013, the company had cash and equivalents of \$3.9 million.

Following the completion of this offering, the Company believes it will need to raise additional capital at some point during 2014 in order to continue the current level of operations through the end of 2014 and into 2015. There is no assurance that the Company will be able to raise such additional capital on acceptable terms or at all. If the Company's

revenues do not increase rapidly, and/or additional financing is not obtained, the Company will be required to significantly curtail operations to reduce costs and/or sell assets. Such actions would likely have an adverse impact on the Company's future operations.

Our newly introduced EnerPlex line of consumer oriented products exposes us to many new risks and uncertainties.

Following the appointment of our new President and CEO in February 2012, we repositioned our business model with an immediate focus into developing downstream consumer products. In 2012 we launched our new EnerPlex brand line of consumer products, and introduced the first product under the EnerPlex brand with a solar assisted mobile phone charger incorporating our CIGS PV thin film technology. This new line of consumer oriented products exposes us to many risks and uncertainties that are new to our business.

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We have extremely limited experience in the design, manufacture, marketing, distribution and sale of consumer oriented products. Our ability to be successful with our newly introduced line of consumer oriented products will depend on a number of factors, including whether:

- we can achieve and maintain customer acceptance of our new consumer oriented products;
- we can rapidly develop and successfully introduce large numbers of new consumer oriented products in response to changing consumer preferences, the introduction of new consumer electronics products (such as new mobile phone models) that our EnerPlex products are designed to integrate with, and the introduction of new products by competing manufacturers;
- we can maintain an adequate level of product quality over multiple consumer oriented products which must be designed, manufactured and introduced rapidly to keep pace with changing consumer preferences and competitive factors;
- we can successfully manage our third party contract manufacturers located outside the U.S. on whom we are heavily dependent for the production of our consumer oriented products;
- we can successfully distribute our consumer oriented products through distributors, wholesalers, internet retailers and brick and mortar retailers (many of whom distribute products from competing manufacturers) on whom we are heavily dependent; and
- we can successfully manage the substantial inventory and other asset risks associated with the manufacture and sale of consumer electronic products, given the rapid and unpredictable pace of product obsolescence in such consumer markets.

Our business is based on a new and unproven technology, and if our PV modules or processes fail to achieve the performance and cost metrics that we expect, then we may be unable to develop demand for our PV modules and generate sufficient revenue to support our operations.

Our CIGS on flexible plastic substrate technology is a new and unproven technology in commercial scale production. Our business plan and strategies assume that we will be able to achieve certain milestones and metrics in terms of throughput, uniformity of cell efficiencies, yield, encapsulation, packaging, cost and other production parameters. We cannot assure you that our technology will prove to be commercially viable in accordance with our plan and strategies. Further, we or our strategic partners and licensees may experience operational problems with such technology after its commercial introduction that could delay or defeat the ability of such technology to generate revenue or operating profits. If we are unable to achieve our targets on time and within our planned budget, then we may not be able to develop adequate demand for our PV modules, and our business, results of operations and financial condition could be materially and adversely affected.

Our failure to further refine our technology and develop and introduce improved PV products could render our PV modules uncompetitive or obsolete and reduce our net sales and market share.

Our success requires that we invest significant financial resources in research and development to keep pace with technological advances in the solar energy industry. However, research and development activities are inherently uncertain, and we could encounter practical difficulties in commercializing our research results. Our expenditures on research and development may not be sufficient to produce the desired technological advances, or they may not produce corresponding benefits. Our PV modules may be rendered obsolete by the technological advances of our competitors, which could harm our results of operations and adversely impact our net sales and market share.

Failure to expand our manufacturing capability successfully at our facilities or through our strategic alliances would adversely impact our ability to sell our products into our target markets and would materially and adversely affect our business, results of operations and financial condition.

Our growth plan calls for production and operation at our own facilities and at contract manufacturers in Asia. Successful operations will require substantial engineering and manufacturing resources and is subject to significant risks, including risks of cost overruns and delays, risks that we may not be able to successfully operate. Furthermore, we may never be able to operate our production processes in high volume or at the volumes projected, make planned process and equipment improvements, attain projected manufacturing yields or desired annual capacity, obtain timely delivery of components, or hire and train the additional employees and management needed to scale our operations. Failure to meet these objectives on time and within our planned budget could materially and adversely affect our business, results of operations and financial condition.

We may be unable to manage the expansion of our operations and strategic alliances effectively.

We will need to significantly expand our operations and form beneficial strategic alliances in order to reduce manufacturing costs through economies of scale and partnerships, secure contracts of commercially material amounts with reputable customers and capture a meaningful share of our target markets. To manage the expansion of our operations and alliances, we will be required to improve our operational and financial systems, oversight, procedures and controls and expand, train and manage our growing

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employee base. Our management team will also be required to maintain and cultivate our relationships with partners, customers, suppliers and other third parties and attract new partners, customers and suppliers. In addition, our current and planned operations, personnel, facility size and configuration, systems and internal procedures and controls, even when augmented through strategic alliances, might be inadequate or insufficient to support our future growth. If we cannot manage our growth effectively, we may be unable to take advantage of market opportunities, execute our business strategies or respond to competitive pressures, resulting in a material and adverse effect to our business, results of operations and financial condition.

We depend on a limited number of third party suppliers for key raw materials, and their failure to perform could cause manufacturing delays and impair our ability to deliver PV modules to customers in the required quality and quantity and at a price that is profitable to us.

Our failure to obtain raw materials and components that meet our quality, quantity and cost requirements in a timely manner could interrupt or impair our ability to manufacture our PV modules or increase our manufacturing cost. Most of our key raw materials are either sole-sourced or sourced by a limited number of third party suppliers. As a result, the failure of any of our suppliers to perform could disrupt our supply chain and impair our operations. Many of our suppliers are small companies that may be unable to supply our increasing demand for raw materials as we implement our planned expansion. We may be unable to identify new suppliers in a timely manner or on commercially reasonable terms. Raw materials from new suppliers may also be less suited for our technology and yield PV modules with lower conversion efficiencies, higher failure rates and higher rates of degradation than PV modules manufactured with the raw materials from our current suppliers.

Our continuing operations will likely require additional capital which we may not be able to obtain on favorable terms, if at all or without dilution to our stockholders.

With the receipt of the \$10.0 million gross proceeds from this offering, the Company believes it will not require additional cash liquidity to continue operations through the end of the 2013 year. The Company will need to raise additional capital, however, to continue the current level of operations through the end of 2014 and into 2015. Our planned production ramp up and continuing operations will require additional capital. If we raise additional funds through the issuance of equity or convertible debt securities, the percentage ownership of our existing stockholders could be significantly diluted, and these newly issued securities may have rights, preferences or privileges senior to those of existing stockholders. If we raise additional funds through debt financing, which may involve restrictive covenants, our ability to operate our business may be restricted. We cannot assure you that additional financing will be available on terms favorable to us, or at all. If adequate funds are not available or are not available on acceptable terms, if and when needed, our ability to fund our operations, take advantage of unanticipated opportunities, develop or enhance our products, expand capacity or otherwise respond to competitive pressures could be significantly limited, and our business, results of operations and financial condition could be materially and adversely affected.

In addition, the terms of a loan we obtained from the Colorado Housing and Finance Authority (“CHFA”) in connection with our purchase and improvement of our Thornton, Colorado facility contain covenants that limit our ability, without the consent of CHFA, to create or incur additional indebtedness (other than obligations created or incurred in the ordinary course of business); merge or consolidate with any other entity; or make loans or advances to our officers, shareholders, directors or employees. The presence of these negative covenants gives CHFA the ability to bar us from engaging in certain transactions in the future that we may determine are necessary or advisable to meet our business objectives, including debt offerings and acquisitions of or by other companies. If CHFA were to withhold its written consent under these or other circumstances, we could be forced to prepay such loans at a premium, which could adversely affect our business, results of operations and financial condition.

Future sales or the potential for future sales of our securities may cause the trading price of our common stock to decline and could impair our ability to raise capital.

Sales of a substantial number of shares of our common stock or other securities in the public markets, or the perception that these sales may occur, could cause the market price of our common stock or other securities to decline and could materially impair our ability to raise capital through the sale of additional securities.

Our products may never gain sufficient market acceptance, in which case we would be unable to sell our products or achieve profitability.

Demand for our products may never develop sufficiently, and our products may never gain market acceptance, if we fail to produce products that compare favorably against competing products on the basis of cost, quality, weight, efficiency and performance. Demand for our products also will depend on our ability to develop and maintain successful relationships with key partners, including distributors, retailers, OEMs, system integrators and value added resellers. If our products fail to gain market

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acceptance as quickly as we envision or at all, our business, results of operations and financial condition could be materially and adversely affected.

We are targeting emerging markets for a significant portion of our planned product sales. These markets are new and may not develop as rapidly as we expect, or may not develop at all.

Our target markets include consumer electronics, defense and portable power, transportation, space and near space and BIPV/BAPV. Although certain areas of these markets have started to develop, we believe they are in their infancy. We believe these markets have significant long term potential, however, some or all of these markets may not develop and emerge as we expect. If the markets do develop as expected, there may be other products that could provide a superior product or a comparable product at lower prices than our products. If these markets do not develop as we expect, or if competitors are better able to capitalize on these markets our revenues and product margins may be negatively affected.

Failure to consummate strategic relationships with key partners in our various target market segments, such as consumer electronics, defense and portable power, transportation, space and near space and BIPV/BAPV, and the respective implementations of the right strategic partnerships to enter these various specified markets, could adversely affect our projected sales, growth and revenues.

We intend to sell thin film PV modules for use in consumer electronics, defense and portable power systems, transportation, space and near space solar panel applications and BIPV/BAPV. Our marketing and distribution strategy is to form strategic relationships with distributors and value added resellers to provide a foothold in these target markets. If we are unable to successfully establish working relationships with such market participants or if, due to cost, technical or other factors, our products prove unsuitable for use in such applications; our projected revenues and operating results could be adversely affected.

If sufficient demand for our products does not develop or takes longer to develop than we anticipate, we may be unable to grow our business, generate sufficient revenue to attain profitability or continue operations.

The solar energy industry is at a relatively early stage of development, and the extent to which PV modules, including our own, will be widely adopted is uncertain. If PV technology proves unsuitable for widespread adoption or if demand for PV modules fails to develop sufficiently, we may be unable to grow our business, generate sufficient sales to attain profitability or continue operations. Many factors, many of which are outside of our control, may affect the viability of widespread adoption of PV technology and demand for PV modules.

We face intense competition from other manufacturers of thin-film PV modules and other companies in the solar energy industry.

The solar energy and renewable energy industries are both highly competitive and continually evolving as participants strive to distinguish themselves within their markets and compete with the larger electric power industry. We believe that our main sources of competition are other thin film PV manufacturers and companies developing other solar solutions, such as solar thermal and concentrated PV technologies. Many of our existing and potential competitors have substantially greater financial, technical, manufacturing and other resources than we do. A competitor's greater size provides them with a competitive advantage because they often can realize economies of scale and purchase certain raw materials at lower prices.

Many of our competitors also have greater brand name recognition, established distribution networks and large customer bases. In addition, many of our competitors have well-established relationships with our current and potential partners and distributors and have extensive knowledge of our target markets. As a result of their greater

size, these competitors may be able to devote more resources to the research, development, promotion and sale of their products or respond more quickly to evolving industry standards and changes in market conditions than we can. Our failure to adapt to changing market conditions and to compete successfully with existing or future competitors could materially and adversely affect our business, results of operations and financial condition.

Problems with product quality or performance may cause us to incur warranty expenses, damage our market reputation and prevent us from maintaining or increasing our market share.

We may also be subject to warranty or product liability claims against us that are not covered by insurance or are in excess of our available insurance limits. In addition, quality issues can have various other ramifications, including delays in the recognition of revenue, loss of revenue, loss of future sales opportunities, increased costs associated with repairing or replacing products, and a negative impact on our goodwill and reputation. The possibility of future product failures could cause us to incur substantial

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expenses to repair or replace defective products. Furthermore, widespread product failures may damage our market reputation and reduce our market share and cause sales to decline.

The interests of our largest stockholder, TFG Radiant, may conflict with our interests or your interests now or in the future.

As of October 30, 2013, TFG Radiant owned approximately 29% of our common stock. In addition, should TFG Radiant exercise its option to acquire more shares of common stock, we expect that it would hold over 37% of our voting stock. As a result of its large holding of our shares, TFG Radiant may have the ability to prevent any transaction that requires the approval of stockholders regardless of whether other stockholders believe that any such transaction is in their own best interests, with the exception of certain agreements TFG Radiant has made pursuant to the Amended and Restated Stockholders Agreement. TFG Radiant also has certain registration rights that could impact shareholders. Additionally, TFG Radiant currently holds two seats on our Board of Directors, which affords TFG Radiant greater control and influence over matters affecting our business.

In addition, on February 1, 2012, Mr. Victor Lee was appointed by our Board as our President and Chief Executive Officer. Mr. Lee is the managing director of Tertius Financial Group Pte Ltd, the joint venture partner with Radiant Group in TFG Radiant.

TFG Radiant may from time to time acquire and hold interests in businesses that compete directly or indirectly with us. TFG Radiant also may pursue opportunities (including by acquisition) that may be adverse to, or be in direct or indirect competition with us. Additionally, our potential customers may be competitors of TFG Radiant and our interests in selling to those customers could be divergent from TFG Radiant's competitive interests. So long as TFG Radiant continues to own a significant amount of the outstanding shares of our common stock and Mr. Lee is President and Chief Executive Officer, TFG Radiant may be able to strongly influence or effectively control our decisions.

Currency translation risk may negatively affect our net sales, cost of equipment, cost of sales, gross margin or profitability and could result in exchange losses.

Although our reporting currency is the U.S. dollar, we may conduct business and incur costs in the local currencies of other countries in which we operate, make sales or buy equipment or materials. As a result, we are subject to currency translation risk. Our future contracts and obligations may be exposed to fluctuations in currency exchange rates; and, as a result, our capital expenditures or other costs may exceed what we have budgeted. Further, changes in exchange rates between foreign currencies and the U.S. dollar could affect our net sales and cost of sales and could result in exchange losses. We cannot accurately predict future exchange rates or the overall impact of future exchange rate fluctuations on our business, results of operations and financial condition.

A significant increase in the price of our raw materials could lead to higher overall costs of production, which would negatively affect our planned product margins, or make our products uncompetitive in the PV market.

Our raw materials include high temperature plastics and various metals. Significant increases in the costs of these raw materials may impact our ability to compete in our target markets at a price sufficient to produce a profit.

Our intellectual property rights or our means of enforcing those rights may be inadequate to protect our business, which may result in the unauthorized use of our products or reduced sales or otherwise reduce our ability to compete.

Our business and competitive position depends upon our ability to protect our intellectual property rights and proprietary technology, including any PV modules that we develop. We attempt to protect our intellectual property

rights, primarily in the United States, through a combination of patent, trade secret and other intellectual property laws, as well as licensing agreements and third party nondisclosure and assignment agreements. Because of the differences in foreign patent and other laws concerning intellectual property rights, our intellectual property rights may not receive the same degree of protection in foreign countries as they would in the United States. Our failure to obtain or maintain adequate protection of our intellectual property rights for any reason could have a material adverse effect on our business, results of operations and financial condition. Further, any patents issued in connection with our efforts to develop new technology for PV modules may not be broad enough to protect all of the potential uses of our technology.

We also rely on unpatented proprietary technology. It is possible that others will independently develop the same or similar technology or otherwise obtain access to our unpatented technology. To protect our trade secrets and other proprietary information, we require our employees, consultants and advisors to execute proprietary information and invention assignment agreements when they begin working for us. We cannot assure you that these agreements will provide meaningful protection of our trade secrets, know-how or other proprietary information in the event of any unauthorized use, misappropriation or disclosure of any such trade secrets, know-how or other proprietary information. Despite our efforts to protect this information, unauthorized parties may

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attempt to obtain and use information that we regard as proprietary. If we are unable to maintain the proprietary nature of our technologies, we could be materially adversely affected.

In addition, when others control the prosecution, maintenance and enforcement of certain important intellectual property, such as technology licensed to us, the protection and enforcement of the intellectual property rights may be outside of our control. If the entity that controls intellectual property rights that are licensed to us does not adequately protect those rights, our rights may be impaired, which may impact our ability to develop, market and commercialize our products. Further, if we breach the terms of any license agreement pursuant to which a third party licenses us intellectual property rights, our rights under that license may be affected and we may not be able to continue to use the licensed intellectual property rights, which could adversely affect our ability to develop, market and commercialize our products.

If third parties claim that we are infringing or misappropriating their intellectual property rights, we could be prohibited from selling our PV products, be required to obtain licenses from third parties or be forced to develop non-infringing alternatives, and we could be subject to substantial monetary damages and injunctive relief.

The PV industry is characterized by the existence of a large number of patents and frequent litigation based on allegations of patent infringement. We are aware of numerous issued patents and pending patent applications owned by third parties that may relate to current and future generations of solar energy. The owners of these patents may assert that the manufacture, use or sale of any of our products infringes one or more claims of their patents. Moreover, because patent applications can take many years to issue, there may be currently pending applications, unknown to us, which may later result in issued patents that materially and adversely affect our business. Third parties could also assert claims against us that we have infringed or misappropriated their intellectual property rights. Whether or not such claims are valid, we cannot be certain that we have not infringed the intellectual property rights of such third parties. Any infringement or misappropriation claim could result in significant costs or substantial damages to our business or an inability to manufacture, market or sell any of our PV modules that are found to infringe or misappropriate. Even if we were to prevail in any such action, the litigation could result in substantial cost and diversion of resources that could materially and adversely affect our business. The large number of patents, the rapid rate of new patent issuances, the complexities of the technology involved and uncertainty of litigation increase the risk of business assets and management's attention being diverted to patent litigation. Even if obtaining a license were feasible, it could be costly and time consuming. We might be forced to obtain additional licenses from our existing licensors in the event that the scope of the intellectual property we have licensed is too narrow to cover our activities, or in the event that the licensor did not have sufficient rights to grant us the license(s) purported granted. Also, some of our licenses may restrict or limit our ability to grant sublicenses and/or assign rights under the licenses to third parties, which may limit our ability to pursue business opportunities.

Our future success depends on retaining our Chief Executive Officer and existing management team and hiring and assimilating new key employees and our inability to attract or retain key personnel would materially harm our business and results of operations.

Our success depends on the continuing efforts and abilities of our executive officers, including Mr. Victor Lee, our President and Chief Executive Officer, our other executive officers, and key technical personnel. Our future success also will depend on our ability to attract and retain highly skilled employees, including management, technical and sales personnel. The loss of any of our key personnel, the inability to attract, retain or assimilate key personnel in the future, or delays in hiring required personnel could materially harm our business, results of operations and financial condition.

Our PV modules contain limited amounts of cadmium sulfide, and claims of human exposure or future regulations could have a material adverse effect on our business, results of operations and financial condition.

Our PV modules contain limited amounts of cadmium sulfide, which is regulated as a hazardous material due to the adverse health effects that may arise from human exposure, and is banned in certain countries. We cannot assure you that human or environmental exposure to cadmium sulfide used in our PV modules will not occur. Any such exposure could result in third party claims against us, damage to our reputation and heightened regulatory scrutiny of our PV modules. Future regulation relating to the use of cadmium in various products could force us to seek regulatory exemptions or impact the manufacture and sale of our PV modules and could require us to incur unforeseen environmental related costs. The occurrence of future events such as these could limit our ability to sell and distribute our PV modules, and could have a material adverse effect on our business, results of operations and financial condition.

Environmental obligations and liabilities could have a substantial negative impact on our financial condition, cash flows and profitability.

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We are subject to a variety of federal, state, local and foreign laws and regulations relating to the protection of the environment, including those governing the use, handling, generation, processing, storage, transportation and disposal of, or human exposure to, hazardous and toxic materials (such as the cadmium used in our products), the discharge of pollutants into the air and water, and occupational health and safety. We are also subject to environmental laws which allow regulatory authorities to compel, or seek reimbursement for, cleanup of environmental contamination at sites now or formerly owned or operated by us and at facilities where our waste is or has been disposed. We may incur significant costs and capital expenditures in complying with these laws and regulations. In addition, violations of, or liabilities under, environmental laws or permits may result in restrictions being imposed on our operating activities or in our being subjected to substantial fines, penalties, criminal proceedings, third party property damage or personal injury claims, cleanup costs or other costs. Also, future developments such as more aggressive enforcement policies, the implementation of new, more stringent laws and regulations, or the discovery of presently unknown environmental conditions or non-compliance may require expenditures that could have a material adverse effect on our business, results of operations and financial condition.

Further, greenhouse gas emissions have increasingly become the subject of international, national, state and local attention. Although future regulations could potentially lead to an increased use of alternative energy, there can be no guarantee that such future regulations will encourage solar technology. Given our limited history of operations, it is difficult to predict future environmental expenses.

We currently anticipate having substantial international operations that will subject us to a number of risks, including potential unfavorable political, regulatory, labor and tax conditions in foreign countries.

We expect to expand our operations abroad in the future and, as a result, we may be subject to the legal, political, social and regulatory requirements and economic conditions of foreign jurisdictions. Risks inherent to international operations, include, but are not limited to, the following:

- difficulty in procuring supplies and supply contracts abroad;
- difficulty in enforcing agreements in foreign legal systems;
- foreign countries imposing additional withholding taxes or otherwise taxing our foreign income, imposing tariffs or adopting other restrictions on foreign trade and investment, including currency exchange controls;
- inability to obtain, maintain or enforce intellectual property rights;
- risk of nationalization;
- changes in general economic and political conditions in the countries in which we may operate, including changes in the government incentives we might rely on;
- unexpected adverse changes in foreign laws or regulatory requirements, including those with respect to environmental protection, export duties and quotas;
- difficulty with staffing and managing widespread operations;
- trade barriers such as export requirements, tariffs, taxes and other restrictions and expenses, which could increase the prices of our products and make us less competitive in some countries; and
- difficulty of and costs relating to compliance with the different commercial and legal requirements of the international markets in which we plan to offer and sell our PV modules.

Our business in foreign markets will require us to respond to rapid changes in market conditions in these countries. Our overall success as an international business depends, in part, on our ability to succeed in differing legal, regulatory, economic, social and political conditions. If we are not able to develop and implement policies and strategies that are effective in each location where we will do business, then our business, results of operations and financial condition could be materially and adversely affected.

Existing regulations and policies and changes to these regulations and policies may present technical, regulatory and economic barriers to the purchase and use of PV products, which may significantly reduce demand for our PV products.

The market for electricity generation products is heavily influenced by foreign, U.S., state and local government regulations and policies concerning the electric utility industry, as well as policies promulgated by electric utilities. These regulations and policies often relate to electricity pricing and technical interconnection of customer-owned electricity generation. In the United States and in a number of other countries, these regulations and policies have been modified in the past and may be modified again in the future. These regulations and policies could deter end-user purchases of PV products and investment in the research and development of PV technology. For example, without a mandated regulatory exception for PV systems, utility customers are often charged interconnection or standby fees for putting distributed power generation on the electric utility grid. These fees could increase the cost to our end-users of using PV systems and make them less desirable, thereby harming our business, prospects, results of operations and financial condition. In addition, electricity generated by PV systems mostly competes with expensive

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peak hour electricity, rather than the less expensive average price of electricity. Modifications to the peak hour pricing policies of utilities, such as to a flat rate, would require PV systems to achieve lower prices in order to compete with the price of electricity from other sources.

We anticipate that our PV modules and their use in installations will be subject to oversight and regulation in accordance with national and local ordinances relating to building codes, safety, environmental protection, utility interconnection and metering and related matters. It is difficult to track the requirements of individual states and design equipment to comply with the varying standards. Any new government regulations or utility policies pertaining to PV modules may result in significant additional expenses to us, our business partners and their customers and, as a result, could cause a significant reduction in demand for our PV modules.

Risks Relating to our Securities and an Investment in Our Common Stock

As a public company we are subject to complex legal and accounting requirements that require us to incur substantial expenses, and our financial controls and procedures may not be sufficient to ensure timely and reliable reporting of financial information, which, as a public company, could materially harm our stock price and listing on the NASDAQ Global Market.

As a public company, we are subject to numerous legal and accounting requirements that do not apply to private companies. The cost of compliance with many of these requirements is substantial, not only in absolute terms but, more importantly, in relation to the overall scope of the operations of a small company. Failure to comply with these requirements can have numerous adverse consequences including, but not limited to, our inability to file required periodic reports on a timely basis, loss of market confidence, delisting of our securities and/or governmental or private actions against us. We cannot assure you that we will be able to comply with all of these requirements or that the cost of such compliance will not prove to be a substantial competitive disadvantage vis-à-vis our privately held and larger public competitors.

The Sarbanes-Oxley Act of 2002 (“Sarbanes-Oxley”) requires, among other things, that we maintain effective internal control over financial reporting and disclosure controls and procedures. In particular, we must perform system and process evaluation and testing of our internal control over financial reporting to allow management to report on the effectiveness of our internal control over financial reporting, as required by Section 404 of Sarbanes-Oxley. Our compliance with Section 404 of Sarbanes-Oxley will require that we incur substantial accounting expense and expend significant management efforts. The effectiveness of our controls and procedures may in the future be limited by a variety of factors, including:

- faulty human judgment and simple errors, omissions or mistakes;
- fraudulent action of an individual or collusion of two or more people;
- inappropriate management override of procedures; and
- the possibility that any enhancements to controls and procedures may still not be adequate to assure timely and accurate financial information.

If we are not able to comply with the requirements of Section 404 in a timely manner, or if we or our independent registered public accounting firm identifies deficiencies in our internal control over financial reporting that are deemed to be material weaknesses, we may be subject to NASDAQ delisting, investigations by the SEC and civil or criminal sanctions.

Our ability to successfully implement our business plan and comply with Section 404 requires us to be able to prepare timely and accurate financial statements. We expect that we will need to continue to improve existing, and implement new operational, financial and accounting systems, procedures and controls to manage our business effectively.

Any delay in the implementation of, or disruption in the transition to, new or enhanced systems, procedures or controls may cause our operations to suffer, and we may be unable to conclude that our internal control over financial reporting is effective as required under Section 404 of Sarbanes-Oxley. If we are unable to complete the required Section 404 assessment as to the adequacy of our internal control over financial reporting, if we fail to maintain or implement adequate controls, our ability to obtain additional financing could be impaired. In addition, investors could lose confidence in the reliability of our internal control over financial reporting and in the accuracy of our periodic reports filed under the Exchange Act. A lack of investor confidence in the reliability and accuracy of our public reporting could cause our stock price to decline.

The price of our common stock may continue to be volatile.

Our common stock is currently traded on the NASDAQ Global Market. The trading price of our common stock from time to time has fluctuated widely and may be subject to similar volatility in the future. For example, for the 2013 year through September 30, 2013, our common stock traded as low as \$0.51 and as high as \$1.16. In 2012, our common stock traded as low as \$0.42 and

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as high as \$1.94, and in 2011, traded as low as \$0.36 and as high as \$3.95. The trading price of our common stock in the future may be affected by a number of factors, including events described in these “Risk Factors.” In recent years, broad stock market indices, in general, and smaller capitalization and PV companies, in particular, have experienced substantial price fluctuations. In a volatile market, we may experience wide fluctuations in the market price of our common stock. These fluctuations may have a negative effect on the market price of our common stock regardless of our operating performance. In the past, following periods of volatility in the market price of a company's securities, securities class action litigation has often been instituted. A securities class action suit against us could result in substantial costs, potential liabilities and the diversion of management's attention and resources, and could have a material adverse effect on our financial condition.

We are not currently in compliance with the minimum bid price rule of the NASDAQ Global Market and a delisting could limit the liquidity of our stock, increase its volatility and hinder our ability to raise capital.

Under the rules of the NASDAQ Global Market, listed companies are required to maintain a share bid price of at least \$1.00 per share and if the closing share bid price stays below \$1.00 for a period of 30 consecutive business days, then the listed company would have a cure period of at least 180 days for the purpose of regaining compliance with the \$1.00 per share bid price minimum. As reported in our Current Report on Form 8-K filed on September 23, 2013, we received notice from the NASDAQ Global Market that we were not in compliance with the minimum bid price rule. If our share price does not sustain an increase sufficient for us to re-gain compliance during the relevant cure period ending on March 18, 2014, we may be subject to de-listing procedures. As reported in our Current Reports on Form 8-K filed on December 7, 2012 and June 7, 2013, in the past we have not been in compliance with the minimum bid price rule. In both of those instances, our share price increased to a level that resulted in us being able to re-gain compliance.

We are considering various options that will enable us to avoid de-listing should the current cure period expire, including a transfer to the NASDAQ Capital Market in order to extend the time that we have to regain compliance. In order to maintain our listing, our Board of Directors could attempt to implement a reverse stock split in an effort to increase our stock price to a level that would result in compliance with the minimum bid price rule. A reverse stock split would require approval by the Company's stockholders. In June 2013, our stockholders approved a potential reverse stock split which our Board of Directors has the discretion to implement at any time up to June 2014.

If our common stock is delisted by NASDAQ, our common stock may be eligible for quotation on an over-the-counter quotation system or on the pink sheets. Upon any such delisting, our common stock would become subject to the regulations of the SEC relating to the market for penny stocks. A penny stock is any equity security not traded on a national securities exchange that has a market price of less than \$5.00 per share. The regulations applicable to penny stocks may severely affect the market liquidity for our common stock and could limit the ability of shareholders to sell securities in the secondary market. In such a case, an investor may find it more difficult to dispose of or obtain accurate quotations as to the market value of our common stock, and there can be no assurance that our common stock will be eligible for trading or quotation on any alternative exchanges or markets.

Delisting from NASDAQ could adversely affect our ability to raise additional financing through public or private sales of equity securities, would significantly affect the ability of investors to trade our securities and would negatively affect the value and liquidity of our common stock. Delisting could also have other negative results, including the potential loss of confidence by employees, the loss of institutional investor interest and fewer business development opportunities.

Future sales or the potential for future sales of our securities may cause the trading price of our common stock to decline and could impair our ability to raise capital through subsequent equity offerings.

Sales of a substantial number of shares of our common stock or other securities in the public markets, or the perception that these sales may occur, could cause the market price of our common stock or other securities to decline and could materially impair our ability to raise capital through the sale of additional securities.

If you purchase the securities sold in this offering, you may experience dilution if we issue additional equity securities in future fundraising transactions.

If we issue additional common stock, or securities convertible into or exchangeable or exercisable for common stock, our stockholders, including investors who purchase shares in this offering, will experience dilution, and any such issuances may result in downward pressure on the price of our common stock.

Current stockholders will be diluted by the issuance of shares related to the Seow private placement which occurred in June 2013 and also the issuance of shares related to this offering, including shares that would be issued if we elect to pay

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dividends, make-whole and similar amounts on the Series A Preferred Stock and the Series B Preferred Shares in the form of common stock.

The terms of the Seow Purchase Agreement may result in the future issuance of significant additional shares of common stock by the Company including (i) up to 2,625,000 shares of common stock issuable upon the exercise of the Warrants, (ii) up to 7,500,000 shares of common stock issuable upon conversion of the Series A Preferred Stock, and (iii) an indeterminate number of additional shares in the event that the Company elects to pay dividends and make-whole amounts (if any) due on the Series A Preferred Stock in the form of shares rather than cash.

The terms of this offering of Series B Preferred Shares may also result in the future issuance of significant additional shares of common stock by the Company including (i) up to approximately 8.7 million shares of common stock issuable upon conversion of the Series B Preferred Shares, and (ii) an indeterminate number of additional shares in the event that the Company elects to pay dividends and embedded dividend liability amounts (if any) due on the Series B Preferred Shares in the form of shares rather than cash.

We may issue substantial amounts of common stock in connection with the Series B Preferred Shares. If we issue Series B-1 Preferred Shares in both tranches, we would be required to issue approximately 8.7 million shares of common stock to Ironridge upon conversion of all Series B-1 Preferred Shares. In addition, upon such conversion we would owe Ironridge (to the extent dividends had not been previously paid) an embedded dividend liability amount that could be as much as \$10.1 million if the maximum dividend rate of 15% would apply (which would be the case if the applicable trading price for the common stock was \$0.50 or lower). If the Company elects to pay the applicable embedded dividend liability by issuing additional shares, the Company would be required to issue additional shares to Ironridge using a formula price based on (among other things) the trading price for the common stock at such time. If, for example, the formula price required to be used at such time was \$0.45 per share, then we would have to issue approximately 22.4 million shares to Ironridge to satisfy the \$10.1 million embedded dividend liability amount. Pursuant to the terms of the Series B Preferred Shares, the actual amount of the embedded dividend liability that might apply and the actual number of shares that we might have to issue can vary substantially (upward or downward) based on a number of different facts and circumstances.

To the extent we issue common stock in payment of the make-whole or embedded dividend liability amounts (if any) upon the redemption or conversion of the Series A Preferred Stock or the Series B Preferred Shares, or elect to pay dividends on the Series A Preferred Stock or Series B Preferred Shares in the form of our common stock, rather than cash, such issuances will dilute the ownership interests of existing stockholders.

There is no public market for the Series B Preferred Shares being offered in this offering.

There is no established public trading market for the Series B Preferred Shares being offered in this offering, and we do not expect a market to develop. In addition, we do not intend to apply for listing of the Series B Preferred Shares on any securities exchange. Without an active market, the liquidity of the Series B Preferred Shares will be limited. Investors who convert their Series B Preferred Shares into common stock will incur immediate dilution in the net tangible book value per share of the common stock issuable upon conversion.

Upon conversion of Series B Preferred Shares, you will experience immediate and substantial dilution because the per share conversion price of your shares of Series B Preferred Shares (\$1.15 or \$1.50 as applicable) will be higher than the net tangible book value per share of the outstanding common stock immediately after this offering. As of September 30, 2013, our tangible net book value per share was \$0.35.

Holders of the Series B Preferred Shares will have no rights as holders of common stock until they acquire common stock.

Until you acquire shares of common stock upon conversion of the Series B Preferred Shares, you will have no rights as a holder of our common stock, including rights to vote. Upon conversion of your Series B Preferred Shares, you will be entitled to exercise the rights of a holder of common stock only as to matters for which the record date occurs after the conversion date.

Some provisions of our charter documents and Delaware law may have anti-takeover effects that could discourage an acquisition of us by others, even if an acquisition would be beneficial to our stockholders, and may prevent attempts by our stockholders to replace or remove our current management.

Provisions in our Certificate of Incorporation and Bylaws, as well as provisions of Delaware law, could make it more difficult for a third party to acquire us, or for a change in the composition of our Board of Directors (our “Board”) or management to occur, even if doing so would benefit our stockholders. These provisions include:

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- authorizing the issuance of “blank check” preferred stock, the terms of which may be established and shares of which may be issued without stockholder approval;
- dividing our Board into three classes;
- limiting the removal of directors by the stockholders; and
- limiting the ability of stockholders to call a special meeting of stockholders.

In addition, we are subject to Section 203 of the Delaware General Corporation Law, which generally prohibits a Delaware corporation from engaging in any of a broad range of business combinations with an interested stockholder for a period of three years following the date on which the stockholder became an interested stockholder, unless such transactions are approved by our Board. This provision could have the effect of delaying or preventing a change of control, whether or not it is desired by or beneficial to our stockholders.

TFG Radiant, our largest stockholder, is exempt from the general prohibitions of Section 203 because the transaction by which it became an interested stockholder was approved by our Board. Because TFG Radiant has two representatives on our Board, it is less likely that a third party could become an interested stockholder without the consent of TFG Radiant.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference into it contain forward-looking statements within the meaning of Section 27A of the Securities Act and Section 21E of the Exchange Act. Forward-looking statements are those that predict or describe future events or trends and that do not relate solely to historical matters. You can generally identify forward-looking statements as statements containing the words “believe,” “expect,” “may,” “will,” “could,” “would,” “anticipate,” “intend,” “estimate,” “project,” “plan,” “continue,” “assume” or other similar expressions, although not all forward-looking statements contain these identifying words. All statements contained in this prospectus regarding our future strategy, plans and expectations regarding clinical trials, future regulatory approvals, our plans for the commercialization of our products, future operations, projected financial position, potential future revenues, projected costs, future prospects, and results that might be obtained by pursuing management's current plans and objectives are forward-looking statements. Forward-looking statements include, but are not necessarily limited to, those relating to:

- our limited operating history and lack of profitability;
- our ability to successfully design, manufacture and sell our newly introduced EnerPlex line of consumer products;
- our ability to develop demand for, and sales of, our photovoltaic products;
- our ability to successfully sell or license our products;
- our ability to attract and retain qualified personnel to implement our business plan and corporate growth strategies;
- our ability to develop sales, marketing, and distribution capabilities;
- the accuracy of our estimates and projections;
- our ability to secure additional financing to fund our short-term and long-term financial needs;
- our ability to maintain the listing of our common stock on the Nasdaq Global or Capital Market;
- the commencement or outcome of legal proceedings against us or by us, including ongoing litigation and proceedings;
- changes in our business plan and corporate strategies; and
- other risks and uncertainties discussed in greater detail in the section captioned “Risk Factors.”

You should not place undue reliance on our forward-looking statements because the matters they describe are subject to known and unknown risks, uncertainties and other unpredictable factors, many of which are beyond our control. Our forward-looking statements are based on the information currently available to us and speak only as of the date on the cover of this prospectus. New risks and uncertainties arise from time to time, and it is impossible for us to predict these matters or how they may affect us. Over time, our actual results, performance or achievements will likely differ from the anticipated results, performance or achievements that are expressed or implied by our forward-looking

statements, and such differences might be significant and materially adverse to our investors. We have no duty to, and do not intend to, update or revise the forward-looking statements in this prospectus after the date of this prospectus except to the extent required by the federal securities laws. You should consider all risks and uncertainties disclosed in our filings with the Securities and Exchange Commission, or the SEC, described in the sections of this prospectus supplement and the accompanying prospectus entitled “Where You Can Find More Information” and “Information Incorporated by Reference,” all of which are accessible on the SEC's website at www.sec.gov.

USE OF PROCEEDS

The amount of gross proceeds from this offering will be \$10 million (assuming both tranches of Series B Preferred Stock are issued). We intend to use the net proceeds from this offering for working capital, including the funding of continued operations, expansion of retail channels for our EnerPlex products in the U.S., Europe and Asia, brand building and the launch of additional

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EnerPlex products, and for other general corporate purposes. We will not receive any proceeds resulting from the sale by Ironridge of common stock issued to Ironridge in respect of the Series B Preferred Shares offered hereby.

RATIO OF EARNINGS TO COMBINED FIXED CHARGES AND PREFERRED STOCK DIVIDENDS

We did not have any earnings for the nine months ended September 30, 2013 or the years ended December 31, 2012, 2011, 2010, 2009 and 2008. For this reason, no ratios are provided for these periods.

PLAN OF DISTRIBUTION

On October 28, 2013, we entered into a Stock Purchase Agreement with Ironridge, pursuant to which we have agreed to issue and sell the Series B Preferred Shares directly to Ironridge.

We are offering the Series B Preferred Shares to Ironridge in two tranches. In the first tranche, we are offering 500 Series B-1 Shares to Ironridge at a purchase price for each Series B-1 Share of \$10,000 per share. We expect the first tranche to close shortly after the date of this prospectus supplement, resulting in gross proceeds to us of \$5,000,000. In the second tranche, we are offering either 500 Series B-1 Shares or 500 Series B-2 Shares (but not both) to Ironridge at a purchase price for each Series B-1 Share or B-2 Share of \$10,000 per share, which would result in additional gross proceeds to us of \$5,000,000.

The second tranche will not close until after our stockholders approve certain issuances of our shares related to this offering in accordance with Nasdaq Listing Rule 5635(d). That rule requires stockholders to approve certain stock issuances that may aggregate to 20% or more of our outstanding common stock. We intend to hold a special stockholder meeting as soon as practicable in order to obtain such approval. If our stockholders do not vote to approve such issuances of our shares in accordance with such rule, then the second tranche will not close and we would not receive the related proceeds.

The shares issued in the second tranche will be Series B-2 Shares if the closing price of our common stock on the Nasdaq Stock Market has reached \$1.35 or more on any trading day. If this condition is satisfied, the closing of the second tranche would occur immediately after the later of (i) the date of the stockholder approval or (ii) the date that the closing price was \$1.35 or more.

If the closing price of our common stock on the Nasdaq Stock Market has not yet reached \$1.35 or more, we have the option (exercisable until April 28, 2014) to request that the closing of the second tranche occur within 30 days. In this case, we would issue Series B-1 Shares to Ironridge and the closing of the second tranche would occur immediately after the later of (i) the date of the stockholder approval or (ii) the 30th day following our notice to Ironridge.

We have agreed to reimburse Ironridge for \$10,000 of their legal expenses in connection with this offering. We have agreed in the Stock Purchase Agreement to provide indemnification and contribution to Ironridge against certain liabilities, including liabilities under the Securities Act.

We estimate that the total expenses of the offering payable by us will be approximately \$100,000.

DESCRIPTION OF SERIES B PREFERRED STOCK

The terms of the Series B Preferred Shares will be contained in a certificate of designation that will amend our certificate of incorporation, as amended. The following description is a summary of the material provisions of the Series B Preferred Shares and the certificate of designation. It does not purport to be complete. We urge you to read the certificate of designation because it, and not this description, defines your rights as a holder of Series B Preferred

Shares. We will include the form of certificate of designation in a Current Report on Form 8-K that we will file with the Securities and Exchange Commission.

General

Our board of directors is authorized to cause us to issue, from our authorized but unissued shares of preferred stock, one or more series of preferred stock, to establish from time to time the number of shares to be included in each such series, and to fix the designation and any preferences, conversion and other rights, voting powers, restrictions, limitations as to dividends, qualifications and terms and conditions of redemption of the shares of each such series. Pursuant to this authority, prior to the closing of this offering, our board of directors will establish the terms of the Series B Preferred Shares, which are described below.

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When issued, the Series B Preferred Shares will be validly issued, fully paid and non-assessable. The holders of the Series B Preferred Shares will have no preemptive rights with respect to any of our stock or any securities convertible into or carrying rights or options to purchase any such stock. The Series B Preferred Shares will not be subject to any sinking fund or other obligation of us to redeem or retire the Series B Preferred Shares, but we may redeem the Series B Preferred Shares as described below under “Redemption”. Unless redeemed or repurchased by us, the Series B Preferred Shares will have a perpetual term with no maturity.

The Series B Preferred Shares will not be listed on any stock exchange or automated quotation system.

Rank

When and if issued, all of the Series B Preferred Shares will, with respect to dividend rights and rights upon our liquidation, dissolution or winding up, rank: (a) senior with respect to dividends to our common stock, (b) on a parity with respect to dividends with our existing Series A preferred stock, (c) on a parity with respect to rights of liquidation with our common stock and our existing Series A preferred stock, and (d) junior to all of our existing and future indebtedness.

Dividends

Holders of the Series B Preferred Shares will be entitled to dividends in the amount of 5.75% per annum, payable when, as and if declared by the Board of Directors in its discretion. The dividend rate on the Series B Preferred Shares is indexed to the Company's stock price and subject to adjustment in certain circumstances.

The dividend rate on the Series B-1 Shares shall adjust upward by 98.880 basis points for each \$0.05 that the volume weighted average price of our common stock on any trading day as of which the dividend rate is determined and calculated is below \$1.00, subject to a maximum dividend rate of 15%. The dividend rate on the Series B-1 Shares shall adjust downward by 98.880 basis points for each \$0.05 that the volume weighted average price of our common stock on any trading day as of which the dividend rate is determined and calculated is above \$1.30, subject to a minimum dividend rate of 3%.

The dividend rate on the Series B-2 Shares shall adjust upward by 98.880 basis points for each \$0.10 that the volume weighted average price of our common stock on any trading day as of which the dividend rate is determined and calculated is below \$1.20, subject to a maximum dividend rate of 15%. The dividend rate on the Series B-2 Shares shall adjust downward by 98.880 basis points for each \$0.10 that the volume weighted average price of our common stock on any trading day as of which the dividend rate is determined and calculated is above \$1.80, subject to a minimum dividend rate of 3%.

The Company has the option to pay dividends on the Series B Preferred Shares in cash or in additional shares of common stock. If the Company elects to pay in the form of common stock, the number of shares to be issued shall be calculated by using the lesser of (i) 92% of the volume weighted average price for the common stock over a 60 day measuring period or (ii) the lowest single day closing price for the common stock occurring during such measuring period.

Conversion

The Series B-1 Shares will be convertible into common stock at a fixed conversion price of \$1.15 per share of common stock. The Series B-2 Shares (if issued) will be convertible into common stock at a fixed conversion price of \$1.50 per share of common stock. The Series B Preferred Shares may be converted into shares of common stock at

any time at the option of the holder. The Series B Preferred Shares may also be converted into shares of common stock at the option of the Company if the closing price of the common stock exceeds \$2.00 for 20 consecutive trading days.

In addition to the issuance of the applicable number of conversion shares, upon any conversion of Series B Preferred Shares the Company will also pay to the holder an “embedded dividend liability” amount equal to the dividends (calculated at the then applicable dividend rate) on the converted Series B Preferred Shares for a full five year period from the date of issue (less any period for which dividends have previously been paid). Such embedded dividend liability amount may be paid in cash or, at the Company’s option, additional shares of common stock. If the Company elects to pay the embedded dividend liability amount in the form of common stock, the number of shares to be issued shall be calculated by using the lesser of (i) 92% of the volume weighted average price for the common stock over a 60 day measuring period or (ii) the lowest single day closing price for the common stock occurring during such measuring period.

Redemption

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Upon or after the fifth anniversary of the initial issuance date of the Series B Preferred Shares, the Company will have the right, at its option, to redeem for cash all or a portion of the Series B Preferred Shares at a price per share equal to \$10,000 plus any accrued but unpaid dividends (the "Series B Liquidation Value").

At any time prior to the fifth anniversary of the date of the initial issuance of Series B Preferred Shares, the Company will have the option to redeem for cash all or a portion of the Series B Preferred Shares at a price per share equal to (a) \$10,000 plus (b) the "embedded dividend liability" amount equal to the dividends on the redeemed Series B Preferred Shares for a full five year period from the date of issue (less any period for which dividends have previously been paid).

Liquidation Value

Upon our liquidation, dissolution or winding up, holders of Series B Preferred Shares will be entitled to be paid out of our assets, on a parity with holders of our common stock and our Series A preferred stock, an amount equal to \$10,000 per share plus any accrued but unpaid dividends thereon

Voting Rights; Conversion; Transfer

Except as otherwise required by law (or with respect to approval of certain actions), the Series B Preferred Shares will not have voting rights.

DESCRIPTION OF SECURITIES

Our authorized capital stock consists of 125,000,000 shares of common stock, \$0.0001 par value, and 25,000,000 shares of preferred stock, \$0.0001 par value. Prior to this offering, 750,000 shares had been designated as Series A Preferred Stock. As of October 30, 2013, we had 59,162,698 shares of common stock and 362,390 shares of Series A preferred stock outstanding.

The following is a summary of the rights of our common stock, preferred stock and certain outstanding rights to obtain our common stock. For more detailed information about our capital stock, please see our certificate of incorporation and bylaws, both as amended (our "Certificate of Incorporation" and "Bylaws," respectively).

Common Stock

Holders of our common stock are entitled to one vote for each share on all matters submitted to a stockholder vote and may not cumulate their votes. Holders of common stock are entitled to share in all dividends that our Board of Directors (our "Board"), in its discretion, declares from legally available funds. In the event of our liquidation, dissolution or winding up, each outstanding share entitles its holder to participate pro rata in all assets that remain after payment of liabilities and after providing for each class of stock, if any, having preference over the common stock.

Except for TFG Radiant, which holds pre-emptive rights with respect to certain equity issuances by us (on terms no less favorable than any such issuance) in order to maintain their percentage ownership in our common stock, no other holders of our common stock have any conversion, preemptive or other subscription rights, and there are no redemption provisions applicable to our common stock. The rights of the holders of common stock are subject to any rights that may be fixed for holders of preferred stock.

Preferred Stock

Our Board is authorized by our Certificate of Incorporation to establish classes or series of preferred stock and fix the designation, powers, preferences and rights of the shares of each such class or series and the qualifications, limitations or restrictions thereof without any further vote or action by our stockholders. Any shares of preferred stock so issued could have priority over our common stock with respect to dividend or liquidation rights. Any future issuance of preferred stock may have the effect of delaying, deferring or preventing a change in our control without further action by our stockholders and may adversely affect the voting and other rights of the holders of our common stock.

The issuance of shares of preferred stock, or the issuance of rights to purchase such shares, could be used to discourage an unsolicited acquisition proposal. For instance, the issuance of a series of preferred stock might impede a business combination by including class voting rights that would enable a holder to block such a transaction. In addition, under certain circumstances, the issuance of preferred stock could adversely affect the voting power of holders of our common stock. Although our Board is required to make any determination to issue preferred stock based on its judgment as to the best interests of our stockholders, our Board

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could act in a manner that would discourage an acquisition attempt or other transaction that some, or a majority, of our stockholders might believe to be in their best interests or in which such stockholders might receive a premium for their stock over the then market price of such stock.

Series A Preferred Stock

On June 17, 2013, the Company entered into a Securities Purchase Agreement (the “Seow Purchase Agreement”) with Seng Wei Seow (“Seow”), pursuant to which Seow agreed to purchase from the Company, and we agreed to sell to Seow (subject to the terms and conditions set forth therein), an aggregate of \$6,000,000 of Series A Preferred Stock at a price of \$8.00 per share of Series A Preferred Stock and warrants to purchase up to 2,625,000 shares of common stock of the Company.

In connection with the Seow Purchase Agreement, the Company designated 750,000 shares of Series A Preferred Stock. The Series A Preferred Stock ranks senior to the Company's common stock with respect to dividend rights, *pari passu* with respect to rights upon liquidation to the Company's common stock, and junior to all existing and future indebtedness. Except as otherwise required by law (or with respect to approval of certain actions), the Series A Preferred Stock have no voting rights.

Holders of Series A Preferred Stock are entitled to cumulative dividends at a rate of 8.0% per annum (subject to adjustment in certain circumstances) when and if declared by the Board of Directors. The Company is obligated to pay certain make-whole amounts to the holders of Series A Preferred Stock, if the stock is redeemed or converted (as described below) prior to the fourth anniversary of its issuance date, in lieu of dividends that the stockholders would have otherwise received. The dividends and make-whole amounts (if any) may be paid in cash or in the form of common stock at the discretion of the Board of Directors.

The Company has the right to redeem all or a portion of the Series A Preferred Stock at any time at a redemption price of \$8.00 per share, plus any accrued and unpaid dividends and plus the make-whole amount (if any).

The Series A Preferred Stock may be converted into shares of Common Stock of the Company at any time at the option of the holder. In the event of a conversion by the holder, the price per share is equal to (a) Original Issue Price (as defined in the Certificate of Designation) multiplied by (b) the number of shares being converted, divided by (c) the conversion price of \$0.80.

A conversion by the Company may be effected if certain Equity Conditions (as defined in the Certificate of Designation) are met and in the event that the closing price of the Common Stock exceeds 200% of the conversion price for any 20 consecutive trading days. In the event of a Company conversion, the Company shall issue the number of shares of Common Stock equal to (a) the Original Issue Price multiplied by (b) the number of Series A Preferred Stock being converted, divided by (c) the conversion price of \$0.80.

Unless the Company has received the approval of the holders of a majority of the Series A Preferred Stock then outstanding, the Company shall not (i) alter or change adversely the powers, preferences or rights given to the Series A Preferred Stock or alter or amend the Certificate of Designation, (ii) authorize or create any class of stock ranking as to distribution of dividends senior to the Series A Preferred Stock, (iii) amend its certificate of incorporation or other charter documents in breach of any of the provisions in the Certificate of Designation, (iv) increase the authorized number of shares of Series A Preferred Stock, or (v) enter into any agreement with respect to the foregoing.

Upon any liquidation, dissolution or winding up of the Company, after payment or provision for payment of debts and other liabilities of the Company, the holders of Series A Preferred Stock shall be entitled to receive, *pari passu* with any distribution to the holders of common stock of the Company, an amount equal to \$8.00 per share of Series A

Preferred Stock plus any accrued and unpaid dividends.

At no time will the Company issue shares of common stock in connection with the securities issued pursuant to the Seow Purchase Agreement (whether upon exercise of Warrants (as defined below), conversion of Series A Preferred Stock, payment of dividends in common stock or payment of make-whole amounts in common stock) if such transaction (when aggregated with all other issuances in connection with the Seow Purchase Agreement) would result in the issuance of more than 19.999% of the amount of common stock of the Company issued and outstanding on the date of the Seow Purchase Agreement unless (i) the Company's stockholders shall have approved the issuance of shares of common stock in excess of 20%, or (ii) Nasdaq has provided a waiver of Listing Rule 5635(d).

Authorized but Unissued Shares

The authorized but unissued shares of common stock are available for future issuance without stockholder approval, unless otherwise required by law or applicable stock exchange rules. However, so long as any shares of Series A Preferred Stock are

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outstanding, the Company may not, without the affirmative approval of the holders of a majority of the shares of the Series A Preferred Stock, authorize or create any class of stock ranking as to distribution of dividends senior to the Series A Preferred.

Additional authorized but unissued shares may be used for a variety of corporate purposes, including future public offerings to raise additional capital, corporate acquisitions and employee benefit plans. The existence of authorized but unissued shares could hinder or discourage an attempt to obtain control of us by means of a proxy contest, tender offer, merger or otherwise.

Warrants

Under the Seow Purchase Agreement, the Company agreed to sell warrants (the “Warrants”) to purchase up to 2,625,000 shares of common stock of the Company at an exercise price of \$0.90 per share of common stock. The Warrants have a three year term until June 2016.

2005 Stock Option Plan

Our 2005 Stock Option Plan, as amended (the “Option Plan”), currently authorizes the grant of up to 3,700,000 shares of common stock (subject to adjustment for stock splits and similar capital changes) in connection with incentive stock option grants and non-qualified stock option grants. Employees and, in the case of nonqualified stock options, directors, consultants or other service providers are eligible to receive grants under our plans. According to the terms of the Option Plan, no employee may be granted, in any fiscal year, options to purchase more than 100,000 shares. As of September 30, 2013, there were outstanding and unexercised options to purchase 1,501,229 shares under our Option Plan.

2008 Restricted Stock Plan

Our 2008 Restricted Stock Plan, as amended (the “Stock Plan”), currently authorizes the grant of up to 1,550,000 shares of restricted common stock and restricted stock units (subject to adjustment for stock splits and similar capital changes) to employees, directors, consultants or other service providers. According to the terms of the Stock Plan, no individual may be granted, in any fiscal year, more than 200,000 shares. Vesting of shares of restricted stock granted under the Stock Plan may occur over a specified period of time or based upon performance metrics announced at the time of grant. As of September 30, 2013, 130,863 restricted stock units are currently unvested and outstanding under the Stock Plan. As of September 30, 2013, 756,017 shares remained available for future grant under the Stock Plan.

TFG Radiant Option

Pursuant to the Securities Purchase Agreement entered into on August 12, 2011 with TFG Radiant, we granted TFG Radiant an option to purchase 9,500,000 shares of our common stock. This option will only become exercisable under certain terms and conditions, including, among other things, TFG Radiant achieving certain performance milestones related to the construction of an initial PV module manufacturing facility located in Asia. This option will terminate if it becomes exercisable and then it is not exercised on or before February 12, 2014. If a change of control transaction occurs prior to such expiration date, this option will become immediately exercisable and will terminate unless exercised in connection with such change of control transaction. If this option becomes exercisable, the shares would be sold to TFG Radiant at a per share price equal to \$1.55 per share, or an aggregate of \$14,725,000.

Registration Rights

Pursuant to a stockholders agreement between us and TFG Radiant, TFG Radiant holds certain registration rights related to its shares. In addition, we granted Seow certain registration rights in connection with the execution of the Seow Purchase Agreement.

Anti-Takeover Effects of Certain Provisions of Delaware Law and Our Certificate of Incorporation and Bylaws

Our Certificate of Incorporation and Bylaws contain a number of provisions that could make our acquisition by means of a tender or exchange offer, a proxy contest or otherwise more difficult. These provisions are summarized below.

Removal of Directors. Our Bylaws provide that our directors may only be removed by the affirmative vote of the shares entitled to vote at an election of directors, or for cause by a majority of the Board. Although our Bylaws do not give the Board the power to approve or disapprove stockholder nominations for the election of directors or of any other business stockholders desire to conduct at an annual or any other meeting, the Bylaws may have the effect of precluding a nomination for the election of directors or precluding the conduct of business at a particular annual meeting if the proper procedures are not followed, or

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discouraging or deterring a third party from conducting a solicitation of proxies to elect its own slate of directors or otherwise attempting to obtain control, even if the conduct of that solicitation or attempt might be beneficial to our stockholders.

Staggered Board. Staggered terms tend to protect against sudden changes in management and may have the effect of delaying, deferring or preventing a change in our control without further action by our stockholders. Our Board is divided into three classes, with one class of directors elected at each year's annual stockholder meeting.

Special Meetings. Our Bylaws provide that special meetings of stockholders can be called by the President, at the request of a majority of the Board or at the written request of holders of at least 50% of the shares outstanding and entitled to vote.

Undesignated Preferred Stock. The ability to authorize undesignated preferred stock makes it possible for our Board of Directors to issue preferred stock with voting or other rights or preferences that could impede the success of any attempt to acquire us. These and other provisions may have the effect of deferring hostile takeovers or delaying changes in control or management of our Company.

Delaware Anti-Takeover Statute. We are subject to the provisions of Section 203 of the Delaware General Corporation Law regulating corporate takeovers. In general, Section 203 prohibits a publicly held Delaware corporation from engaging under certain circumstances in a business combination with an interested stockholder for a period of three years following the date the person became an interested stockholder unless:

Prior to the date of the transaction that resulted in the stockholder becoming an interested stockholder, the board of directors of the corporation approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder.

Upon completion of the transaction that resulted in the stockholder becoming an interested stockholder, the stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the number of shares outstanding (1) shares owned by persons who are directors and also officers and (2) shares owned by employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer.

On or subsequent to the date of the transaction that resulted in the stockholder becoming an interested stockholder, the business combination is approved by the board and authorized at an annual or special meeting of stockholders, and not by written consent, by the affirmative vote of at least 66²/₃% of the outstanding voting stock which is not owned by the interested stockholder.

Generally, a business combination includes a merger, asset or stock sale, or other transaction resulting in a financial benefit to the interested stockholder. An interested stockholder is a person who, together with affiliates and associates, owns or, within three years prior to the determination of interested stockholder status, did own 15% or more of a corporation's outstanding voting securities. We expect the existence of this provision to have an anti-takeover effect with respect to transactions our Board does not approve in advance. We also anticipate that Section 203 may also discourage attempts that might result in a premium over the market price for the shares of common stock held by stockholders.

The provisions of Delaware law, our Certificate of Incorporation and our Bylaws could have the effect of discouraging others from attempting hostile takeovers and, as a consequence, they may also inhibit temporary fluctuations in the market price of our common stock that often result from actual or rumored hostile takeover attempts. These provisions may also have the effect of preventing changes in our management. It is possible that these provisions could make it more difficult to accomplish transactions that stockholders may otherwise deem to be in their best interests.

Listing

Our common stock is listed on the Nasdaq Global Market under the trading symbol “ASTI.”

Transfer Agent and Registrar

The transfer agent and registrar of our common stock is Computershare Investor Services.

EXPERTS

The financial statements in our Annual Report on Form 10-K for the year ended December 31, 2012 have been audited by Hein & Associates LLP, an independent registered public accounting firm, to the extent and for the periods set forth in their report,

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and are incorporated in this prospectus supplement by reference in reliance upon such report and upon the authority of such firm as experts in accounting and auditing.

LEGAL MATTERS

Certain legal matters with respect to the securities of Series B Preferred Stock offered hereby will be passed upon for us by Faegre Baker Daniels LLP, Boulder, Colorado.

INFORMATION INCORPORATED BY REFERENCE

This prospectus supplement and the accompanying prospectus are part of a registration statement on Form S-3. The SEC allows this filing to “incorporate by reference” information that we previously filed with the SEC. This means we can disclose important information to you by referring you to other documents that we have filed with the SEC. The information that is incorporated by reference is considered part of this prospectus supplement, and information that we file later will automatically update and may supersede this information. For further information about us and the securities being offered, you should refer to the registration statement and the following documents that are incorporated by reference:

- Our annual report on Form 10-K filed on March 14, 2013, which contains audited financial statements for the fiscal year ended December 31, 2012;
- Our definitive proxy statement on Schedule 14A filed on April 29, 2013;
- Our quarterly reports on Form 10-Q filed on May 9, 2013 and August 8, 2013;
- Our current reports on Form 8-K filed on January 25, 2013, June 7, 2013, June 21, 2013, July 9, 2013, August 7, 2013, August 15, 2013, September 11, 2013, September 23, 2013, October 28, 2013, and October 30, 2013;
- All other reports filed by us pursuant to Section 13(a) or 15(d) of the Exchange Act since the end of the fiscal year covered by the annual report referred to above; and
- The description of our common stock contained in Forms 8-A filed on June 19, 2006 and August 8, 2006 and any amendments or reports filed for the purpose of updating such description.

All documents filed by us subsequent to those listed above with the SEC pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act and, prior to the termination of the offering, shall be deemed to be incorporated by reference into this prospectus supplement and to be a part hereof from the date of filing of such documents. Any statement contained in a document incorporated by reference herein shall be deemed to be modified or superseded for purposes of this prospectus supplement to the extent that a statement contained herein or in any other subsequently filed document which also is or is deemed to be incorporated by reference herein modifies or supersedes such statement. Any statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this prospectus supplement.

You may request a copy of all documents that are incorporated by reference in this prospectus by writing or telephoning us at the following address and number: Ascent Solar Technologies, Inc., Attention: Corporate Secretary, 12300 Grant Street, Thornton, Colorado 80241, (720) 872-5000. We will provide copies of all documents requested (not including exhibits to those documents, unless the exhibits are specifically incorporated by reference into those documents or this prospectus) without charge.

We file annual, quarterly and special reports, proxy statements and other information with the SEC. You may read and copy any document we file at the SEC’s Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for more information about the operation of the Public Reference Room. The SEC maintains an Internet site that contains reports, proxy and information statements, and other information regarding

issuers that file electronically with the SEC, including Ascent Solar Technologies, Inc. The SEC's Internet site can be found at www.sec.gov.

The information in this prospectus is not complete and may be changed. These securities may not be sold until the related registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any state where the offer or sale is not permitted.

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PROSPECTUS

ASCENT SOLAR TECHNOLOGIES, INC.

Up to \$25,000,000

COMMON STOCK

PREFERRED STOCK

WARRANTS

We may sell from time to time the securities offered by this prospectus at prices and on terms to be determined at or prior to the time of each sale. We will describe the specific terms and amounts of the securities offered in a prospectus supplement for each sale. You should carefully read this prospectus and any prospectus supplement before you invest. This prospectus may not be used to sell securities unless accompanied by a prospectus supplement.

Our common stock is traded on the Nasdaq Global Market under the symbol "ASTI." On February 3, 2012, the last reported sale price of our common stock on the Nasdaq Global Market was \$0.81 per share.

On the date of this prospectus, the aggregate market value of our outstanding voting and non voting common equity held by non-affiliates is \$20.0 million. Within the last 12 months we have not sold any securities pursuant to General Instruction I.B.6 to Form S-3.

Our principal executive offices are located at 12300 North Grant Street, Thornton, Colorado 80241.

These are speculative securities. Investing in these securities involves significant risks. You should purchase these securities only if you can afford a complete loss of your investment. See "Risk Factors" beginning on page 2.

This prospectus may not be used to consummate a sale of any securities unless accompanied by a prospectus supplement.

The securities offered by this prospectus may be sold directly by us to investors, through agents designated from time to time or to or through underwriters or dealers, on a continuous or delayed basis. For additional information on the methods of sale, you should refer to the section entitled "Plan of Distribution" in this prospectus. If any agents or underwriters are involved in the sale of any securities with respect to which this prospectus is being delivered, the names of such agents or underwriters and any applicable fees, commissions, discounts and over-allotment options will be set forth in a prospectus supplement. The price to the public of such securities and the net proceeds that we expect to receive from such sale will also be set forth in a prospectus supplement.

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 supplement is February 3, 2012

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In this prospectus, references to “we,” “us,” “our,” “Ascent,” “Ascent Solar” or the “Company” mean Ascent Solar Technologies, Inc.

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About This Prospectus

This prospectus is part of a Registration Statement on Form S-3 that we filed with the Securities and Exchange Commission (“SEC”) using a “shelf” registration process. Under this shelf process, we may sell any combination of securities described in this prospectus in one or more offerings, up to the total dollar amounts appearing on the cover of this prospectus. This prospectus provides you with a general description of the securities we may offer. Each time we offer the securities, a prospectus supplement will be provided that will contain specific information about the terms of the offering, including the types(s), amount(s) and price(s) of the securities being offered and the plan of distribution. The prospectus supplement for a particular offering may also add, update or change information contained in this prospectus. In addition, any prospectus supplement relating to a particular offering may be updated or supplemented. You should read carefully both this prospectus and any applicable prospectus supplement together with the additional information about us to which we refer you in the section of this prospectus entitled “Where You Can Find More Information.” This prospectus may not be used to consummate a sale of any securities unless accompanied by a prospectus supplement.

You should rely only on the information contained or incorporated by reference in this prospectus or a prospectus supplement. We have not authorized any other person to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. You should not assume that the information appearing in this prospectus, any prospectus supplement or any document incorporated by reference is accurate as of any date other than its date, regardless of the time of delivery of the prospectus or prospectus supplement or any sale of securities. Our business, financial condition, results of operations and prospects may have changed since those dates.

PROSPECTUS SUMMARY

This summary highlights information contained in this prospectus. While we believe that this summary highlights some of the most important information about Ascent Solar Technologies, Inc. and this offering, you should read this entire prospectus and the documents incorporated by reference carefully, including “Risk Factors,” before deciding to invest in our securities.

Overview

We are a development stage company formed in October 2005 to commercialize flexible photovoltaic (“PV”) modules using proprietary technology. Our technology was initially developed at ITN Energy Systems, Inc. (“ITN”) by our founder and core scientific team beginning in 1994 and subsequently assigned and licensed to us. Our proprietary manufacturing process deposits multiple layers of materials, including a thin film of highly efficient copper-indium-gallium-diselenide (“CIGS”) semiconductor material, on a flexible, lightweight, plastic substrate and then laser patterns the layers to create interconnected PV cells, or PV modules, in a process known as monolithic integration. We believe that our technology and manufacturing process provide us with significant advantages over both the crystalline silicon based PV manufacturers that currently dominate the PV market, as well as other thin-film PV manufacturers that use rigid and/or heavier substrate materials such as glass, stainless steel or other metals. Our target markets include the building integrated PV (“BIPV”) market, the building applied PV (“BAPV”) market, the electronic integrated PV (“EIPV”) market, the military and governmental portable power markets and the space and near-space markets.

We completed construction of our FAB1 production line in December 2007. In 2008 we began placing purchase orders for equipment to be installed in our second production facility (“FAB2”) and purchased an existing building in Thornton, Colorado. During 2008 and early 2009, the building was renovated to accommodate our manufacturing

requirements. In 2009, we began receiving production equipment in FAB2 and started qualification of the equipment. Throughout 2010, we continued qualification of the equipment in FAB2 and began production of PV modules.

Currently we are in limited production utilizing a combination of equipment from our FAB1 and FAB2 production lines. We are qualifying equipment that has been delivered and additional equipment is scheduled for delivery in 2012 and we have adjusted our utilization of equipment based on our near term forecast. Under our current business plan, we expect losses to continue until annual production reaches approximately 30 MW or more. We intend to augment our own manufacturing capabilities by licensing our proprietary manufacturing processes to others. We plan to continue manufacturing at our current facilities; however, our plans are to have significant future production capacity enabled through partnerships, joint ventures or other commercial or licensing arrangements. To date, we have financed our operations primarily through public and private equity financings.

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On August 12, 2011, we entered into an investment and strategic alliance with TFG Radiant Investment Group Ltd. and its affiliates (“TFG Radiant”), pursuant to which TFG Radiant made an initial \$7.36 million equity investment in us, and, in connection with such investment, received an option to acquire an additional 9,500,000 shares our common stock at an exercise price of \$1.55 per share.

In addition, in exchange for the grant by the Company of exclusive rights to manufacture and sell solar devices based on the Company's proprietary CIGS PV technology in East Asia (comprised of China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia, Korea and Singapore), TFG Radiant has committed to invest \$165 million to build an initial fab in East Asia using the Company's proprietary processes for manufacturing flexible CIGS PV, will provide consulting fees to the Company in connection with installation and commissioning of any fabs in East Asia, will provide license fees, royalty payments, and ownership interest in all East Asia fabs, and subject to the East Asia fabs meeting certain milestones related to production and costs, will provide over time incentive payments to the Company of up to \$250 million.

We believe that there remains strong interest in renewable energy in general and solar in particular, but existing global political and financial conditions are significantly disrupting key solar markets. Throughout 2011, there was a reduction in the then-current and expected average selling prices for PV modules. This was a result of many factors, most significantly the increased industry-wide manufacturing capacity, which has contributed to excess industry channel inventories, and a concurrent scaling back of government subsidies and incentives related to solar energy.

As a result of these recent significant adverse changes in market conditions, the Company concluded that the carrying value of its property, plant and equipment might not be recoverable. This analysis utilized projected selling prices and operating costs under alternative scenarios to arrive at total estimated undiscounted cash flows. As a result of the analysis, in the second quarter of 2011 the Company used discounted cash flows to calculate and record an impairment loss of \$78.0 million in the carrying value of property, plant and equipment and deposits on manufacturing equipment.

We are a development stage company and we have a history of net losses. As of September 30, 2011, we had an accumulated deficit of approximately \$177.4 million, including a net loss of approximately \$100.2 million for the nine months ended September 30, 2011 and a net loss of \$21.5 million for the nine months ended September 30, 2010.

As of December 31, 2011, the Company had approximately \$23.9 million in cash and investments. As discussed above, the Company is in the development stage and is currently incurring significant losses from operations as it works toward commercialization. The Company commenced limited production on its initial production line in the first quarter of 2009 and the second production line in 2010. The Company does not expect that sales revenue and cash flows from product revenue will be sufficient to support operations and cash requirements until actual full production capacity is achieved. Changes in the level of expected operating losses, the timing of planned capital expenditures or other factors may negatively impact cash flows and reduce current cash and investments faster than anticipated. The Company expects that it will need to raise additional capital in the future. There is no assurance that the Company will be able to raise additional capital on acceptable terms or at all.

Corporate Information

We are incorporated under the laws of Delaware. Our principal business office is located at 12300 North Grant Street, Thornton, Colorado 80241, and our telephone number is (720) 872-5000. Our website address is www.ascentsolar.com. Information contained on our website or any other website does not constitute part of this prospectus.

This Offering

Through this prospectus, we may from time to time offer and sell shares of our common stock, shares of our preferred stock, warrants, and the securities issuable upon exercise or conversion of any of those securities. We may offer and sell these securities separately or together as units, but the aggregate initial offering price will not to exceed \$25,000,000 or the equivalent amount denominated in one or more foreign currencies. Each time we offer and sell the securities, a prospectus supplement will be provided that will contain specific information about the terms of the offering, including the type(s), amounts(s) and price(s) of the securities being offered and the plan of distribution employed.

FORWARD-LOOKING STATEMENTS

This prospectus includes “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995. Forward-looking statements include statements concerning our plans, objectives, goals, strategies, future events, future

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net sales or performance, capital expenditures, financing needs, plans or intentions relating to acquisitions, business trends and other information that is not historical information and, in particular, appear under headings including “Prospectus Summary.” When used in this prospectus, the words “estimates,” “expects,” “anticipates,” “projects,” “plans,” “intends,” “believes,” “forecasts,” “foresees,” “likely,” “may,” “should,” “goal,” “target” and variations of such words or similar expressions are intended to identify forward-looking statements. All forward-looking statements are based upon information available to us on the date of this prospectus.

These forward-looking statements are subject to risks, uncertainties and other factors, many of which are outside of our control, that could cause actual results to differ materially from the results discussed in the forward-looking statements, including, among other things, the matters discussed in this prospectus in the section captioned “Risk Factors.” Factors you should consider that could cause these differences are:

- * Our limited operating history and lack of profitability;
- * Our ability to secure equity or debt or other financing necessary to fund our operations and the acquisition of additional operating capacity;
- * Our ability to meet the cost and performance metrics and to implement the production capacity that we have forecasted;
- * Our ability to develop demand for, and sales of, our photovoltaic modules and establish strategic relationships with key distribution partners, including original equipment manufacturers, system integrators and distributors;
- * Our ability to obtain necessary or desired certifications for our photovoltaic modules;
- * Whether we receive timely delivery of production tools from our equipment suppliers;
- * Our ability to design, purchase, install, qualify and operate production tools pursuant to our business plan and within budgeted amounts;
- * The extent to which we are able to reduce the per watt manufacturing costs of our photovoltaic modules, and the extent to which our competitors are able to do the same with their photovoltaic modules;
- * Global demand for electricity and the market for renewable energy, including solar energy;
- * The cost-effectiveness of photovoltaic-generated energy relative not only to that generated from conventional sources such as fossil fuels, but also to that generated from other renewable sources which include wind, biomass, geothermal and tidal power;
- * The availability of, or changes to, government policies, subsidies and incentives that affect the use or cost of renewable energy;
- * The emergence of disruptive or competing technologies in the energy industry;
- * Our competitive position and that of our photovoltaic modules relative to others in the photovoltaic and thin-film markets;
- * The extent to which our interests align with or deviate from those of TFG Radiant Investment Group Ltd. and Norsk Hydro Produksjon AS, our largest stockholders, and their affiliates;

- * Foreign currency exchange fluctuations, political instability in certain foreign markets or the general state of geopolitical affairs;
- * The supply and price of equipment, components and raw materials;

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- * The status of our relationship with ITN Energy Systems, Inc.;
- * Our ability to attract and retain key executives and employees;
- * Our continued investment in research and development, and our ability to remain competitive through development of new technologies;
- * The extent to which we are able to manage the expansion of our operations effectively, both domestically and abroad;
- * Commencement of legal proceedings against us or by us, including proceedings relating to environmental matters or intellectual property rights;
- * Our ability to expand and protect the intellectual property portfolio that relates to our photovoltaic modules and processes;
- * The extent to which we qualify to perform research and development under the federal government's Small Business Innovation Research program; and
- * General economic and business conditions.

There may be other factors that could cause our actual results to differ materially from the results referred to in the forward-looking statements. We undertake no obligation to publicly update or revise forward-looking statements to reflect subsequent events or circumstances after the date made or to reflect the occurrence of unanticipated events, except as required by law.

RISK FACTORS

An investment in our securities involves a high degree of risk and many uncertainties discussed in the section entitled "Risk Factors" in our annual report on Form 10-K for the year ended December 31, 2010, which is incorporated by reference into this prospectus. You should carefully consider the risk factors before purchasing our securities. If one or more of the possibilities described as risks actually occurs, our operating results and financial condition would likely suffer and the trading price of our securities could fall, causing you to lose some or all of your investment in the securities we are offering.

USE OF PROCEEDS

Unless otherwise indicated in the applicable prospectus supplement, we intend to use the net proceeds from the sale of any securities offered under this prospectus for general corporate purposes, including repayment and refinancing of debt, working capital and capital expenditures, research and development expenses, general and administrative expenses, or investment in technologies, products or assets that complement our business. We may temporarily invest the net proceeds in investment-grade and U.S. government interest-bearing securities until they are used for their stated purpose. We have not determined the amount of net proceeds to be used specifically for such purposes. As a result, management will retain broad discretion over the allocation of net proceeds.

DILUTION

If required by SEC rules, we will set forth in a prospectus supplement the following information regarding any material dilution of the equity interests of investors purchasing securities in an offering under this prospectus:

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- * the net tangible book value per share of our equity securities before and after the offering;
- * the amount of the increase in such net tangible book value per share attributable to the cash payments made by purchasers in the offering; and
- * the amount of the immediate dilution from the public offering price which will be absorbed by such purchasers.

PLAN OF DISTRIBUTION

We may sell the securities being offered hereby in one or more of the following ways from time to time:

through dealers or agents to the public or to investors;

to underwriters for resale to the public or to investors;

directly to investors; or

through a combination of such methods.

We may sell the securities at a fixed price or prices that may change, at prevailing market prices, at prices relating to prevailing market prices or at negotiated prices. Each time we sell securities in a particular offering, we will set forth in a prospectus supplement the terms of the offering of securities, including:

the material terms of the distribution, including the number of shares and the consideration paid;

the identity of any underwriters, dealers, agents or purchasers that will purchase the securities;

the type and amount of any compensation, discounts or commissions to be received by underwriters, dealers or agents;

the purchase price of the securities being offered and the proceeds we will receive from the sale;

- the nature of any transactions by underwriters, dealers or agents during the offering that are intended to stabilize or maintain the market price of our securities; and

the terms of any indemnification provisions.

Underwriters, dealers and agents that participate in the distribution of the securities may be deemed to be underwriters as defined in the Securities Act of 1933, as amended (the "Securities Act"), and any discounts or commissions they receive from us and any profit on their resale of the securities may be treated as underwriting discounts and commissions under the Securities Act. We will identify in the applicable prospectus supplement any underwriters, dealers or agents and will describe their compensation. We may have agreements with the underwriters, dealers and agents to indemnify them against specified civil liabilities, including liabilities under the Securities Act. Underwriters, dealers and agents may engage in transactions with or perform services for us or our subsidiary in the ordinary course of their businesses.

Certain persons that participate in the distribution of the securities may engage in transactions that stabilize, maintain or otherwise affect the price of the securities, including over-allotment, stabilizing and short-covering transactions in

such securities, and the imposition of penalty bids, in connection with an offering. Certain persons may also engage in passive market-making transactions as permitted by Rule 103 of Regulation M. Passive market makers must comply with applicable volume and price limitations and must be identified as passive market makers. In general, a passive market maker must display its bid at a price not in excess of the highest independent bid for such security; if all independent bids are lowered below the passive market maker's bid, however, the passive market maker's bid must then be lowered when certain purchase limits are exceeded.

DESCRIPTION OF SECURITIES

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Our authorized capital stock consists of 125,000,000 shares of common stock, \$0.0001 par value, and 25,000,000 shares of preferred stock, \$0.0001 par value. As of December 31, 2011 we had 39,345,459 shares of common stock and no shares of preferred stock outstanding.

The following is a summary of the rights of our common stock, preferred stock and certain outstanding rights to obtain our common stock. For more detailed information about our capital stock, please see our certificate of incorporation and bylaws, both as amended (our "Certificate of Incorporation" and "Bylaws," respectively).

Common Stock

Holders of our common stock are entitled to one vote for each share on all matters submitted to a stockholder vote and may not cumulate their votes. Holders of common stock are entitled to share in all dividends that our Board of Directors (our "Board"), in its discretion, declares from legally available funds. In the event of our liquidation, dissolution or winding up, each outstanding share entitles its holder to participate pro rata in all assets that remain after payment of liabilities and after providing for each class of stock, if any, having preference over the common stock.

Except for Norsk Hydro and TFG Radiant, which hold pre-emptive rights with respect to certain equity issuances by us (on terms no less favorable than any such issuance) in order to maintain their percentage ownership in our common stock, no other holders of our common stock have any conversion, preemptive or other subscription rights, and there are no redemption provisions applicable to our common stock. The rights of the holders of common stock are subject to any rights that may be fixed for holders of preferred stock.

Preferred Stock

Our Board is authorized by our Certificate of Incorporation to establish classes or series of preferred stock and fix the designation, powers, preferences and rights of the shares of each such class or series and the qualifications, limitations or restrictions thereof without any further vote or action by our stockholders. Any shares of preferred stock so issued could have priority over our common stock with respect to dividend or liquidation rights. Any future issuance of preferred stock may have the effect of delaying, deferring or preventing a change in our control without further action by our stockholders and may adversely affect the voting and other rights of the holders of our common stock. At present we have no plans to issue any shares of preferred stock or to adopt any new series, preferences or other classification of preferred stock.

The issuance of shares of preferred stock, or the issuance of rights to purchase such shares, could be used to discourage an unsolicited acquisition proposal. For instance, the issuance of a series of preferred stock might impede a business combination by including class voting rights that would enable a holder to block such a transaction. In addition, under certain circumstances, the issuance of preferred stock could adversely affect the voting power of holders of our common stock. Although our Board is required to make any determination to issue preferred stock based on its judgment as to the best interests of our stockholders, our Board could act in a manner that would discourage an acquisition attempt or other transaction that some, or a majority, of our stockholders might believe to be in their best interests or in which such stockholders might receive a premium for their stock over the then market price of such stock. Our Board presently does not intend to seek stockholder approval prior to the issuance of currently authorized stock, unless otherwise required by law or applicable stock exchange rules.

Authorized but Unissued Shares

The authorized but unissued shares of common and preferred stock are available for future issuance without stockholder approval, unless otherwise required by law or applicable stock exchange rules. These additional shares may be used for a variety of corporate purposes, including future public offerings to raise additional capital, corporate

acquisitions and employee benefit plans. The existence of authorized but unissued shares could hinder or discourage an attempt to obtain control of us by means of a proxy contest, tender offer, merger or otherwise.

Warrants

We may issue warrants to purchase our debt or equity securities or other rights, including rights to receive payment in cash or securities based on the value, rate or price of one or more specified commodities, currencies, securities or indices, or any combination of the foregoing. Warrants may be issued independently or together with any other securities and may be attached to, or separate from, such securities. Each series of warrants will be issued under a separate warrant agreement to be entered into between us and a warrant agent. The terms of any warrants to be issued and a description of the material provisions of the applicable warrant agreement will be set forth in the applicable prospectus supplement.

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The applicable prospectus supplement will describe the following terms of any warrants in respect of which this prospectus is being delivered:

- * the title of such warrants;
- * the aggregate number of such warrants;
- * the price or prices at which such warrants will be issued;
- * the currency or currencies, in which the price of such warrants will be payable;
- * the securities or other rights, including rights to receive payment in cash or securities based on the value, rate or price of one or more specified commodities, currencies, securities or indices, or any combination of the foregoing, purchasable upon exercise of such warrants;
- * the price at which and the currency or currencies, in which the securities or other rights purchasable upon exercise of such warrants may be purchased;
- * the date on which the right to exercise such warrants shall commence and the date on which such right shall expire;
- * if applicable, the minimum or maximum amount of such warrants which may be exercised at any one time;
- * if applicable, the designation and terms of the securities with which such warrants are issued and the number of such warrants issued with each such security;
- * if applicable, the date on and after which such warrants and the related securities will be separately transferable;
- * information with respect to book-entry procedures, if any;
- * if applicable, a discussion of any material U.S. federal income tax considerations; and
- * any other material terms of such warrants, including terms, procedures and limitations relating to the exchange and exercise of such warrants.

2005 Stock Option Plan

Our 2005 Stock Option Plan, as amended (the "Option Plan"), currently authorizes the grant of up to 3,700,000 shares of common stock (subject to adjustment for stock splits and similar capital changes) in connection with incentive stock option grants and non-qualified stock option grants. Employees and, in the case of nonqualified stock options, directors, consultants or other service providers are eligible to receive grants under our plans. According to the terms of the Option Plan, no employee may be granted, in any fiscal year, options to purchase more than 100,000 shares. As of December 31, 2011, there were outstanding and unexercised options to purchase 1,445,901 shares under our Option Plan.

2008 Restricted Stock Plan

Our 2008 Restricted Stock Plan, as amended (the "Stock Plan"), currently authorizes the grant of up to 1,550,000 shares of restricted common stock and restricted stock units (subject to adjustment for stock splits and similar capital changes) to employees, directors, consultants or other service providers. According to the terms of the Stock Plan, no individual may be granted, in any fiscal year, more than 200,000 shares. Vesting of shares of restricted stock granted under the Stock Plan may occur over a specified period of time or based upon performance metrics announced at the time of grant. As of December 31, 2011, 1,234,052 restricted stock units had been granted under our Stock Plan, of which 639,759 were vested and released, 353,543 were canceled and 240,750 are currently unvested and outstanding.

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TFG Radiant Option

Pursuant to the Securities Purchase Agreement entered into on August 12, 2011 with TFG Radiant, we granted TFG Radiant an option to purchase 9,500,000 shares of our common stock. This option will only become exercisable under certain terms and conditions, including, among other things, TFG Radiant achieving certain performance milestones related to the construction of an initial PV module manufacturing facility located in Asia. This option will terminate if it becomes exercisable and then it is not exercised on or before February 12, 2014. If a change of control transaction occurs prior to such expiration date, this option will become immediately exercisable and will terminate unless exercised in connection with such change of control transaction. If this option becomes exercisable, the shares would be sold to TFG Radiant at a per share price equal to \$1.55 per share, or an aggregate of \$14,725,000.

Norsk Hydro Registration Rights

In connection with the sale of certain of our securities, Norsk Hydro received piggyback registration rights that enable them to require us to register for resale the shares held by them if we engage in a registered public offering; and also certain demand registration rights.

Anti-Takeover Effects of Certain Provisions of Delaware Law and Our Certificate of Incorporation and Bylaws

Our Certificate of Incorporation and Bylaws contain a number of provisions that could make our acquisition by means of a tender or exchange offer, a proxy contest or otherwise more difficult. These provisions are summarized below.

Removal of Directors. Our Bylaws provide that our directors may only be removed by the affirmative vote of the shares entitled to vote at an election of directors, or for cause by a majority of the Board. Although our Bylaws do not give the Board the power to approve or disapprove stockholder nominations for the election of directors or of any other business stockholders desire to conduct at an annual or any other meeting, the Bylaws may have the effect of precluding a nomination for the election of directors or precluding the conduct of business at a particular annual meeting if the proper procedures are not followed, or discouraging or deterring a third party from conducting a solicitation of proxies to elect its own slate of directors or otherwise attempting to obtain control, even if the conduct of that solicitation or attempt might be beneficial to our stockholders.

Staggered Board. Staggered terms tend to protect against sudden changes in management and may have the effect of delaying, deferring or preventing a change in our control without further action by our stockholders. Our Board is divided into three classes, with one class of directors elected at each year's annual stockholder meeting.

Special Meetings. Our Bylaws provide that special meetings of stockholders can be called by the President, at the request of a majority of the Board or at the written request of holders of at least 50% of the shares outstanding and entitled to vote.

Undesignated Preferred Stock. The ability to authorize undesignated preferred stock makes it possible for our Board of Directors to issue preferred stock with voting or other rights or preferences that could impede the success of any attempt to acquire us. These and other provisions may have the effect of deferring hostile takeovers or delaying changes in control or management of our Company.

Delaware Anti-Takeover Statute. We are subject to the provisions of Section 203 of the Delaware General Corporation Law regulating corporate takeovers. In general, Section 203 prohibits a publicly held Delaware corporation from engaging under certain circumstances in a business combination with an interested stockholder for a period of three years following the date the person became an interested stockholder unless:

Prior to the date of the transaction that resulted in the stockholder becoming an interested stockholder, the board of directors of the corporation approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder.

Upon completion of the transaction that resulted in the stockholder becoming an interested stockholder, the stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the number of shares outstanding (1) shares owned by persons who are directors and also officers and (2) shares owned by employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer.

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On or subsequent to the date of the transaction that resulted in the stockholder becoming an interested stockholder, the business combination is approved by the board and authorized at an annual or special meeting of stockholders, and not by written consent, by the affirmative vote of at least $66\frac{2}{3}\%$ of the outstanding voting stock which is not owned by the interested stockholder.

Generally, a business combination includes a merger, asset or stock sale, or other transaction resulting in a financial benefit to the interested stockholder. An interested stockholder is a person who, together with affiliates and associates, owns or, within three years prior to the determination of interested stockholder status, did own 15% or more of a corporation's outstanding voting securities. We expect the existence of this provision to have an anti-takeover effect with respect to transactions our Board does not approve in advance. We also anticipate that Section 203 may also discourage attempts that might result in a premium over the market price for the shares of common stock held by stockholders.

The provisions of Delaware law, our Certificate of Incorporation and our Bylaws could have the effect of discouraging others from attempting hostile takeovers and, as a consequence, they may also inhibit temporary fluctuations in the market price of our common stock that often result from actual or rumored hostile takeover attempts. These provisions may also have the effect of preventing changes in our management. It is possible that these provisions could make it more difficult to accomplish transactions that stockholders may otherwise deem to be in their best interests.

Listing

Our common stock is listed on the Nasdaq Global Market under the trading symbol "ASTI."

Transfer Agent and Registrar

The transfer agent and registrar of our common stock is Computershare Investor Services.

EXPERTS

The financial statements included in our annual report on Form 10-K for the year ended December 31, 2010 and incorporated into this prospectus by reference have been audited by Hein & Associates LLP, an independent registered public accounting firm, to the extent and for the periods set forth in their report, and are incorporated in this prospectus by reference in reliance upon such report given upon the authority of them as experts in auditing and accounting.

LEGAL MATTERS

The validity of the securities offered hereby will be passed on by Faegre Baker Daniels LLP, Boulder, Colorado.

INFORMATION INCORPORATED BY REFERENCE

This prospectus is part of a registration statement on Form S-3. The SEC allows this filing to "incorporate by reference" information that the Company previously has filed with the SEC. This means the Company can disclose important information to you by referring you to other documents that it has filed with the SEC. The information that is incorporated by reference is considered part of this prospectus, and information that the Company files later will automatically update and may supersede this information. For further information about the Company and the securities being offered, you should refer to the registration statement and the following documents that are incorporated by reference:

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• Our annual report on Form 10-K filed on February 28, 2011, which contains audited financial statements for the fiscal year ended December 31, 2010;

• Our definitive proxy statement on Schedule 14A filed on April 27, 2011;

• Our quarterly reports on Form 10-Q filed on April 28, 2011, August 15, 2011 and November 10, 2011;

- Our current reports on Form 8-K filed on April 6, 2011, June 16, 2011, August 15, 2011, October 13, 2011, October 27, 2011, November 3, 2011, November 22, 2011, January 5, 2012 and February 3, 2012;

• All other reports filed by us pursuant to Section 13(a) or 15(d) of the Exchange Act since the end of the fiscal year covered by the annual report referred to above; and

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The description of our common stock contained in Forms 8-A filed on June 19, 2006 and August 8, 2006 and any amendments or reports filed for the purpose of updating such description.

All documents filed by the Company subsequent to those listed above with the SEC pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act, prior to the termination of the offering, shall be deemed to be incorporated by reference into this prospectus and to be a part hereof from the date of filing of such documents. Any statement contained in a document incorporated by reference herein shall be deemed to be modified or superseded for purposes of this prospectus to the extent that a statement contained herein or in any other subsequently filed document which also is or is deemed to be incorporated by reference herein modifies or supersedes such statement. Any statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this prospectus.

You may request a copy of all documents that are incorporated by reference in this prospectus by writing or telephoning us at the following address and number: Ascent Solar Technologies, Inc., Attention: Corporate Secretary, 12300 North Grant Street, Thornton, Colorado 80241, telephone (720) 872-5000. We will provide copies of all documents requested (not including exhibits to those documents, unless the exhibits are specifically incorporated by reference into those documents or this prospectus) without charge.

WHERE YOU CAN FIND MORE INFORMATION

This prospectus is part of a registration statement on Form S-3 filed with the SEC under the Securities Act. This prospectus does not contain all the information set forth in the registration statement because certain information has been incorporated into the registration statement by reference in accordance with the rules and regulations of the SEC. Please review the documents incorporated by reference for a more complete description of the matters to which such documents relate.

We are subject to the informational reporting requirements of the Exchange Act. In accordance with the Exchange Act, we file reports, proxy statements, and other information with the SEC. You can inspect and copy these reports, proxy statements, and other information at the Public Reference Room of the SEC, 100 F Street, N.E., Washington, D.C. 20549, at prescribed rates. Please call the SEC at 1-800-SEC-0330 for further information on the operation of the public reference rooms. Our SEC filings are also available on the SEC's web site. The address of this site is <http://www.sec.gov>.

INDEMNIFICATION

Our Certificate of Incorporation contains provisions that limit the liability of our directors for monetary damages to the fullest extent permitted by Delaware law. Consequently, our directors will not be personally liable to stockholders for monetary damages for any breach of fiduciary duties as directors, except liability for the following:

- Any breach of their duty of loyalty to our company or our stockholders;
- Acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law;
- Unlawful payments of dividends or unlawful stock repurchases or redemptions as provided in Section 174 of the Delaware General Corporation Law; and
- Any transaction from which the director derived an improper personal benefit.

Our Bylaws provide that we are required to indemnify our directors and officers and may indemnify our employees and other agents to the fullest extent permitted by Delaware law. Our Bylaws also provide that we shall advance expenses incurred by a director or officer before the final disposition of any action or proceeding upon receipt of an undertaking from or on behalf of that director or officer to repay the advance if it is ultimately determined that he or she is not entitled to be indemnified. We have entered and expect to continue to enter into agreements to indemnify our directors, executive officers and other employees as determined by the Board. These agreements provide for indemnification for related expenses including attorneys' fees, judgments, fines and settlement amounts incurred by any of these individuals in any action or proceeding. We believe that these provisions and indemnification agreements are necessary to attract and retain qualified persons as directors and officers. We also maintain directors' and officers' liability insurance.

The limitation of liability and indemnification provisions in our Certificate of Incorporation and Bylaws may discourage stockholders from bringing a lawsuit against our directors for breach of their fiduciary duty. They may also reduce the

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likelihood of derivative litigation against our directors and officers, even though an action, if successful, might benefit us and other stockholders. Furthermore, a stockholder's investment may be adversely affected to the extent that we pay the costs of settlement and damage awards against directors and officers as required by these indemnification provisions. At present, there is no pending litigation or proceeding involving any of our directors, officers or employees regarding which indemnification is sought, and we are not aware of any threatened litigation that may result in claims for indemnification.

DISCLOSURE OF COMMISSION POSITION ON
INDEMNIFICATION OF SECURITIES ACT LIABILITIES

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers or persons controlling us pursuant to the foregoing provisions, we have been informed that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is therefore unenforceable.