

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

FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2018

or

☐ **TRANSITION REPORT UNDER SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the Transition Period from to

Commission File No. 001-32919

Ascent Solar Technologies, Inc.

(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of
incorporation or organization)

20-3672603

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

12300 Grant Street, Thornton, CO

(Address of principal executive offices)

80241

(Zip Code)

Registrant's telephone number including area code: 720-872-5000

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

Title of Each Class

Name of Each Exchange on Which Registered

Common Stock, \$0.0001 par value per share

OTCBB Market

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

None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☐ No ☒

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Exchange Act. Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). ☒ Yes ☐ No

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

Large accelerated filer	<input type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input type="checkbox"/> (Do not check if a smaller reporting company)	Smaller reporting company	<input checked="" type="checkbox"/>
		Emerging growth company	<input type="checkbox"/>

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

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

As of June 30, 2018 , the last business day of the registrant’s most recently completed second fiscal quarter, the aggregate market value of the registrant’s common stock held by non-affiliates was approximately \$3.6 million based upon the last reported sale price of the registrant’s common stock on that date as reported by OTCBB Market, operated by OTC Markets Group Inc.

As of April 11, 2019 , there were 336,754,571 shares of our common stock issued and outstanding.

ASCENT SOLAR TECHNOLOGIES, INC.
Form 10-K Annual Report
for the Fiscal Year ended December 31, 2018
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FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K includes “forward-looking statements” that involve risks and uncertainties. Forward-looking statements include statements concerning our plans, objectives, goals, strategies, future events, future 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 “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and “Business.” When used in this Annual Report, 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 Annual Report.

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 Annual Report in the sections captioned “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations.” Factors you should consider that could cause these differences are:

- Our limited operating history and lack of profitability;
- Our ability to develop demand for, and sales of, 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;
- Our ability to successfully develop and maintain strategic relationships with key partners, including OEMs, system integrators, distributors, retailers and e-commerce companies, who deal directly with end users in our target markets;
- 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 OTCBB Market;
- The commencement, or outcome, of legal proceedings against us, or by us, including ongoing litigation proceedings;
- Changes in our business plan or corporate strategies;
- The extent to which we are able to manage the growth of our operations effectively, both domestically and abroad, whether directly owned or indirectly through licenses;
- The supply, availability and price of equipment, components and raw materials, including the elements needed to produce our photovoltaic modules;
- Our ability to expand and protect the intellectual property portfolio that relates to our consumer electronics, photovoltaic modules and processes;
- Our ability to implement remediation measures to address material weaknesses in internal control;
- General economic and business conditions, and in particular, conditions specific to consumer electronics and the solar power industry; and
- Other risks and uncertainties discussed in greater detail in the section captioned “Risk Factors.”

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.

References to “we,” “us,” “our,” “Ascent,” “Ascent Solar” or the “Company” in this Annual Report mean Ascent Solar Technologies, Inc.

PART I

Item 1. Business

Business Overview

Ascent Solar was formed in October 2005 as a development stage company to commercialize flexible photovoltaic ("PV") modules using our proprietary thin film technology. The 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, high tech plastic substrate using a roll-to-roll manufacturing process followed by laser patterning the layers to create interconnected PV cells, or PV modules, in a process known as monolithic integration. We believe that our unique technology and manufacturing process, which results in a much lighter, flexible yet durable module package, provides us with unique market opportunities 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 the 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 applications such as aerospace, defense, transportation and electronic products, as well as other products and applications that may emerge. For markets that place a high premium on weight, such as defense, space, near space, and aeronautic markets, we believe our materials provide attractive increases in power-to-weight ratio, and that our materials have higher power-to-area ratios and voltage-to-area ratios than competing flexible PV thin film technologies. These metrics will be critical as we position ourselves to compete in challenging high value markets such as aerospace where Ascent Solar products can be integrated into satellites, near earth orbiting vehicles, and fixed-wing unmanned aerial vehicles ("UAV").

Product History

In March 2008, we demonstrated initial operating capacity of our first production line by beginning production trials as an end to end integrated process. Initial operating capacity production trials resulted in average thin film device efficiencies of 9.5% and small area monolithically integrated module efficiencies of over 7.0%. During 2008, optimization trials resulted in thin film device efficiencies in the 9.5% to 11.5% range and corresponding module efficiencies in the 7.0% to 9.0% range. The test modules measured approximately 15 centimeters wide by 30 centimeters long. During the first quarter of 2009, we began limited production of monolithically integrated flexible CIGS modules in our initial production line. Our primary business model, at that time, was based upon mass production of solar modules of varying lengths, sizes and configurations. We provided sample modules to potential customers and development partners in various industries to explore integration of our products into new applications.

In July 2009, we obtained independent verification by the U.S. Department of Energy's National Renewable Energy Laboratory ("NREL") that our modules measured 10.4% in conversion efficiency. The modules tested at NREL were approximately 15 centimeters wide by 30 centimeters long. In October 2009, NREL further verified our achievement of a manufacturing milestone of 14.0% cell efficiency as well as a peak efficiency of 11.4% for CIGS modules. Later, in December 2010, we achieved 12.1% module efficiency on the same form factor. In October 2010, we completed internal qualification testing of a flexible packaging solution which successfully passed the rigorous standard of one thousand (1,000) hours of damp heat testing (85% relative humidity and 85° C temperature) guideline set forth by International Electrotechnical Commission ("IEC") 61646 standards for performance and long term reliability of thin film solar modules.

In February 2010, three of our product configurations were certified by an independent laboratory on a variety of U.S. Department of Defense ("DOD") rugged standards known as MIL-STD-810G. In October 2010, we completed full external certification under IEC 61646 at an independent laboratory of a two meter module. Achieving this certification is required for building integrated photovoltaic ("BIPV") and building applied photovoltaic ("BAPV") applications used in commercial, industrial and residential rooftop markets. Certification activities will continue as required as we introduce new products and make changes or improvements to our already certified products.

In 2010, we received an award from R&D Magazine and were recognized as one of the 100 Most Innovative Technologies based on our process of monolithic integration on polyimide substrate. In 2011, Time Magazine selected us as one of the 50 Best Inventions of the year. In 2015 Ascent Solar won its second R&D 100 Award. The 2015 award was given for the development of the MilPak™ platform, a military-grade (MIL-STD-810G tested) and fully integrated solar power generation and storage unit incorporated with a Maximum Peak Power Tracking (MPPT) management system. The MilPak platform is one of the most rugged, yet lightweight, power generation and storage solutions available, both attributes enabled by the use of Ascent's CIGS technology.

In 2012, we evolved our business model to include B2C, solution based, PV integrated consumer electronics to our off grid high value solar power generation strategy. In June of 2012, we launched our new line of consumer products under the EnerPlex™ brand, and introduced our first product, the Surfr™; a battery and solar case for the Apple® iPhone® 4/4S smart phone featuring our ultra-light CIGS thin film technology integrated directly into the case. The case incorporates our ultra-light and thin PV module into a sleek, protective iPhone 4/4S case, along with a thin, life extending, lithium-polymer battery. The case adds minimal weight and size to an iPhone smartphone, yet provides supplemental charging when needed. In August of 2012, we announced the launch of the second version of the Surfr 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 Kickr IV was an extremely portable, compact and durable solar charging device, approximately seven inches by seven inches when folded, and weighs less than half a pound. The Kickr IV provides 6.5 watts of regulated power that can help charge phones, digital cameras, and other small USB enabled devices. The Kickr IV is ideal for outdoor activities such as camping, hiking and mountain climbing as well as daily city use. To complement the Kickr IV, we also released the Jumpr series of portable power banks in December of 2012. The Jumpr series provides a compact power storage solution for those who need to recharge their portable electronics while on the go.

During 2013, the EnerPlex brand rapidly expanded with the addition of two new product series as well as over fifteen new products. In 2013, we introduced further additions to the Jumpr line of portable power banks; releasing the Jumpr Mini and Jumpr Stack in August and the Jumpr Max in September. The latest additions to the Kickr line of portable solar chargers, the Kickr I and Kickr II, were introduced in August at the Outdoor Retailer show. In October 2013, we released our first series of solar integrated backpacks, the EnerPlex Packr™. The Packr is a functional backpack ideal for charging mobile electronic devices while on the go. Also in October of 2013, we introduced the Surfr battery and solar case for the Samsung Galaxy S® 4, and in December 2013, we introduced the Surfr battery and solar case for Apple's iPhone® 5. To complement our flagship product lines, we added an assortment of accessories, all of which can be integrated into the EnerPlex ecosystem of products; the LED wand, which can be easily plugged into a Jumpr power bank to provide hours of light, or the Travel Adaptor, which enables consumers to charge up their Jumpr power banks from a traditional outlet anywhere in the world.

Beginning in 2013, we aggressively pursued new distribution channels for the EnerPlex brand; these activities led to placement in a variety of high-traffic ecommerce venues such as www.amazon.com, www.walmart.com, www.brookstone.com, www.newegg.com, as well as many others including our own e-commerce platform at www.goenerplex.com. The April 2013 placement of EnerPlex products at Fry's Electronics, a US West Coast consumer electronics retailer, represented the company's first domestic retail presence; EnerPlex products were carried in all of Fry's 34 superstores across 9 states.

Throughout 2014, EnerPlex released multiple additions to the Jumpr line of products: including the Jumpr Stack 3, 6 and 9; innovative batteries equipped with tethered micro-USB and Apple Lightning cables with a revolutionary Stack and Charge design, enabling batteries to be charged simultaneously when they are placed on top of one another. Also released in 2014 were the Jumpr Slate series, products which push the boundaries of how thin batteries can be; the Jumpr Slate 10k, at less than 7mm thick was the thinnest lithium polymer battery available when it was released. The Jumpr Slate 5k and 5k Lightning each come with a tethered micro-USB and Lightning cable respectively; freeing consumers from worrying about toting extra cables with them while on the move.

At Outdoor Retailer 2014, EnerPlex debuted the Generatr Series. The Generatr 1200 and Generatr 100 are lithium-ion based, large format batteries. Lighter and smaller than competitors, the Generatr Series are targeted for consumers who require high-capacity, high-output batteries which remain ultra-portable. Also debuted at Outdoor Retailer was the Commandr 20, a high output solar charger designed specifically to integrate with and charge the Generatr series, allowing consumers to stay out longer without needing to charge their Generatr batteries from a traditional power source. In August 2014, the Kickr II+ and IV+ were also announced, these products represent another evolution in the EnerPlex line of solar products; integrated with a 500mAh battery the Kickr II+ and IV+ are able to provide a constant flow of power even when there are intermittent disruptions in sunlight.

During 2015, we reached an agreement with EVINE Live, one of the premier home shopping networks with TV programming that reaches over 87 million US homes to begin selling EnerPlex products during their broadcasts. EnerPlex launched the Generatr S100 and select other products exclusively with EVINE, EnerPlex also launched the Generatr 1200 launched exclusively with EVINE for a limited period. Also during 2015, EnerPlex expanded its relationship with The Cellular Connection to include over 450 Verizon Wireless Premium Retail Stores; launched its products with two world recognized retailers; The Sports Authority and Cabela's; and launched its products with GovX; the premier online shopping destination for Military, Law Enforcement and Government agencies. Internationally, EnerPlex products became available in the United Kingdom via the brand's launch with 172 Maplin's stores throughout the country.

In 2016, EnerPlex launched the new emergency sales vertical, partnering with Emergency Preparedness eCommerce leader, Emergency Essentials, and we announced new breakthroughs in the Company's line of high-voltage solar products, designed specifically for high-altitude and space markets. Also during the first quarter of 2016, the Company announced the launch of select products on the GSA Advantage website; allowing Federal employees, including members of all branches of the US Military, to directly purchase Ascent and EnerPlex products including: the MilPak E, Commandr 20, Kickr 4 and WaveSol™ solar modules.

In January 2017, Ascent was awarded a contract to supply high-voltage SuperLight thin-film CIGS PV blankets. These 50W, fully laminated, flexible blankets were manufactured using a new process that was optimized for high performance in near-space conditions at elevated temperatures, and are custom designed for easy modular integration into series and parallel configurations to achieve the desired voltage and current required for such application.

In February 2017 Ascent announced the discontinuation of our EnerPlex consumer business by disposing of the EnerPlex brand, and related intellectual properties and trademarks, to our battery product supplier, Sun Pleasure Co. Limited ("SPCL"). This transaction was completed in an effort to better allocate our resources and to continue to focus on our core strength in the high-value specialty PV market. Following the transfer, Ascent will no longer be producing or selling Enerplex-branded consumer products. Ascent will focus on its photovoltaic business and will supply solar PV products to SPCL, supporting the continuous growth of EnerPlex with Ascent's proprietary and award-winning thin-film solar technologies and products.

During the third quarter of 2017, Ascent Solar was selected by Energizer to develop and supply solar panels for their PowerKeep line of solar products, and in November 2017, Ascent introduced the next generation of our USB-based portable power systems with the XD™ series. The first product introduced was the XD-12 which, like previous products, is a folding, lightweight, easily stowable, PV system with USB power regulation. Unique to this generation of PV portable power is more PV power (12 Watts) and a 2.0 Amp smart USB output to enable the XD-12 to charge most smartphones, tablets, and USB-enabled devices as fast as a wall outlet. The enhanced smart USB circuit works with the device to be charged so that the device can determine the maximum power it is able to receive from the XD-12, and ensures the best possible charging performance directly from the sun.

Also in 2017, for a space customer, Ascent manufactured a new micro-module, approximately 12.8mm x 50mm (0.5in x 2.0in) in size that is ideal for both laboratory-scale environmental testing, and for subsequent integration into flight experiments.

In February 2018, the Company introduced the second product in our XD series. Delivering up to 48 Watts of solar power, the durable and compact Ascent XD-48 Solar Charger is the ideal solution for charging many portable electronics and off-grid power systems. The XD-48's versatility allows it to charge both military and consumer electronics directly from the sun wherever needed. Like the XD-12, the XD-48 has a compact and portable design, and its rugged, weather-resistant construction withstands shocks, drops, damage and even minor punctures to power through the harshest conditions.

In March 2018, Ascent successfully shipped to a European based customer for a lighter-than-air, helium-filled airship project based on our newly developed ultra-light modules with substrate material than half of the thickness of our standard modules.

We continue to design and manufacture PV integrated consumer electronics as well as portable power applications for commercial and military users. Due to the high durability enabled by the monolithic integration employed by our technology, the capability to customize modules into different form factors and the industry leading light weight and flexibility provided by our modules, we believe that the potential applications for our products are numerous.

Commercialization and Manufacturing Strategy

We manufacture our products by affixing a thin CIGS layer to a flexible, plastic substrate using a large format, roll-to-roll process that permits us to fabricate our flexible PV modules in an integrated sequential operation. We use proprietary monolithic integration techniques which enable us to form complete PV modules with little to no costly back end assembly of inter cell connections. Traditional PV manufacturers assemble PV modules by bonding or soldering discrete PV cells together. This manufacturing step typically increases manufacturing costs and at times proves detrimental to the overall yield and reliability of the finished product. By reducing or eliminating this added step using our proprietary monolithic integration techniques, we believe we can achieve cost savings in, and increase the reliability of, our PV modules. All tooling necessary for us to meet our near term production requirements is installed in our Thornton, Colorado plant. In 2012, we further revised our strategy to focus on applications for emerging and high-value specialty PV markets, including off grid, aerospace, military and defense and consumer oriented products.

We plan to continue the development of our current PV technology to increase module efficiency, improve our manufacturing tooling and process capabilities and reduce manufacturing costs. We also plan to continue to take advantage of research and development contracts to fund a portion of this development.

Advantages of CIGS on a Flexible Plastic Substrate

Thin film PV solutions differ based on the type of semiconductor material chosen to act as a sunlight absorbing layer, and also on the type of substrate on which the sunlight absorbing layer is affixed. To the best of our knowledge, we believe we are the only company in the world currently focused on commercial scale production of PV modules using CIGS on a flexible, plastic substrate with monolithic integration. We utilize CIGS as a semiconductor material because, at the laboratory level, it has a higher demonstrated cell conversion efficiency than amorphous silicon (“a-Si”) and cadmium telluride (“CdTe”). We also believe CIGS offers other compelling advantages over both a-Si and CdTe, including:

- *CIGS versus a-Si:* Although a-Si, like CIGS, can be deposited on a flexible substrate, its conversion efficiency, which already is generally much lower than that of CIGS, measurably degrades when it is exposed to ultraviolet light, including natural sunlight. To mitigate such degradation, manufacturers of a-Si solar cells are required to implement measures that add cost and complexity to their manufacturing processes.
- *CIGS versus CdTe:* Although CdTe modules have achieved conversion efficiencies that are generally comparable to CIGS in production, we believe CdTe has never been successfully applied to a flexible substrate on a commercial scale. We believe the use of CdTe on a rigid, transparent substrate, such as glass, makes CdTe unsuitable for a number of the applications. We also believe CIGS can achieve higher conversion efficiencies than CdTe in production.

Our choice of substrate material further differentiates us from other thin film PV manufacturers. We believe the use of a flexible, lightweight, insulating substrate that is easier to install provides clear advantages for our target markets, especially where rigid substrates are unsuitable. We also believe our use of a flexible, plastic substrate provides us significant cost advantages because it enables us to employ monolithic integration techniques on larger components, which we believe are unavailable to manufacturers who use flexible, metal substrates. Accordingly, we are able to significantly reduce part count, thereby reducing the need for costly back end assembly of inter cell connections. As the only company, to our knowledge, focused on the commercial production of PV modules using CIGS on a flexible, plastic substrate with monolithic integration, we believe we have the opportunity to address the consumer electronics, defense, aerospace, transportation, off grid, portable power and other weight-sensitive markets with transformational high quality, value added product applications. It is these same unique features and our overall manufacturing process that enables us to produce consumer products that enables our consumer products to be extremely robust, light and flexible.

Competitive Strengths

We believe we possess a number of competitive strengths that provide us with an advantage over our competitors.

- ***We are a pioneer in CIGS technology with a proprietary, flexible, lightweight, high efficiency PV thin film product that positions us to penetrate a wide range of attractive high value added markets such as consumer products, off grid, portable power, transportation, defense, aerial, and other markets.*** By applying CIGS to a flexible plastic substrate, we have developed a PV module that is efficient, lightweight and flexible; with the highest power-to-weight ratio in at-scale commercially available solar. The market for electronic components, such as electronic packages, casings and accessories, as well as defense portable power systems, transportation integrated applications and space and near-space solar power application solutions represent a significant premium market for the company. Relative to our thin film competitors, we believe our advantage in thin film CIGS on plastic technology provides us with a superior product offering for these strategic market segments.
- ***We have the ability to manufacture PV modules for different markets and for customized applications without altering our production processes.*** Our ability to produce PV modules in customized shapes and sizes, or in a variety of shapes and sizes simultaneously, without interrupting production flow, provides us with flexibility in addressing target markets and product applications, and allows us to respond quickly to changing market conditions. Many of our competitors are limited by their technology and/or their manufacturing processes to a more restricted set of product opportunities.
- ***Our integrated, roll-to-roll manufacturing process and proprietary monolithic integration techniques provide us a potential cost advantage over our competitors.*** Historically, manufacturers have formed PV modules by manufacturing individual solar cells and then interconnecting them. Our large format, roll-to-roll manufacturing process allows for integrated continuous production. In addition, our proprietary monolithic integration techniques allow us to utilize laser patterning to create interconnects, thereby creating PV modules at the same time we create PV cells. In so doing, we are able to reduce or eliminate an entire back end processing step, saving time as well as labor and manufacturing costs relative to our competitors.

- ***Our lightweight, powerful, and durable solar panels provide a performance advantage over our competitors.*** For consumer applications where a premium is placed on the weight and profile of the product, our ability to integrate our PV modules into portable packages and cases offers the customer a lightweight and durable solution for all their portable electronics.
- ***Our proven research and development capabilities position us to continue the development of next generation PV modules and technologies.*** Our ability to produce CIGS based PV modules on a flexible plastic substrate is the result of a concerted research and development effort that began more than twenty years ago. We continue to pursue research and development in an effort to drive efficiency improvements in our current PV modules and to work toward next generation technologies and additional applications.
- ***Our manufacturing process can be differentiated into two distinct functions; a front end module manufacturing process and a back end packaging process.*** Our ability to produce finished unpackaged rolls of CIGS material for shipment worldwide to customers for encapsulation and integration into various products enhances our ability to work with partners internationally and domestically.

Markets and Marketing Strategy

In 2012, we modified our strategic focus away from large scale utility projects and rooftop applications to consumer products and high-value specialty solar markets. This new strategy enables us to fully leverage the unique advantages of our technology including flexibility, durability and attractive power to weight and power to area performance. It furthermore enables us to offer unique, differentiated solutions in large markets with less competition, and more attractive pricing. In the second half of 2012, we launched our EnerPlex line of personal power, portable solar solutions and accessories. This represented a significant paradigm shift for us and moved us into the realm of supplying complete consumer product solutions as opposed to strictly commercial solar modules. We also remain focused on specialty solar applications which can fully leverage the unique properties of our award winning CIGS technology. These include aerospace, defense, emergency management and consumer/OEM applications.

In February 2017 Ascent announced the discontinuation of our EnerPlex consumer business by disposing of the EnerPlex brand, and related intellectual properties and trademarks, to our battery product supplier, in an effort to better allocate its resources and to continue to focus on its core strength in the high-value specialty PV market. Ascent is no longer producing or selling Enerplex-branded consumer products and is focusing on its photovoltaic business. Ascent will continue to supply solar PV products for the EnerPlex™ products, thereby supporting their continued growth with Ascent's proprietary and award-winning thin-film solar technologies and products.

Ascent's strategic marketing efforts going forward will be focused on commercializing our proprietary solar technology in three highest-value PV verticals:

- I. Public Sector: Defense and Emergency Management
- II. Aerospace: Space and Fixed Wing UAV
- III. Commercial Off-grid and Portable Power

Each of these strategic verticals include customer segments that place a high value on lightweight, high performance and durable portable power solutions. The value proposition of Ascent's proprietary solar technology not only aligns with the needs of customers in these verticals, but also overcomes many of the obstacles other solar technologies face in these unique markets. Ascent has the capability to design and develop finished products for end users in these areas as well as collaborate with strategic partners to design and develop custom integrated solutions for products like fixed-wing UAVs. Ascent sees significant overlap in the needs of end users across some of these verticals and can achieve economies of scale in sourcing, development, and production in commercializing products for these customers.

The integration of Ascent's solar modules into space, near space, and aeronautic vehicles with ultra-lightweight and flexible solar modules is an important market opportunity for the Company. Customers in this market have historically required a high level of durability, high voltage and conversion efficiency from solar module suppliers, and we believe our products are well suited to compete in this premium market. In May 2014, together with our partners, Silent Falcon UAS Technologies and Bye Aerospace, we announced the successful first flight of a production version of the Silent Falcon™ Unmanned Aircraft Systems, powered by Ascent's ultra-lightweight, flexible PV modules. In July 2014, our ultra-lightweight, flexible PV modules were selected by Vanguard Space Technologies for their NASA Small Business Innovative Research program. The NASA program is intended to develop an economical, lightweight alternative to existing and emerging high-cost solar arrays for high-power space applications. We expect opportunities in this segment to develop rapidly due to customers' extensive development, testing and evaluation processes.

In March 2016, the Company announced a major breakthrough of our high-voltage superlight modules, achieving a power-to-weight ratio of 1,700 watts per kilogram at AM0 environment. In December 2016, Ascent was selected by the Japan Aerospace Exploration Agency ("JAXA") as part of their next round of evaluations for providing solar technology for an upcoming mission to Jupiter, as well as to address additional missions. This decision followed an earlier round of investigation with promising results, during which the Company's flexible, monolithically integrated CIGS solar module was subjected to environmental extremes, and continued to operate well. During the first phase of JAXA's evaluation, Ascent's PV was successfully tested below -146°C (-231°F) and up to +190°C (+374°F), and to only 4% of the sunlight generally received in earth's orbit. In addition, JAXA has subjected Ascent's PV to radiation and mechanical testing.

In 2017 we continued to solidify our position in the space and near-space markets; these challenging requirements and environments allow for the full utilization of the unique nature and advantages of our lightweight, flexible monolithically-integrated CIGS PV. Through continued work in the PV-powered drone field, Ascent made significant strides in providing PV power to high-altitude airships and next-generation space applications.

In January 2017, Ascent was awarded a contract to supply high-voltage SuperLight thin-film CIGS PV blankets. These 50W, fully laminated, flexible blankets were manufactured using a new process that was optimized for high performance in near-space conditions at elevated temperatures, and are custom designed for easy modular integration into series and parallel configurations to achieve the desired voltage and current required for such application.

In November 2017, Ascent fulfilled a third order from JAXA for custom PV products designed specifically for their upcoming solar sail deployment demonstration project. This project was comprised of small area test cells and large, 19.5cm x 30cm monolithically-integrated modules, all on a very thin, 25-micron (0.001 inch) plastic substrate which is half the thickness of Ascent's production substrate for a standard product. In space, near-space, and drone applications, the PV substrate accounts for a significant portion of the product's overall mass; the PV construction on the new 25-micron substrates represents a major breakthrough for these markets. JAXA placed this order after achieving the desired experimental results from the previous shipments and subsequent electrical, mechanical and environmental testing. The 19.5cm x 30cm module is a custom design to match the anticipated deployment mechanism and PV layout for the final Jovian spacecraft.

Also in 2017, Ascent fulfilled a new order, with another repeat space customer, to manufacture a new micro-module, approximately 12.8mm x 50mm (0.5in x 2.0in) in size that is ideal for both laboratory-scale environmental testing, and for subsequent integration into flight experiments.

In 2015 Ascent Solar won its second R&D 100 Award, the 2015 award was given for the development of the MilPak platform, a military-grade solar power generation and storage unit. The MilPak platform is one of the most rugged, yet lightweight, power generation and storage solutions available, both attributes enabled by the use of Ascent's CIGS technology.

The military market has a unique set of requirements we believe are well suited to our products. When integrated with fabric to form re-deployable arrays, our highly efficient, rugged, lightweight modules may allow soldiers to minimize battery loads, reduce the use of conventional fuels, and increase safety through the streamlining of fuel transport operations, providing the front-line units with maximum resilience and helping to increase operational efficiency. We are also working to expand our foldable line of outdoor solar chargers, such as the XD-12 and the XD-48, which are well suited for the individual soldier or for the bigger power needs of a platoon with the ability of several chargers to be strung together. Our modules can also provide a reliable source of renewable power in remote areas, regardless of local infrastructure. We will continue to reach the military market through partnerships with top systems providers, by providing Government Service Administration Letters of Supply, and through direct sales and other blanket purchase agreements with the government.

Transportation integrated PV, or integration of our flexible solar modules with vehicles such as commercial trucks, buses, trains and passenger cars, is another market segment that represents a significant opportunity. Due to their flexible form and durable, lightweight properties, our modules can be fitted to the exterior of various vehicles to provide supplemental power without significantly affecting the aerodynamics, weight or aesthetics of the vehicle. We are currently working with multiple integrators and OEMs to develop effective value added solutions for this market.

During the third quarter of 2017, Ascent Solar demonstrated its breadth of capabilities at the US Special Operations Command ("SOCOM") exclusive Technical Experimentation ("TE") 17-3 Event in Washington, DC. SOCOM is tasked, by the Department of Defense ("DoD"), with providing Special Operations Forces ("SOF") with the latest war fighting technology available; in support of this effort, SOCOM sponsors an annual TE event. In July of 2017 SOCOM requested the participation of companies who have proficiency in the areas of Satellite Communication ("SATCOM") and Unattended Ground Sensors ("UGS") for a TE event. Over 30 companies were selected to participate, and Ascent Solar was one of only 2 companies selected to participate who didn't actually make SATCOM or UGS products. Ascent Solar was selected on the basis and recognition that one of the primary issues facing the DoD today is the ability to power all of their war fighting technology. Ascent's diverse line-up of rugged and lightweight portable solar products offers the potential for the DoD to generate unattended ongoing power, which could save lives and increase the efficiency of the war fighting effort. Ascent was honored to be chosen to participate, and the assessed score we received is indicative of a capability that has "high potential for SOF use with few limitations".

During the third quarter of 2018, Ascent Solar was once again selected to demonstrate its breadth of capabilities at the SOCOM exclusive TE 18-3 Event in Washington, DC. In July of 2018, SOCOM requested the participation of companies who have proficiency in the areas of Intelligence, Surveillance and Reconnaissance (ISR), Small Unmanned Aerial Systems (SUAS) and Mobility for the TE event. Over 50 companies were selected to participate, and Ascent Solar was one of only 2 companies selected for a second straight year.

We continue to supply our strategic partners with PV modules to support their development, testing and certification of new integrated PV products, including product testing by several branches of the U.S. military. We believe that our high power density flexible solar modules enable new applications for solar power. By creating mutually beneficial partnerships and strategically penetrating the markets discussed above, we plan to transform the landscape of solar power generation with truly innovative end products.

Competition

We have shifted our strategic focus away from large scale utility projects of the traditional solar markets. We believe our thin film, monolithically integrated CIGS technology enables us to deliver sleek, lightweight, rugged, high performance solutions to serve these markets as competitors from other thin film and c-Si companies emerge. The landscape of thin film manufacturers encompasses a broad mix of technology platforms at various stages of development, and consists of a number of medium and small companies.

The market for traditional, grid connected PV products is dominated by large manufacturers of c-Si technology, although thin film technology on glass has begun to emerge among the major players. We anticipate that while these large manufacturers may continue to dominate the market with their silicon based products, thin film manufacturers will likely capture an increasingly larger share of the market, as is evident from the success of First Solar (CdTe) and Solar Frontier (CIGS), both among the top 20 producers worldwide. In 2016, crystalline silicon PV technology represented over 90% of global market revenue and 93% of global production, with the balance captured by thin film. Approximately half of thin film production is CdTe production, with the other half being split between CIGS and a-Si.

We believe that our modules offer unique advantages. Their flexibility, low areal density (mass per unit area), and high specific power (power per unit mass) enable use on weight-sensitive applications, such as portable power, conformal aircraft surfaces, high altitude long endurance (HALE) fixed wing and lighter than air (LTA) vehicles, and space applications that are unsuitable for glass-based modules. Innovative product design, customer focused development, and our rapid prototyping capability yield modules that could be integrated into virtually any product to create a source of renewable energy. Whether compared to glass based or other flexible modules, our products offer competitive advantages making them unique in comparison to competing products.

We define the consumer and portable power space as comprising solar powered solutions in the sub-single watt range (i.e. solar power for remote sensors) all the way up to the several hundred watts of power range (i.e. outdoor solar chargers for camping, military or outdoor work). Competitors in the consumer products space include companies that design and distribute solar charging solutions but outsource manufacturing. These include Goal Zero, Voltaic, A-Solar, Solio, PowerTraveller, Solar Components, and RDK Products. Mono or polycrystalline silicon solar technologies are common in these products. Other competitors in this segment include thin-film solar manufacturers who provide a complete product under their company name or brand. These companies include P3 solar, PowerFilm, Trony, and more recently Alta Devices. We believe our differentiated technology lends itself to delivering competitive solutions in the emerging market for personal and portable solar and non-solar charging solutions.

Research and Development and Intellectual Property

We intend to continue to invest in research and development in order to provide near term improvements to our manufacturing process and products, as well as to identify next generation technologies relevant to both our existing and potential new markets. During 2018 and 2017 we incurred approximately \$2.8 million and \$4.8 million, respectively, in research and development costs, which include research and development incurred in relation to our government contracts, as well as manufacturing costs incurred while developing our product lines and manufacturing process.

Our technology was initially developed at ITN beginning in 1994. In early 2006, ITN assigned to us certain CIGS PV-specific technologies, and granted to us a perpetual, exclusive, royalty free, worldwide license to use these technologies in connection with the manufacture, development, marketing and commercialization of CIGS PV to produce solar power. In addition, certain of ITN's existing and future proprietary process and control technologies, although nonspecific to CIGS PV, were assigned to us. ITN retained the right to conduct research and development activities in connection with PV materials, and we agreed to grant a license back to ITN for improvements to the licensed technologies and intellectual property outside of the CIGS PV field.

We protect our intellectual property through a combination of trade secrets and patent protections. We own the following patents and published patent applications:

Issued Patents and Registrations

1. US Patent No. 7,271,333 entitled "Apparatus and Method of Production of Thin-Film Photovoltaic Modules" (issued September 18, 2007)
2. US Patent No. 7,812,247 entitled "Flexible Photovoltaic Array With Integrated Wiring And Control Circuitry, And Associated Methods" (issued October 12, 2010; (co-owned with PermaCity Corporation)
3. US Patent No. 8,021,905 entitled "Machine and Process for Sequential Multi-Sublayer Deposition of Copper Indium Gallium Diselenide Compound Semiconductors" (issued September 20, 2011)
4. US Patent No. 8,124,870 entitled "Systems and Processes for Bifacial Collection and Tandem Junctions Using a Thin film Photovoltaic Device" (issued February 28, 2012)
5. US Patent No. 8,207,442 entitled "Reinforcing Structures for Thin film Photovoltaic Device Substrates, and Associated Methods" (issued June 26, 2012)
6. US Patent No. 8,426,725 entitled "Apparatus and Method for Hybrid Photovoltaic Device Having Multiple, Stacked, Heterogeneous, Semiconductor Junctions" (issued April 23, 2013)
7. US Patent No. 8,465,589 entitled "Machine and Process for Sequential Multi-Sublayer Deposition of Copper Indium Gallium Diselenide Compound Semiconductors" (issued June 18, 2013)
8. US Patent No. D697,502 entitled "Mobile Electronic Device Case" (issued January 14, 2014)
9. US Patent No. 8,648,253 entitled "Machine and Process for Continuous, Sequential, Deposition of Semiconductor Solar Absorbers Having Variable Semiconductor Composition Deposited in Multiple Sublayers" (issued February 11, 2014)
10. US Patent No. 8,716,591 entitled "Array of Monolithically Integrated Thin Film PhotoVoltaic Cells and Associated Methods" (issued May 6, 2014)
11. ECD No. 001429773-0001 entitled "Mobile Handheld Electronic Device Case" (issued February 6, 2015)
12. ECD No. 001429773-0002 entitled "Mobile Handheld Electronic Device Case" (issued February 6, 2015)
13. ECD No. 001429773-0003 entitled "Mobile Handheld Electronic Device Case" (issued February 6, 2015)
14. ECD No. 001429773-0004 entitled "Mobile Handheld Electronic Device Case" (issued February 6, 2015)
15. ECD No. 001429773-0005 entitled "Mobile Handheld Electronic Device Case" (issued February 6, 2015)
16. ECD No. 001429773-0006 entitled "Mobile Handheld Electronic Device Case" (issued February 6, 2015)
17. ECD No. 001429773-0007 entitled "Mobile Handheld Electronic Device Case" (issued February 6, 2015)

18. ECD No. 002732123-0001 entitled “Portable Battery Charging Device” (issued July 7, 2015)
19. ECD No. 002732123-0002 entitled “Portable Battery Charging Device” (issued July 7, 2015)
20. ECD No. 002732123-0003 entitled “Portable Battery Charging Device” (issued July 7, 2015)
21. ECD No. 002735159-0001 entitled “Portable Energy Storage And Distribution Device” (issued July 10, 2015)
22. ECD No. 002735159-0002 entitled “Portable Energy Storage And Distribution Device” (issued July 10, 2015)
23. ECD No. 002735159-0003 entitled “Portable Energy Storage And Distribution Device” (issued July 10, 2015)
24. ECD No. 002735159-0004 entitled “Portable Energy Storage And Distribution Device” (issued July 10, 2015)
25. US Patent 9,147,783 entitled “Apparatus and Method for Hybrid Photovoltaic Device Having Multiple, Stacked, Heterogeneous, Semiconductor Junctions” (issued September 29, 2015)
26. KR Patent No. 30. 0860220 entitled “Apparatus and Method for Hybrid Photovoltaic Device Having Multiple, Stacked, Heterogeneous, Semiconductor Junctions” (issued October 13, 2015)
27. KR Patent 10-1561453 entitled “Apparatus and Method for Hybrid Photovoltaic Device Having Multiple, Stacked, Heterogeneous, Semiconductor Junctions” (issued October 13, 2015)
28. US Patent No. 9,209,322 entitled “Multilayer Thin-Film Back Contact System For Flexible Photovoltaic Devices On Polymer Substrates” (issued December 8, 2015)
29. US Patent No. 9,219,179 entitled “Multilayer Thin-Film Back Contact System For Flexible Photovoltaic Devices On Polymer Substrates” (issued December 22, 2015)
30. CN Patent No. ZL 201530237203.8 entitled “Photovoltaic-Based Fully Integrated Portable Power System” (issued February 10, 2016)
31. TW Patent No. I526630 entitled “Subtractive Hinge and Associated Methods” (issued March 21, 2016)
32. US Patent No. 9,349,905 entitled “Hybrid Multi-Junction Photovoltaic Cells And Associated Methods” (issued May 24, 2016)
33. TW Patent No. I536592 entitled “Photovoltaic Assembly and Associated Methods” (issued June 1, 2016)
34. KR Patent No. 30-0860220 entitled “Photovoltaic-Based Fully Integrated Portable Equipment For Control of Electric Power” (issued June 16, 2016)
35. CN Patent No. ZL 201180067131.6 entitled “Apparatus and Method for Hybrid Photovoltaic Device Having Multiple, Stacked, Heterogeneous, Semiconductor Junctions” (issued August 10, 2016)
36. CN Patent No. ZL201380012566.X entitled “Subtractive Hinge And Associated Methods” (issued August 24, 2016)
37. US Patent No. 9538671 entitled System For Housing And Powering A Battery-Operated Device And Associated Methods (issued January 3, 2017)
38. US Patent No. D781,228 entitled Pocket-Sized Photovoltaic-Based Fully Integrated Portable Power System (issued March 14, 2017)
39. US Patent No. 9601650 entitled Machine And Process For Continuous, Sequential, Deposition Of Semiconductor Solar Absorbers Having Variable Semiconductor Composition Deposited In Multiple Sublayers (issued March 21, 2017)
40. US Patent No. 9634175 entitled Systems And Methods For Thermally Managing High-Temperature Processes On Temperature Sensitive Substrates (issued April 25, 2017)
41. US Patent No. 9640706 entitled Hybrid Multi-Junction Photovoltaic Cells And Associated Methods (issued May 2, 2017)
42. US Patent No. 9640692 entitled Flexible Photovoltaic Array with Integrated Wiring and Control Circuitry, and Associated Methods (issued May 2, 2017)
43. US Patent No. 9653635 entitled Flexible High-Voltage Adaptable Current Photovoltaic Modules and Associated Methods (issued May 16, 2017)
44. Taiwan Patent No. I583810 entitled Systems And Methods For Thermally Managing High-Temperature Processes On Temperature Sensitive Substrates (issued May 21, 2017)
45. Switzerland Patent No. 2742535 entitled Multilayer Thin-Film Back Contact System for Flexible Photovoltaic Devices on Polymer Substrates (issued July 26, 2017)
46. EPC Patent No. 2742535 entitled Multilayer Thin-Film Back Contact System for Flexible Photovoltaic Devices on Polymer Substrates (issued July 26, 2017)
47. France Patent No. 2742535 entitled Multilayer Thin-Film Back Contact System for Flexible Photovoltaic Devices on Polymer Substrates (issued July 26, 2017)
48. Great Britain Patent No. 2742535 entitled Multilayer Thin-Film Back Contact System for Flexible Photovoltaic Devices on Polymer Substrates (issued July 26, 2017)

49. Germany Patent No. 602012035034.2 entitled Multilayer Thin-Film Back Contact System for Flexible Photovoltaic Devices on Polymer Substrates (issued July 26, 2017)
50. Taiwan Patent No. I595674 entitled Multilayer Thin-Film Back Contact System for Flexible Photovoltaic Devices on Polymer Substrates (issued August 11, 2017)
51. US Patent No. 9780242 entitled “Multilayer Thin-Film Back Contact System for Flexible Photovoltaic Devices on Polymer Substrates” (issued October 3, 2017)

Published Patent Applications

1. "Flexible Photovoltaic Array with Integrated Wiring and Control Circuitry, and Associated Methods" (US 12/901,963) (filed October 11, 2010) (co-owned with PermaCity Corporation)
2. “Cd-Free, Oxide Buffer Layers for Thin Film CIGS Solar Cells By Chemical Solution Deposition Methods” (US 13/227,935) (filed September 8, 2011)
3. “Systems and Processes for Bifacial Collection and Tandem Junctions Using a Thin film Photovoltaic Device” (US 13/406,376) (filed February 27, 2012)
4. “Multilayer Thin Film Back Contact System for Flexible Photovoltaic Devices on Polymer Substrates” (US 13/572,387) (filed August 10, 2012)
5. “Multilayer Thin Film Back Contact System for Flexible Photovoltaic Devices on Polymer Substrates” (PCT/US2012/050398) (filed August 10, 2012)
6. “Multilayer Thin Film Back Contact System for Flexible Photovoltaic Devices on Polymer Substrates” (CN 201280047345.1) (filed August 10, 2012)
7. “Apparatus and Method for Hybrid Photovoltaic Device Having Multiple, Stacked, Heterogeneous, Semiconductor Junctions” (EP 11804861.0) (filed December 13, 2011)
8. “Apparatus and Method for Hybrid Photovoltaic Device Having Multiple, Stacked, Heterogeneous, Semiconductor Junctions” (CN 201180067131.6) (filed December 13, 2011)
9. “Subtractive Hinge and Associated Methods (US 13/783,336) (filed March 3, 2013)
10. “Subtractive Hinge and Associated Methods (PCT/US 2013/28,929) (filed March 4, 2013)
11. “Subtractive Hinge and Associated Methods (CN 201380012566.X) (filed March 4, 2013)
12. “Subtractive Hinge and Associated Methods (EP 13758462.9) (filed March 4, 2013)
13. “System For Housing And Powering A Battery-Operated Device And Associated Methods” (US 13/802,713) (filed March 14, 2013)
14. “System For Housing And Powering A Battery-Operated Device And Associated Methods” (US 13/802,719) (filed March 14, 2013)
15. “System For Housing And Powering A Battery-Operated Device And Associated Methods” (PCT/US2013/34988) (filed April 2, 2013)
16. “Photovoltaic Assembly and Associated Methods” (US 14/038096) (filed September 26, 2013)
17. “Photovoltaic Assembly and Associated Methods” (PCT/US2013/62355) (filed September 27, 2013)
18. “Photovoltaic Assembly and Associated Methods” (CN 201380060351.5) (filed September 27, 2013)
19. “Photovoltaic Assembly and Associated Methods” (EP 13840976.8) (filed September 27, 2013)
20. “Flexible High-Voltage Adaptable Current Photovoltaic Modules and Associated Methods” (US 14/041,886) (filed September 30, 2013)
21. “Hybrid Multi-Junction Photovoltaic Cells And Associated Methods” (US 14/100,960) (filed December 9, 2013)
22. “System For Housing And Powering A Battery-Operated Device And Associated Methods” (PCT/US2013/74936) (filed December 13, 2013)
23. “Systems And Methods For Thermally Managing High-Temperature Processes On Temperature Sensitive Substrates” (US 14/150,376) (filed January 8, 2014)
24. “Systems And Methods For Thermally Managing High-Temperature Processes On Temperature Sensitive Substrates” (PCT/US2014/10867) (filed January 8, 2014)
25. “Systems And Methods For Thermally Managing High-Temperature Processes On Temperature Sensitive Substrates” (CN 201480004408.4) (filed January 8, 2014)

26. “Systems And Methods For Thermally Managing High-Temperature Processes On Temperature Sensitive Substrates” (EP 14738271.7) (filed January 8, 2014)
27. “Multilayer Thin-Film Back Contact System For Flexible Photovoltaic Devices On Polymer Substrates” (PCT/US15/20184) (filed March 12, 2015)
28. “Array Of Monolithically Integrated Thin Film Photovoltaic Cells And Associated Methods” (14/252,485) (filed April 14, 2014)
29. “Subtractive Hinge And Associated Methods” (EP 13758462.9) (filed March 4, 2013)
30. “Photovoltaic Assembly and Associated Methods” (EP 13840976.8) (filed September 27, 2013)
31. “Systems And Methods For Thermally Managing High-Temperature Processes On Temperature Sensitive Substrates” (CN 201480004408.4) (filed January 9, 2014)
32. “Systems And Methods For Thermally Managing High-Temperature Processes On Temperature Sensitive Substrates” (EP 14738271.7) (filed January 9, 2014)
33. “Multilayer Thin-Film Back Contact System For Flexible Photovoltaic Devices On Polymer Substrates” (US 14/932,933) (filed November 4, 2015)
34. “Photovoltaic-Based Fully Integrated Portable Power Systems” (PCT/US16/12047) (filed January 4, 2016)
35. “Photovoltaic-Based Fully Integrated Portable Power System” (US 14/987,214) (filed January 4, 2016)
36. “Systems and Processes for Bifacial Collection and Tandem Junctions Using a Thin-Film Photovoltaic Device” (US 15/099,835) (filed April 15, 2016)
37. “Photovoltaic-Based Fully Integrated Portable Power Management And Networking System” (PCT/US16/25647) (filed April 1, 2016)
38. “Photovoltaic-Based Fully Integrated Portable Power Management And Networking System” (US 15/089,028) (filed April 1, 2016)
39. “Photovoltaic Device and Method of Manufacturing Same” (CN 201610416638.2) (filed December 13, 2011)
40. “Multilayer Thin-Film Back Contact System For Flexible Photovoltaic Devices On Polymer Substrates” (US 15/258,169) (filed September 7, 2016)
41. “Hybrid Multi-Junction Photovoltaic Cells And Associated Methods” (US 15/137,696) (filed April 25, 2016)
42. “Machine And Process For Continuous, Sequential, Deposition Of Semiconductor Solar Absorbers Having Variable Semiconductor Composition Deposited In Multiple Sublayers” (US 15/584,241) (filed May 2, 2017)
43. “Multilayer Thin-Film Back Contact System for Flexible Photovoltaic Devices on Polymer Substrates” (GB 12759843.1) (Filed August 10, 2012)
44. “Multilayer Thin-Film Back Contact System for Flexible Photovoltaic Devices on Polymer Substrates” (WO PCT/US16/58933) (Filed October 26, 2016)
45. “Subtractive Hinge and Associated Methods” (US 15/673,283) (Filed August 9, 2017)

Ascent Solar has trademark applications and registrations in the United States and worldwide for slogans and product family names such as WaveSol, MilPak, and Transforming Everyday Life.

Depending on country laws, the marks listed above may include the ™ or ® symbols.

Suppliers

We rely on several unaffiliated companies to supply certain raw materials used during the fabrication of our PV modules and PV integrated electronics. We acquire these materials on a purchase order basis and do not have long term purchase quantity commitments with the suppliers, although we may enter into such contracts in the future. We currently acquire all of our high temperature plastic from one supplier, although alternative suppliers of similar materials exist. We purchase component molybdenum, copper, indium, gallium, selenium and indium tin oxides from a variety of suppliers. We also currently are in the process of identifying and negotiating arrangements with alternative suppliers of materials in the United States and Asia.

The manufacturing equipment and tools used in our production process have been purchased from various suppliers in Europe, the United States and Asia. Although we have had good relations with our existing equipment and tools suppliers, we monitor and explore opportunities for developing alternative sources to drive our manufacturing costs down.

Employees

As of December 31, 2018, we had 22 full time employees.

Company History

We were formed in October 2005 from the separation by ITN of its Advanced Photovoltaic Division and all of that division's key personnel and core technologies. ITN, a private company incorporated in 1994, is an incubator dedicated to the development of thin film, PV, battery, fuel cell and nanotechnologies. Through its work on research and development contracts for private and government entities, ITN developed proprietary processing and manufacturing know-how applicable to PV products generally, and to CIGS PV products in particular. Our company was established by ITN to commercialize its investment in CIGS PV technologies. In January 2006, ITN assigned to us all its CIGS PV technologies and trade secrets and granted to us a perpetual, exclusive, royalty free worldwide license to use certain of ITN's proprietary process, control and design technologies in the production of CIGS PV modules. Upon receipt of the necessary government approvals in January 2007, ITN assigned government funded research and development contracts to us and also transferred the key personnel working on the contracts to us.

Corporate Information

We were incorporated under the laws of Delaware in October 2005. 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, and should not be considered, part of this Annual Report.

Available Information

We file with the Securities and Exchange Commission ("SEC") our annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and all amendments to those reports, proxy statements and registration statements. You may read and copy any material we file with the SEC at the SEC's Public Reference Room at 100 F Street, NE, Washington, D.C. 20549. You may also obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. In addition, the SEC maintains an internet site at <http://www.sec.gov> that contains reports, proxy and information statements, and other information regarding issuers, including us, that file electronically. We make available free of charge on, or through, our website at www.ascentsolar.com our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to these reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended ("Exchange Act") as soon as reasonably practicable after we file these materials with the SEC.

Item 1A. Risk Factors

The risks included here are not exhaustive or exclusive. Other sections of this Annual Report may include additional factors which could adversely affect our business, results of operations and financial performance. We operate in a very competitive and rapidly changing environment. New risk factors emerge from time to time, and it is not possible for management to predict all such risk factors, nor can it assess the impact of all such risk factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements. Given these risks and uncertainties, investors should not place undue reliance on forward-looking statements as a prediction of actual results.

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 products. We have a limited operating history and have generated limited revenue from operations. Currently we are producing 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. We are utilizing 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;
- 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 successfully design, manufacture, market, distribute and sell our 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, retailers and e-commerce companies, who deal directly with end users in our target markets;
- Our ability to maintain the listing of our common stock on the OTCBB 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
- The 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 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. We incurred a net loss of \$16 million for the year ended December 31, 2018 and reported an accumulated deficit of \$419 million as of December 31, 2018 . 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 specialty PV products at competitive prices. If we are unable to raise additional capital and generate sufficient revenue to achieve profitability and positive cash flows, we may be unable to satisfy our commitments and may have to discontinue operations.

Our business is based on a new 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 relatively new technology. 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 us to 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 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 facility. Successful operations will require substantial engineering and manufacturing resources and are subject to significant risks, including risks of cost overruns, delays and other risks, such as geopolitical unrest that may cause us not to be able to successfully operate in other countries. 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 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 products 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 require additional capital which we may not be able to obtain on favorable terms, if at all or without dilution to our stockholders. Since inception, we have incurred significant losses. We expect to continue to incur net losses in the near term. For the year ended December 31, 2018, our cash used in operations was \$4.0 million. At December 31, 2018, we had cash and equivalents of approximately \$18,000.

Although we have commenced production at our manufacturing facility, we do not expect that sales revenue and cash flows will be sufficient to support operations and cash requirements until we have fully implemented our new strategy of focusing on high value PV products. Additional projected product revenues are not anticipated to result in a positive cash flow position for the year 2019 overall. The Company will need to raise additional capital in order to continue our current level of operations throughout 2019.

To the extent that we may need to raise additional capital in the future there is no assurance that we will be able to raise additional capital on acceptable terms or at all. 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. 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 such as working capital financing); merge or consolidate with any other entity; or make loans or advances to our officers, shareholders, directors or employees. The presence of these 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.

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 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 portable power, defense, transportation, space and near space markets. Although certain areas of these markets have started to develop, some of them 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 defense and portable power, transportation, space and near space, 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 portable power systems, defense and portable power systems, transportation, space and near space solar panel applications. Our marketing and distribution strategy is to form strategic relationships with distributors, value added resellers and e-commerce 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. While pure PV solutions is not our short term primary market, if PV technology proves unsuitable for widespread adoption or if demand for PV modules fails to develop sufficiently, long term we may be unable to grow our business, generate sufficient sales to attain profitability or continue operations. Many factors, of which several 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 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. If our products fail to perform as expected while under warranty, or if we are unable to support the warranties, sales of our products may be adversely affected or our costs may increase, and our business, results of operations and financial condition could be materially and adversely affected.

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

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 materially 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 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 these agreements will provide meaningful protection of our trade secrets, unauthorized use, misappropriation or disclosure of trade secrets, know how or other proprietary information. Despite our efforts to protect this information, unauthorized parties may 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 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 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 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 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 the scope of the intellectual property we have licensed is too narrow to cover our activities, or in the event the licensor did not have sufficient rights to grant us the license(s) purportedly granted. Also, some of our licenses may restrict or limit our ability to grant sub-licenses 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. 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 noncompliance 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 products.

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 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.

We have identified material weaknesses in our internal control over financial reporting. If our remedial measures are insufficient to address the material weaknesses, or if additional material weaknesses or significant deficiencies in our internal control over financial reporting are discovered or occur in the future, our consolidated financial statements may contain material misstatements, which could adversely affect our stock price and could negatively impact our results of operations. At December 31, 2018, we concluded that there were material weaknesses in our internal control over financial reporting. A material weakness is a deficiency, or combination of deficiencies, in internal control over financial reporting such that there is a reasonable possibility that a material misstatement of our annual or interim financial statements will not be prevented or detected on a timely basis. See Item 9A in Part II of this Annual Report on Form 10-K for details.

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 OTCBB. 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 we will be able to comply with all of these requirements or 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 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 OTCBB 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 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 OTCBB 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, during the calendar year ended December 31, 2018, our common stock traded below \$0.01. 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.

Our stockholders may experience significant dilution as a result of shares of our common stock issued pursuant to our currently outstanding securities and existing agreements, and pursuant to new securities that we may issue in the future. We are likely to issue substantial amounts of additional common stock in connection with most of our outstanding convertible preferred stock and convertible notes. We may also issue additional common stock or securities convertible into or exchangeable or exercisable for common stock, in connection with future capital raising transactions.

Most of our outstanding convertible preferred stock and convertible notes contain variable pricing mechanisms. The number of shares that we will issue pursuant to the aforementioned financial instruments will fluctuate based on the price of our common stock. Depending on market liquidity at the time, sales of such shares into the market may cause the trading price of our common stock to fall.

The issuance of material amounts of common stock by us would cause our existing stockholders to experience significant dilution in their investment in our Company. Also, if we obtain additional financing involving the issuance of equity securities or securities convertible into equity securities, our existing stockholders’ investment would be further diluted. Such dilution could cause the market price of our common stock to decline, which could impair our ability to raise additional financing.

Sales of a significant number of shares of our common stock in the public markets or significant short sales of our stock, or the perception that such sales could occur, could depress the market price of our common stock and impair our ability to raise capital. Sales of a substantial number of shares of our common stock or other equity-related securities in the public markets could depress the market price of our common stock. If there are significant short sales of our stock, the price decline that could result from this activity may cause the share price to decline more so, which, in turn, may cause long holders of the stock to sell their shares, thereby contributing to sales of stock in the market. Such sales also may impair our ability to raise capital through the sale of additional equity securities in the future at a time and price that our management deems acceptable, if at all. In addition, a large number of our outstanding shares are not registered under the Securities Act. If and when these shares are registered or become eligible for sale to the public market, the market price of our common stock could also decline.

Our common stock has been delisted from the NASDAQ Capital Market and the OTCQB Venture Market. Our inability to maintain our prior listings on NASDAQ and OTCQB may limit the liquidity of our stock, increase its volatility and hinder our ability to raise capital. On February 25, 2016, our common stock was delisted from the NASDAQ Capital Market and began trading on the OTCQB Venture Market. On May 20, 2017 our common stock was delisted from the OTCQB Venture Market and began trading on the OTCBB.

Upon such delisting from NASDAQ, our common stock became 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. Accordingly, investors in our common stock 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 continue to be eligible for trading or quotation on the OTCBB or any other alternative exchanges or markets.

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

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 Amended and Restated Certificate of Incorporation and Second Amended and Restated Bylaws, each as amended, 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:

- 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.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

We own an approximately 138,000 square foot manufacturing and office facility in Thornton, Colorado.

Item 3. Legal Proceedings

None.

Item 4. Mine Safety Disclosures

Not applicable.

PART II

Item 5. Market For Registrant’s Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities **Market Information**

Our stock previously traded on the NASDAQ Capital Market. On February 23, 2016 the Company received notice from NASDAQ stating that NASDAQ had determined to delist the Company's common stock. On May 20, 2017 our common stock was delisted from the OTCQB Venture Market and began trading on the OTCBB. Our trading symbol is “ASTI.” The following table sets forth the high and low sales price information per share for our common stock for the last two completed fiscal years, as adjusted for reverse stock splits.

Price Range of Common Stock

	High	Low
Fiscal 2017		
First Quarter	\$ 7.8000	\$ 1.4000
Second Quarter	\$ 2.3000	\$ 0.3000
Third Quarter	\$ 2.6000	\$ 0.4000
Fourth Quarter	\$ 1.8000	\$ 0.7000
Fiscal 2018		
First Quarter	\$ 0.7000	\$ 0.3000
Second Quarter	\$ 0.5000	\$ 0.0003
Third Quarter	\$ 0.3000	\$ 0.0420
Fourth Quarter	\$ 0.0600	\$ 0.0080

Holdings

As of December 31, 2018, the number of record holders of our common stock was 41. Because many of our shares of common stock are held by brokers and other institutions on behalf of stockholders, we are unable to estimate the total number of stockholders represented by these record holders.

Dividends

The holders of common stock are entitled to receive such dividends as may be declared by our Board of Directors. During the years ended December 31, 2018 and 2017, we did not pay any common stock dividends, and we do not expect to declare or pay any dividends in the foreseeable future. Payment of future dividends will be within the discretion of our Board of Directors and will depend on, among other factors, our retained earnings, capital requirements, and operating and financial condition.

Item 6. Selected Financial Data

Smaller reporting companies are not required to provide the information required by this Item.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

The following discussion of our financial condition and results of operations should be read in conjunction with our audited financial statements and the notes to those financial statements appearing elsewhere in this Form 10-K. This discussion and analysis contains statements of a forward-looking nature relating to future events or our future financial performance. As a result of many factors, our actual results may differ materially from those anticipated in these forward-looking statements. These statements involve known and unknown risks, uncertainties and other factors that may cause our actual results, levels of activity, performance or achievements to be materially different from any future results, levels of activity, performance or achievements expressed or implied by these forward-looking statements.

Overview

We are a company formed to commercialize flexible PV modules using our proprietary technology. For the year ended December 31, 2018, we generated \$862,412 of revenue. Our revenue of \$813,512 from product sales accounted for 94% of total revenue and \$48,900 of revenue generated from government research and development contracts during the year accounted for the remainder. As of December 31, 2018, we had an accumulated deficit of approximately \$419 million.

In 2012, we evolved our business model to include B2C, solution based, PV integrated consumer electronics to our off grid high value solar power generation strategy. In June of 2012, we launched our new line of consumer products under the EnerPlex™ brand, and introduced our first product, the Surfr™; a battery and solar case for the Apple® iPhone® 4/4S smart phone featuring our ultra-light CIGS thin film technology integrated directly into the case. The case incorporates our ultra-light and thin PV module into a sleek, protective iPhone 4/4S case, along with a thin, life extending, lithium-polymer battery. The case adds minimal weight and size to an iPhone smartphone, yet provides supplemental charging when needed. In August of 2012, we announced the launch of the second version of the Surfr 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 Kickr IV was an extremely portable, compact and durable solar charging device, approximately seven inches by seven inches when folded, and weighs less than half a pound. The Kickr IV provides 6.5 watts of regulated power that can help charge phones, digital cameras, and other small USB enabled devices. The Kickr IV is ideal for outdoor activities such as camping, hiking and mountain climbing as well as daily city use. To complement the Kickr IV, we also released the Jumpr series of portable power banks in December of 2012. The Jumpr series provides a compact power storage solution for those who need to recharge their portable electronics while on the go.

During 2013, the EnerPlex brand rapidly expanded with the addition of two new product series as well as over fifteen new products. In 2013, we introduced further additions to the Jumpr line of portable power banks; releasing the Jumpr Mini and Jumpr Stack in August and the Jumpr Max in September. The latest additions to the Kickr line of portable solar chargers, the Kickr I and Kickr II, were introduced in August at the Outdoor Retailer show. In October 2013, we released our first series of solar integrated backpacks, the EnerPlex Packr™. The Packr is a functional backpack ideal for charging mobile electronic devices while on the go. Also in October of 2013, we introduced the Surfr battery and solar case for the Samsung Galaxy S® 4, and in December 2013, we introduced the Surfr battery and solar case for Apple's iPhone® 5. To complement our flagship product lines, we added an assortment of accessories, all of which can be integrated into the EnerPlex ecosystem of products; the LED wand, which can be easily plugged into a Jumpr power bank to provide hours of light, or the Travel Adaptor, which enables consumers to charge up their Jumpr power banks from a traditional outlet anywhere in the world.

Beginning in 2013, we aggressively pursued new distribution channels for the EnerPlex brand; these activities led to placement in a variety of high-traffic ecommerce venues such as www.amazon.com, www.walmart.com, www.brookstone.com, www.newegg.com, as well as many others including our own e-commerce platform at www.goenerplex.com. The April 2013 placement of EnerPlex products at Fry's Electronics, a US West Coast consumer electronics retailer, represented the company's first domestic retail presence; EnerPlex products were carried in all of Fry's 34 superstores across 9 states.

Throughout 2014, EnerPlex released multiple additions to the Jumpr line of products: including the Jumpr Stack 3, 6 and 9; innovative batteries equipped with tethered micro-USB and Apple Lightning cables with a revolutionary Stack and Charge design, enabling batteries to be charged simultaneously when they are placed on top of one another. Also released in 2014 were the Jumpr Slate series, products which push the boundaries of how thin batteries can be; the Jumpr Slate 10k, at less than 7mm thick was the thinnest lithium polymer battery available when it was released. The Jumpr Slate 5k and 5k Lightning each come with a tethered micro-USB and Lightning cable respectively; freeing consumers from worrying about toting extra cables with them while on the move.

At Outdoor Retailer 2014, EnerPlex debuted the Generatr Series. The Generatr 1200 and Generatr 100 are lithium-ion based, large format batteries. Lighter and smaller than competitors, the Generatr Series are targeted for consumers who require high-capacity, high-output batteries which remain ultra-portable. Also debuted at Outdoor Retailer was the Commandr 20, a high output solar charger designed specifically to integrate with and charge the Generatr series, allowing consumers to stay out longer without needing to charge their Generatr batteries from a traditional power source. In August 2014, the Kickr II+ and IV+ were also announced, these products represent another evolution in the EnerPlex line of solar products; integrated with a 500mAh battery the Kickr II+ and IV+ are able to provide a constant flow of power even when there are intermittent disruptions in sunlight.

During 2015, we reached an agreement with EVINE Live, one of the premier home shopping networks with TV programming that reaches over 87 million US homes to begin selling EnerPlex products during their broadcasts. EnerPlex launched the Generatr S100 and select other products exclusively with EVINE, EnerPlex also launched the Generatr 1200 launched exclusively with EVINE for a limited period. Also during 2015, EnerPlex expanded its relationship with The Cellular Connection to include over 450 Verizon Wireless Premium Retail Stores; launched its products with two world recognized retailers; The Sports Authority and Cabela's; and launched its products with GovX; the premier online shopping destination for Military, Law Enforcement and Government agencies. Internationally, EnerPlex products became available in the United Kingdom via the brand's launch with 172 Maplin's stores throughout the country.

In 2016, EnerPlex launched the new emergency sales vertical, partnering with Emergency Preparedness eCommerce leader, Emergency Essentials, and we announced new breakthroughs in the Company's line of high-voltage solar products, designed specifically for high-altitude and space markets. Also during the first quarter of 2016, the Company announced the launch of select products on the GSA Advantage website; allowing Federal employees, including members of all branches of the US Military, to directly purchase Ascent and EnerPlex products including: the MilPak E, Commandr 20, Kickr 4 and WaveSol™ solar modules.

In January 2017, Ascent was awarded a contract to supply high-voltage SuperLight thin-film CIGS PV blankets. These 50W, fully laminated, flexible blankets were manufactured using a new process that was optimized for high performance in near-space conditions at elevated temperatures, and are custom designed for easy modular integration into series and parallel configurations to achieve the desired voltage and current required for such application.

In February 2017 Ascent announced the discontinuation of our EnerPlex consumer business by disposing of the EnerPlex brand, and related intellectual properties and trademarks, to our battery product supplier, Sun Pleasure Co. Limited ("SPCL"). This transaction was completed in an effort to better allocate our resources and to continue to focus on our core strength in the high-value specialty PV market. Following the transfer, Ascent will no longer be producing or selling EnerPlex-branded consumer products. Ascent will focus on its photovoltaic business and will supply solar PV products to SPCL, supporting the continuous growth of EnerPlex with Ascent's proprietary and award-winning thin-film solar technologies and products.

During the third quarter of 2017, Ascent Solar was selected by Energizer to develop and supply solar panels for their PowerKeep line of solar products, and in November 2017, Ascent introduced the next generation of our USB-based portable power systems with the XD™ series. The first product introduced was the XD-12 which, like previous products, is a folding, lightweight, easily stowable, PV system with USB power regulation. Unique to this generation of PV portable power is more PV power (12 Watts) and a 2.0 Amp smart USB output to enable the XD-12 to charge most smartphones, tablets, and USB-enabled devices as fast as a wall outlet. The enhanced smart USB circuit works with the device to be charged so that the device can determine the maximum power it is able to receive from the XD-12, and ensures the best possible charging performance directly from the sun.

Also in 2017, for a space customer, Ascent manufactured a new micro-module, approximately 12.8mm x 50mm (0.5in x 2.0in) in size that is ideal for both laboratory-scale environmental testing, and for subsequent integration into flight experiments.

In February 2018, the Company introduced the second product in our XD series. Delivering up to 48 Watts of solar power, the durable and compact Ascent XD-48 Solar Charger is the ideal solution for charging many portable electronics and off-grid power systems. The XD-48's versatility allows it to charge both military and consumer electronics directly from the sun wherever needed. Like the XD-12, the XD-48 has a compact and portable design, and its rugged, weather-resistant construction withstands shocks, drops, damage and even minor punctures to power through the harshest conditions.

In March 2018, Ascent successfully shipped to a European based customer for a lighter-than-air, helium-filled airship project based on our newly developed ultra-light modules with substrate material than half of the thickness of our standard modules.

We continue to design and manufacture PV integrated consumer electronics as well as portable power applications for commercial and military users. Due to the high durability enabled by the monolithic integration employed by our technology, the capability to customize modules into different form factors and the industry leading light weight and flexibility provided by our modules, we believe that the potential applications for our products are numerous.

Commercialization and Manufacturing Strategy

We manufacture our products by affixing a thin CIGS layer to a flexible, plastic substrate using a large format, roll-to-roll process that permits us to fabricate our flexible PV modules in an integrated sequential operation. We use proprietary monolithic integration techniques which enable us to form complete PV modules with little to no costly back end assembly of inter cell connections. Traditional PV manufacturers assemble PV modules by bonding or soldering discrete PV cells together. This manufacturing step typically increases manufacturing costs and at times proves detrimental to the overall yield and reliability of the finished product. By reducing or eliminating this added step using our proprietary monolithic integration techniques, we believe we can achieve cost savings in, and increase the reliability of, our PV modules. All tooling necessary for us to meet our near term production requirements is installed in our Thornton, Colorado plant. In 2012, we further revised our strategy to focus on applications for emerging and high-value specialty PV markets, including off grid, aerospace, military and defense and consumer oriented products.

We plan to continue the development of our current PV technology to increase module efficiency, improve our manufacturing tooling and process capabilities and reduce manufacturing costs. We also plan to continue to take advantage of research and development contracts to fund a portion of this development.

Related Party Activity

On February 2, 2012, we announced the appointment of Victor Lee as President and Chief Executive Officer. Mr. Lee has served on our Board since November 2011 and is currently the managing director of Tertius Financial Group Pte Ltd ("TFG").

TFG is a Singapore based entity controlled and 50% owned by Ascent's President & CEO, Victor Lee, and owns approximately 1% of the Company's outstanding shares at December 31, 2018 .

On August 29, 2016, the Company entered into a note purchase agreement with Tertius Financial Group Pte. Ltd. ("TFG") for the private placement of \$330,000 of the Company's original issue discount notes with an original maturity date of November 29, 2016. The notes bear interest of 6% per annum and principal and interest on the notes are payable upon maturity. The notes are unsecured and not convertible into equity shares of the Company.

On December 6, 2016, the Company issued a new \$600,000 original issue discount note to TFG in exchange for (i) \$200,000 of additional gross proceeds and (ii) cancellation of the existing outstanding \$330,000 note. The new TFG note bears interest at a rate of 6% per annum and matured on December 31, 2017. Principal and interest on the new TFG note were payable at maturity. Following the transaction, the outstanding balance of the new note was \$602,000 (including accrued and unpaid interest) with a discount of \$60,000 .

On January 19, 2017, the Company issued 333,334 shares of unregistered common stock in a private placement to TFG pursuant to a Securities Purchase Agreement (the "SPA").

Pursuant to the SPA, the Company issued the 333,334 shares to TFG in exchange for cancellation of its \$600,000 promissory note (including accrued interest of approximately \$4,340) that was issued by the Company on December 6, 2016. The SPA does not provide any registration rights for the shares issued to TFG.

Significant Trends, Uncertainties and Challenges

We believe the significant trends, uncertainties and challenges that directly or indirectly affect our financial performance and results of operations include:

- Our ability to generate customer acceptance of and demand for our products;
- Successful ramping up of commercial production on the equipment installed;
- Our products are successfully and timely certified for use in our target markets;
- Successful operating of 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 ability to raise sufficient capital to enable us to reach a level of sales sufficient to achieve profitability on terms favorable to us;
- Effective management of the planned ramp up of our domestic and international operations;
- Our ability to successfully develop and maintain strategic relationships with key partners, including OEMs, system integrators, distributors, retailers and e-commerce companies, who deal directly with end users in our target markets;
- Our ability to maintain the listing of our common stock on the OTCBB Market;
- Our ability to implement remediation measures to address material weaknesses in internal control;
- 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.

Basis of Presentation: The accompanying consolidated financial statements have been derived from the accounting records of Ascent Solar Technologies, Inc., Ascent Solar (Asia) Pte. Ltd., and Ascent Solar (Shenzhen) Co., Ltd. (collectively, "the Company") as of December 31, 2018 and December 31, 2017 , and the results of operations for the years ended December 31, 2018 and 2017 . Ascent Solar (Shenzhen) Co., Ltd. is wholly owned by Ascent Solar (Asia) Pte. Ltd., which is wholly owned by Ascent Solar Technologies, Inc. All significant inter-company balances and transactions have been eliminated in the accompanying consolidated financial statements.

Significant Accounting Policies

Related Party Transactions: One of the Company's named shareholders is Tertius Financial Group Pte Ltd of which Mr. Victor Lee, President and Chief Executive Officer of the Company, is Managing Director and 50% shareholder. Please refer to Note 11 for further information on transactions with Tertius Financial Group.

Inventories: All inventories are stated at the lower of cost or net realizable value, with cost determined using the weighted average method. Inventory balances are frequently evaluated to ensure they do not exceed net realizable value. The computation for net realizable value takes into account many factors, including expected demand, product life cycle and development plans, module efficiency, quality issues, obsolescence and others. Management's judgment is required to determine reserves for obsolete or excess inventory. As of December 31, 2018 and 2017, the Company had inventory reserve balances of \$745,927 and \$562,140, respectively. In response to management's estimate of current market conditions, the Company has reserved all of its work-in-process and finished goods inventory as of December 31, 2018. If actual demand and market conditions are less favorable than those estimated by management, additional inventory write downs may be required.

Due to the sale of the EnerPlex brand and the re-purposing of our work-in-process inventory, we are unable to estimate the recoverability of all of our work-in-process inventory values, resulting in a lower-cost-to-market analysis and reserve for impairment. An expense of \$363,377 was recorded to inventory impairment costs for the year ended December 31, 2017. There were no lower of cost or market adjustments during the year ended December 31, 2018.

Impairment of Long-lived assets: We analyze our long-lived assets (property, plant and equipment) and definitive-lived intangible assets (patents) for impairment, both individually and as a group, whenever events or changes in circumstances indicate the carrying amount of the assets may not be recoverable. Events that might cause impairment would include significant current period operating or cash flow losses associated with the use of a long-lived asset or group of assets combined with a history of such losses, significant changes in the manner of use of assets and significant negative industry or economic trends. An undiscounted cash flow analysis is calculated to determine if an impairment exists. If an impairment is determined to exist, any related loss is calculated using the difference between the fair value and the carrying value of the assets. During the years ended December 31, 2018 and 2017, we did not incur impairments of our manufacturing facilities and equipment.

Convertible Preferred Stock: The Company evaluates its preferred stock instruments under FASB ASC 480, "*Distinguishing Liabilities from Equity*" to determine the classification, and thereby the accounting treatment, of the instruments. Please refer to Notes 13 and 14 for further discussion on the classification of each instrument.

Derivatives: The Company evaluates its financial instruments under FASB ASC 815, "*Derivatives and Hedging*" to determine whether the instruments contain an embedded derivative. When an embedded derivative is present, the instrument is evaluated for a fair value adjustment upon issuance and at the end of every period. Any adjustments to fair value are treated as gains and losses in fair values of derivatives and are recorded on the Statement of Operations. Please refer to Notes 10 and 12 for further discussion on the embedded derivatives of each instrument.

Revenue Recognition:

Product revenue. We recognize revenue for module and other equipment sales at a point in time following the transfer of control of such products to the customer, which typically occurs upon shipment or delivery depending on the terms of the underlying contracts. For module and other equipment sales contracts that contain multiple performance obligations, we allocate the transaction price to each performance obligation identified in the contract based on relative standalone selling prices, or estimates of such prices, and recognize the related revenue as control of each individual product is transferred to the customer, in satisfaction of the corresponding performance obligations.

During the years ended December 31, 2018 and 2017, the company recognized product revenue of \$813,512 and \$642,179, respectively.

Government contracts revenue. Revenue from government research and development contracts is generated under terms that are cost plus fee or firm fixed price. We generally recognize this revenue over time using cost based input methods, which recognize revenue and gross profit as work is performed based on the relationship between actual costs incurred compared to the total estimated costs of the contract. In applying cost based input methods of revenue recognition, we use the actual costs incurred relative to the total estimated costs to determine our progress towards contract completion and to calculate the corresponding amount of revenue to recognize.

Cost based input methods of revenue recognition are considered a faithful depiction of our efforts to satisfy long-term government research and development contracts and therefore reflect the performance obligations under such contracts. Costs incurred that do not contribute to satisfying our performance obligations are excluded from our input methods of revenue recognition as the amounts are not reflective of our transferring control under the contract. Costs incurred towards contract completion may include direct costs plus allowable indirect costs and an allocable portion of the fixed fee. If actual and estimated costs to complete a contract indicate a loss, provision is made currently for the loss anticipated on the contract.

During the year ended December 31, 2018, the company recognized government contract revenue of \$48,900. No government contract revenue was recognized for the year ended December 31, 2017.

Research, Development and Manufacturing Operations Costs: Research, development and manufacturing operations expenses were approximately \$2,794,641 and \$4,820,536 for the years ended December 31, 2018 and 2017, respectively. Research, development and manufacturing operations expenses include: 1) technology development costs, which include expenses incurred in researching new technology, improving existing technology and performing federal government research and development contracts, 2) product development costs, which include expenses incurred in developing new products and lowering product design costs, and 3) pre-production and production costs, which include engineering efforts to improve production processes, material yields and equipment utilization, and manufacturing efforts to produce saleable product. Research, development and manufacturing operations costs are expensed as incurred, with the exception of costs related to inventoried raw materials, work-in-process and finished goods, which are expensed as Cost of revenue as products are sold.

Share-Based Compensation: We measure and recognize compensation expense for all share-based payment awards made to employees, officers, directors, and consultants based on estimated fair values. The value of the portion of the award that is ultimately expected to vest is recognized as expense over the requisite service period in our statements of operations included herein. Share-based compensation is based on awards ultimately expected to vest, reduced by estimated forfeitures. Forfeitures are estimated at the time of grant and revised, as necessary, in subsequent periods if actual forfeitures differ from those estimates. For purposes of determining estimated fair value of share-based payment awards on the date of grant, we use the Black-Scholes option-pricing model ("Black-Scholes Model") for option awards. The Black-Scholes Model requires the input of highly subjective assumptions. Because our employee stock options may have characteristics significantly different from those of traded options, and because changes in the subjective input assumptions can materially affect the fair value estimate, in management's opinion, the existing models may not provide a reliable single measure of the fair value of our employee stock options. Management will continue to assess the assumptions and methodologies used to calculate estimated fair value of share-based compensation. Circumstances may change and additional data may become available over time, which result in changes to these assumptions and methodologies, which could materially impact our fair value determination. We estimate the fair value of our restricted stock awards at our stock price on the grant date.

The accounting guidance for share-based compensation may be subject to further interpretation and refinement over time. There are significant differences among option valuation models, and this may result in a lack of comparability with other companies that use different models, methods and assumptions. If factors change and we employ different assumptions in the accounting for share-based compensation in future periods, or if we decide to use a different valuation model, the compensation expense we record in the future may differ significantly from what we have recorded in the current period and could materially affect our loss from operations, net loss and net loss per share.

Use of Estimates: The preparation of financial statements in conformity with U.S. generally accepted accounting principles ("GAAP") requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Recently Issued Accounting Standards

In May 2014, the FASB issued ASU No. 2014-09, *Revenue from Contracts with Customers (Topic 606)*, and has issued a number of clarifying ASUs subsequently, all of which outline a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers and supersedes most current revenue recognition guidance, including industry-specific guidance. The core principle of the revenue model is that "an entity recognizes revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services." The standard provides enhancements to the quality and consistency of how revenue is reported by companies, while also improving comparability in the financial statements of companies reporting using International Financial Reporting Standards or U.S. GAAP. The new standard also will require enhanced revenue disclosures, provide guidance for transactions that were not previously addressed comprehensively, and improve guidance for multiple-element arrangements. This accounting standard becomes effective for the Company for reporting periods beginning after December 15, 2017, and interim reporting periods thereafter. Early adoption is permitted for annual reporting periods (including interim periods) beginning after December 15, 2016. This new standard permits the use of either the retrospective or cumulative effect transition method. The implementation of ASU 2014-09 did not have a material effect on the Company's consolidated financial statements.

In February 2016, the FASB issued ASU No. 2016-02, *Leases (Topic 842)*. ASU 2016-02 requires lessees to recognize all leases, including operating leases, on the balance sheet as a lease asset or lease liability, unless the lease is a short-term lease. ASU 2016-02 also requires additional disclosures regarding leasing arrangements. ASU 2016-02 is effective for interim periods and fiscal years beginning after December 15, 2018, and early application is permitted. The Company has evaluated the adoption of this guidance and has determined there will not be a material impact on its consolidated financial statements.

In May 2017, the FASB issued ASU No. 2017-09, *Compensation - Stock Compensation (Topic 718)*. ASU 2017-09 provides guidance about which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting in Topic 718. ASU 2017-09 is effective for interim periods and fiscal years beginning after December 15, 2017, and early application is permitted. The implementation of ASU 2017-09 did not have a material effect on the Company's consolidated financial statements.

In July 2017, the FASB issued ASU No. 2017-11 *Part I, Earnings Per Share (Topic 260), Distinguishing Liabilities from Equity (Topic 480), Derivatives and Hedging (Topic 815)*. ASU 2017-11 Part I changes the classification analysis of certain equity linked financial instruments with down round features. ASU 2017-11 Part I is effective, for public business entities, for interim periods and fiscal years beginning after December 15, 2018, and early application is permitted. The Company has evaluated the adoption of this guidance and has determined there will not be a material impact on its consolidated financial statements.

In June 2018, the FASB issued ASU No. 2018-07, *Compensation-Stock Compensation (Topic 718): Improvements to Non-employee Share-Based Payment Accounting*, which simplifies the accounting for share-based payments to non-employees by aligning it with the accounting for share-based payments to employees, with specified exceptions. This standard is effective for the Company in the first quarter of 2020, and early adoption is permitted. The Company expects the adoption of this standard will not have a material impact on its consolidated financial statements.

In August 2018, the FASB issued ASU No. 2018-13, *Fair Value Measurement (Topic 820): Disclosure Framework-Changes to the Disclosure Requirements for Fair Value Measurement*, which modifies the disclosure requirements of fair value measurements. This standard is effective for the Company in the first quarter of 2020, and early adoption is permitted. The Company is currently evaluating the impact of the effect adoption of this standard will have on its consolidated financial statements.

Other new pronouncements issued but not effective as of December 31, 2018 are not expected to have a material impact on the Company's consolidated financial statements.

Results of Operations

Comparison of the Years Ended December 31, 2018 and 2017

Revenues. Our revenues were \$862,412 for the year ended December 31, 2018 compared to \$642,179 for the year ended December 31, 2017, an increase of \$220,233. The following factors contributed to this increase:

1. Net product revenues were \$813,512 for the year ended December 31, 2018 compared to \$642,179 for the year ended December 31, 2017, an increase of \$171,333. The increase in product sales is the result of our increased focus on PV sales.
2. Revenues generated from government research and development contracts were \$48,900 during the year ended December 31, 2018, the Company did not have any revenues attributable to government research and development contracts during the year ended December 31, 2017.

Cost of revenues. Our Cost of revenues for the year ended December 31, 2018 was \$1,015,796 compared to \$2,814,782 for the year ended December 31, 2017, a decrease of \$1,798,986. The decrease in cost of revenues is mainly due to the decrease in materials and labor costs as a result of a decrease in production for the year ended December 31, 2018 compared to 2017. Cost of revenues for the year ended December 31, 2018 is comprised of materials and freight of \$370,142, direct labor of \$2,930, and overhead of \$642,724. Management believes our factory is currently significantly under-utilized, and a substantial increase in revenue would result in marginal increases to Direct Labor and Overhead included in the Cost of revenues. As such management's focus going forward is to improve gross margin through increased sales and improved utilization of our factory. We are currently pursuing high-value PV markets.

Research, development and manufacturing operations. Research, development and manufacturing operations costs were \$2,794,641 for the year ended December 31, 2018, compared to \$4,820,536 for the year ended December 31, 2017, a decrease of \$2,025,895. Research, development and manufacturing operations costs include costs incurred for product development, pre-production and production activities in our manufacturing facility. Research, development and manufacturing operations costs also include costs related to technology development and governmental contracts. The following factors contributed to the decrease in research, development, and manufacturing operations expenses during the year ended December 31, 2018:

1. Personnel and facility related expenses decreased approximately \$1,941,932, as compared to the same time period of 2017. The decrease in personnel and facility related costs was primarily due to a reduction in headcount and the use of contractors.
2. Materials and equipment related expenses, decreased approximately \$83,963, as compared to the same time period of 2017. The decrease was due to a decrease in production of research and development products.

Inventory impairment costs. Due to the sale of the EnerPlex brand and the re-purposing of our work-in-process inventory, we were unable to estimate the recoverability of all of our work-in process inventory values, resulting in a lower-cost-to-market analysis and reserve for impairment. An expense of \$363,377 was recorded to inventory impairment costs for the year ended December 31, 2017. There was no corresponding impairment for the year ended December 31, 2018.

Selling, general and administrative. Selling, general and administrative expenses were \$3,244,793 for the year ended December 31, 2018, compared to \$5,598,004 for the year ended December 31, 2017, a decrease of \$2,353,211. The following factors contributed to the decrease in selling, general, and administrative expenses during the year ended December 31, 2018:

1. Personnel and facility related costs decreased \$2,288,728 during the year ended December 31, 2018, as compared to the the year ended December 31, 2017. The overall decrease in personnel related costs was primarily due a lower headcount for the the year ended December 31, 2018, as compared to the the year ended December 31, 2017 as well as the decreased use of consultants and contractors during the same period.
2. Marketing and related expenses decreased \$163,760 during the year ended December 31, 2018, as compared to the the year ended December 31, 2017. The decrease in Marketing and related expenses is due to reduced marketing, advertising, and promotional activities during the the year ended December 31, 2018, compared to the same time period of 2017, which is the direct result of reducing our marketing budget to focus more on the development of our PV.
3. Legal expenses increased \$308,277 during the year ended December 31, 2018, as compared to the the year ended December 31, 2017. The primary reasons for the increase is due to increased general legal expenses related to financing efforts as compared to the the year ended December 31, 2017, offset by decreases in legal expenses related to our patent activity as compared to the same period of 2017.
4. Public company expenses decreased \$2,908 during the year ended December 31, 2018, as compared to the the year ended December 31, 2017. This decrease is primarily due to reduced filing fees related to financing agreements in 2018, as compared to 2017.
5. Bad debt and settlement expenses decreased approximately \$206,092 during the year ended December 31, 2018, as compared to the year ended December 31, 2017. During 2017 we recorded payments and settlements against existing reserves. We did not have settlement expenses during 2018.

Other Expense, net. Other expense was \$9,466,368 for the year ended December 31, 2018, compared to \$4,412,075 for the the year ended December 31, 2017, an increase of approximately \$5,054,293. The following factors contributed to the increase in other expense during the year ended December 31, 2018:

1. Interest expense increased approximately \$832,934, as compared to the year ended December 31, 2017. The increase is primarily due to an increase of non-cash interest expense related to convertible debt and promissory notes.
2. During the year ended December 31, 2017, the Company recorded net other income of \$574,817. This income was comprised of \$1,210,331 increase in gain on sale of assets after the transfer of the EnerPlex IP, offset by induced conversion costs of \$635,514 on several of the financial instruments. During the the year ended December 31, 2018, the Company recorded net other income of \$13,144, primarily as the result of a sale of assets; an income reduction of \$561,673.
3. During the year ended December 31, 2017, the Company recorded warrant expense of \$345,774. There was no such expense during the year ended December 31, 2018.

4. Gains and losses on change in fair value of derivatives and on extinguishment of liabilities, was a net loss of \$2,127,831 for the year ended December 31, 2018 , as compared to a net gain of \$1,877,629 for the year ended December 31, 2017 . The change of \$4,005,460 in this non-cash item is attributable to a net loss of \$138,392 on the change in fair value of our embedded derivative instruments during the year ended December 31, 2018 , compared to a net gain \$4,450,518 in 2017 , offset by a reduction in the loss from extinguishment of liabilities of \$306,666 , related to conversions and redemptions of certain convertible notes and preferred stock, for the year ended December 31, 2018 , as compared to the the year ended December 31, 2017 .

Net Loss. Our Net Loss was \$16,036,492 for the year ended December 31, 2018 , compared to a Net Loss of \$18,560,130 for the year ended December 31, 2017 , an improvement of \$2,523,638 .

The decrease in Net Loss for the year ended December 31, 2018 can be summarized in variances in significant account activity as follows:

	(Increase) decrease in Net Loss For the Year Ended December 31, 2018 Compared to the Year Ended December 31, 2017
Revenues	(220,233)
Cost of Revenue	1,798,986
Research, development and manufacturing operations	
Materials and Equipment Related Expenses	83,963
Personnel and Facility Related Expenses	1,941,932
Inventory impairment costs	363,377
Selling, general and administrative expenses	
Personnel, Administrative, and Facility Related Expenses	2,288,728
Marketing Related Expenses	163,760
Legal Expenses	(308,277)
Public Company Costs	2,908
Bad Debt Expense	206,092
Depreciation and Amortization Expense	816,229
Other Income/Expense	
Interest Expense	832,934
Other Income/Expense	561,673
Warrant Expense	(345,774)
Non-Cash Change in Fair Value of Derivative Liabilities and Gain/Loss on Extinguishment of Liabilities, net	4,005,460
Decrease to Net Loss	<u>\$ 2,523,638</u>

Liquidity and Capital Resources

The Company has continued limited PV production at its manufacturing facility. The Company does not expect that sales revenue and cash flows will be sufficient to support operations and cash requirements until it has fully implemented its product strategy. During the year ended December 31, 2018 the Company used \$4,015,846 in cash for operations. The Company's primary significant long term cash obligation consists of a note payable of \$5,378,062 to a financial institution secured by a mortgage on its headquarters and manufacturing building in Thornton, Colorado. Total payments of approximately \$693,611 , including principal and interest, will come due in the remainder of 2019.

Additional projected product revenues are not anticipated to result in a positive cash flow position for the year 2019 overall and, as of December 31, 2018 , the Company has negative working capital. As such, cash liquidity sufficient for the year ending December 31, 2019 will require additional financing.

The Company continues to accelerate sales and marketing efforts related to its consumer and military solar products and specialty PV application strategies through expansion of its sales and distribution channels. The Company has begun activities related to securing additional financing through strategic or financial investors, but there is no assurance the Company will be able to raise 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.

As a result of the Company's recurring losses from operations, and the need for additional financing to fund its operating and capital requirements, there is uncertainty regarding the Company's ability to maintain liquidity sufficient to operate its business effectively, which raises substantial doubt as to the Company's ability to continue as a going concern. The Company has scaled down its operations, due to cash flow issues, and does not expect to ramp up until significant financing is obtained.

Management cannot provide any assurances that the Company will be successful in accomplishing any of its plans. These consolidated financial statements do not include any adjustments that might be necessary should the Company be unable to continue as a going concern.

Statements of Cash Flows Comparison of the Years Ended December 31, 2018 and 2017

For the year ended December 31, 2018, our cash used in operations was \$4,015,846 compared to \$12,597,929 for the year ended December 31, 2017, a decrease of \$8,582,083. The decrease is primarily the result of reduced operations during the current year. For the year ended December 31, 2018, cash used in investing activities was \$2,447 compared to cash provided by investing activities of \$80,946 for the year ended December 31, 2017. This decrease was the result of a reduction in proceeds on the sale assets, offset by reduced spending on capital assets and patents. During the year ended December 31, 2018, negative operating cash flows of \$4,015,846 million were funded through \$4,103,500 million in new debt issuances, offset by repayments on debt of \$145,666 and payment of financing costs of \$11,000.

Off Balance Sheet Transactions

As of December 31, 2018, we did not have any off balance sheet arrangements as defined in Item 303(a)(4)(ii) of Regulation S-K.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

Foreign Currency Exchange Risk

We hold no significant funds and have no future obligations denominated in foreign currencies as of December 31, 2018.

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 may operate, make sales and buy materials. As a result, we are subject to currency translation risk. Further, changes in exchange rates between foreign currencies and the U.S. Dollar could affect our future net sales and cost of sales and could result in exchange losses.

Interest Rate Risk

Our exposure to market risks for changes in interest rates relates primarily to our cash equivalents and investment portfolio. As of December 31, 2018, our cash equivalents consisted only of operating accounts held with financial institutions. From time to time, we hold restricted funds, money market funds, investments in U.S. government securities and high quality corporate securities. The primary objective of our investment activities is to preserve principal and provide liquidity on demand, while at the same time maximizing the income we receive from our investments without significantly increasing risk. The direct risk to us associated with fluctuating interest rates is limited to our investment portfolio, and we do not believe a change in interest rates will have a significant impact on our financial position, results of operations, or cash flows.

Credit Risk

From time to time, we hold certain financial and derivative instruments that potentially subject us to credit risk. These consist primarily of cash, cash equivalents, restricted cash, investments, and forward foreign currency option contracts. We are exposed to credit losses in the event of nonperformance by the counter parties to our financial and derivative instruments. We place cash, cash equivalents, investments and forward foreign currency option contracts with various high quality financial institutions, and exposure is limited at any one institution. We continuously evaluate the credit standing of our counter party financial institutions.

Item 8. Financial Statements and Supplementary Data

The Financial Statements and Supplementary Data required by this item are included in Part IV, Item 15(a)(1) and are presented beginning on Page F-1.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None.

Item 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

We maintain disclosure controls and procedures designed to ensure that information required to be disclosed in our reports filed or submitted under the Securities Exchange Act of 1934, as amended (the "Exchange Act") is recorded, processed, summarized and reported within the time periods specified in Securities and Exchange Commission rules and forms. Our disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed in our reports filed under the Exchange Act is accumulated and communicated to management as appropriate to allow timely decisions regarding required disclosures. Our management conducted an evaluation required by Rules 13a-15 and 15d-15 under the Exchange Act of the effectiveness of our disclosure controls and procedures as defined in Rules 13a-15 and 15d-15 under the Exchange Act as of December 31, 2018 . Based on this evaluation, our management concluded the design and operation of our disclosure controls and procedures were not effective as of December 31, 2018 .

Management's Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act. Our system of internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles ("GAAP") in the United States of America and includes those policies and procedures that:

- pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of our assets;
- provide reasonable assurance transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and our receipts and expenditures are being made only in accordance with authorizations of our management and directors; and
- provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on our financial statements.

Under the supervision of the Audit Committee of the Board of Directors and with the participation of our management, including our Chief Executive Officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting using the criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this evaluation, our management concluded our internal control over financial reporting were not effective as of December 31, 2018 . Our management reviewed the results of its assessment with the Audit Committee.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

A material weakness is a deficiency, or combination of deficiencies, in internal control over financial reporting such that there is a reasonable possibility that a material misstatement of the Company's annual or interim financial statements will not be prevented or detected on a timely basis.

Material Weakness Identified in 2018

Based on our assessment and the criteria used, management concluded that our internal control over financial reporting as of December 31, 2018 was not effective due to the material weaknesses described as follows:

- The Company was understaffed and did not have sufficiently trained resources with the technical expertise to ensure that all company transactions were accounted for in accordance with GAAP. This deficiency arose primarily from staff turnover and the inability of the Company to devote sufficient replacement resources in a timely manner, as a result of the Company's financial situation

As a consequence, the Company did not have effective process level control activities over the following:

- Accounting for the Company's inventory and cost of revenue was lacking for the preparation of the December 31, 2018 financial statements. Miscalculations in these areas could impact the Company's current assets, revenues, operating results, and cash flows.

The control deficiencies described above created a reasonable possibility that a material misstatement to the consolidated financial statements would not be prevented or detected on a timely basis. The control deficiencies described above resulted in material misstatements in the preliminary consolidated financial statements that were corrected prior to the issuance of the consolidated financial statements as of and for the fiscal year ended December 31, 2018. This deficiency did not exist as of and for the year ended December 31, 2017, as such, management concluded the design and operation of our disclosure controls and procedures were effective as of December 31, 2017.

Remediation Plan for Material Weaknesses in Internal Control over Financial Reporting

The Company plans to execute the following steps in 2019 to remediate the aforementioned material weaknesses in its internal control over financial reporting:

- The Company plans to engage a resource, either as internal staff or an external contractor, with the technical expertise to track and report on inventory transactions and cost of revenue calculations.
- The Company will design and implement additional procedures in order to assure that the resource mentioned above and other audit/accounting personnel are more involved with the Company's inventory activities and cost of revenue allocations to monitor and earlier identify accounting issues that may be raised by the Company's ongoing activities.

Changes in Internal Control Over Financial Reporting

Except for the identification and mitigation of the material weaknesses noted above, there were no other changes in internal control over financial reporting during the year ended December 31, 2018 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

Incorporated by reference from the definitive proxy statement for our 2019 annual meeting, which will be filed no later than 120 days after the close of our fiscal year ended December 31, 2018 .

Item 11. Executive Compensation

Incorporated by reference from the definitive proxy statement for our 2019 annual meeting, which will be filed no later than 120 days after the close of our fiscal year ended December 31, 2018 .

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

Incorporated by reference from the definitive proxy statement for our 2019 annual meeting, which will be filed no later than 120 days after the close of our fiscal year ended December 31, 2018 .

Securities Authorized for Issuance under Equity Compensation Plans

The following table sets forth information as of December 31, 2018 relating to all of our equity compensation plans:

	Number of securities to be issued upon exercise of outstanding options, warrants and rights	Weighted average exercise price of outstanding options, warrants and rights	Number of securities remaining available for future issuance under equity compensation plans
Equity compensation plans approved by security holders	110 \$	132,147.00	107

Item 13. Certain Relationships and Related Transactions, and Director Independence

Incorporated by reference from the definitive proxy statement for our 2019 annual meeting, which will be filed no later than 120 days after the close of our fiscal year ended December 31, 2018 .

Item 14. Principal Accounting Fees and Services

Incorporated by reference from the definitive proxy statement for our 2019 annual meeting, which will be filed no later than 120 days after the close of our fiscal year ended December 31, 2018 .

PART IV

Item 15. Exhibits and Financial Statement Schedules

- (a) The following documents are filed as part of this Annual Report on Form 10-K:
- (1) Financial Statements—See Index to Financial Statements at Item 8 of the Annual Report on Form 10-K.
 - (2) Financial Statement Schedules—Supplemental schedules are not provided because of the absence of conditions under which they are required or because the required information is given in the financial statements or notes thereto.
 - (3) Exhibits: See Item 15(b) below.
- (b) Exhibits: The exhibits listed on the accompanying Index to Exhibits on this Form 10-K are filed or incorporated into this Form 10-K by reference.

INDEX TO EXHIBITS

Set forth below is a list of exhibits that are being filed or incorporated by reference into this Annual Report on Form 10-K:

Exhibit No.	Description
3.1	Amended and Restated Certificate of Incorporation (incorporated by reference to Exhibit 3.2 to our Registration Statement on Form SB-2 filed on January 23, 2006 (Reg. No. 333-131216))
3.2	Certificate of Amendment to the Amended and Restated Certificate of Incorporation (incorporated by reference to Exhibit 3.1 to our Quarterly Report on Form 10-Q for the quarter ended September 30, 2011)
3.3	Certificate of Amendment to the Amended and Restated Certificate of Incorporation (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K filed February 11, 2014)
3.4	Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the Company, dated August 26, 2014, (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K filed September 2, 2014)
3.5	Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the Company, dated October 27, 2014 (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K dated October 28, 2014)
3.6	Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the Company, dated December 22, 2014, (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K dated December 23, 2014)
3.7	Second Amended and Restated Bylaws (incorporated by reference to Exhibit 3.2 to our Current Report on Form 8-K filed on February 17, 2009)
3.8	First Amendment to Second Amended and Restated Bylaws (incorporated by reference to Exhibit 3.3 to our Quarterly Report on Form 10-Q for the quarter ended September 30, 2009)
3.9	Second Amendment to Second Amended and Restated Bylaws (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K filed January 25, 2013)
3.10	Third Amendment to Second Amended and Restated Bylaws (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K filed December 18, 2015)
3.11	Certificate of Designations of Preferences, Rights and Limitations of Series F 7% Preferred Stock (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K filed January 20, 2016)
3.12	Certificate of Designations of Preferences, Rights and Limitations of Series G 10% Preferred Stock (incorporated by reference to Exhibit 2 to Exhibits 10.5 and 10.6 to our Current Report on Form 8-K filed May 2, 2016).
3.13	Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the Company, dated May 26, 2016 (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K filed June 2, 2016)

Exhibit No.	Description
3.14	Certificate of Designations of Preferences, Rights and Limitations of Series H 7% Preferred Stock (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K filed June 9, 2016)
3.15	Certificate of Designations of Preferences, Rights and Limitations of Series I Preferred Stock (incorporated by reference to Exhibit 2 to Exhibit 10.1 to our Current Report on Form 8-K filed July 28, 2016)
3.16	Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the Company, dated September 15, 2016 (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K filed September 16, 2016)
3.17	Certificate of Designations of Preferences, Rights and Limitations of Series J Preferred Stock (incorporated by reference to Exhibit 2 to Exhibit 10.1 to our Current Report on Form 8-K filed September 23, 2016)
3.18	Certificate of Amendment to Series G Certificate of Designations (incorporated by reference to Exhibit 3.2 to our Current Report on Form 8-K filed September 23, 2016)
3.19	Certificate of Amendment to Series F Certificate of Designations (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K filed October 11, 2016)
3.20	Certificate of Designations of Preferences, Rights and Limitations of Series J-1 Preferred Stock (incorporated by reference to Exhibit 2 to Exhibit 10.1 to our Current Report on Form 8-K filed October 20, 2016)
3.21	Certificate of Designations of Preferences, Rights and Limitations of Series K Preferred Stock (incorporated by reference to Exhibit 2 to Exhibit 10.1 to our Current Report on Form 8-K filed February 14, 2017)
3.22	Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the Company, dated March 16, 2017 (incorporated by reference to Exhibit 3.2 to our Current Report on Form 8-K filed March 17, 2017)
3.23	Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the Company, dated July 19, 2018 (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K filed July 23, 2018)
4.1	Form of Common Stock Certificate (incorporated by reference to Exhibit 4.1 to our Registration Statement on Form SB-2 filed on January 23, 2006 (Reg. No. 333-131216))
4.2	Certificate of Designations of Series A Preferred Stock (filed as Exhibit 4.2 to our Registration Statement on Form S-3 filed July 1, 2013 (Reg. No. 333-189739))
4.3	Form of Warrant (filed as Exhibit 4.3 to our Registration Statement on Form S-3 filed July 1, 2013 (Reg. No. 333-189739))
4.4	Certificate of Designations of Series B-1 and B-2 Preferred Stock (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K filed October 30, 2013)
4.5	Certificate of Designations of Series C Preferred Stock (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K filed April 2, 2014)

Exhibit No.	Description
4.6	Certificate of Designations of Preferences, Rights and Limitations of Series D Preferred Stock (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K filed November 17, 2014)
4.7	Certificate of Designations of Preferences, Rights and Limitations of Series D-1 Preferred Stock (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K filed February 20, 2015)
4.8	Certificate of Designations, Preferences and Rights of the Series E Convertible Preferred Stock (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K filed on November 10, 2015)
10.1	Securities Purchase Agreement, dated January 17, 2006, between the Company and ITN Energy Systems, Inc. (incorporated by reference to Exhibit 10.1 to our Registration Statement on Form SB-2 filed on January 23, 2006 (Reg. No. 333-131216)) CTR
10.2	Invention and Trade Secret Assignment Agreement, dated January 17, 2006, between the Company and ITN Energy Systems, Inc. (incorporated by reference to Exhibit 10.2 to our Registration Statement on Form SB-2 filed on January 23, 2006 (Reg. No. 333-131216)) CTR
10.3	Patent Application Assignment Agreement, dated January 17, 2006, between the Company and ITN Energy Systems, Inc. (incorporated by reference to Exhibit 10.3 to our Registration Statement on Form SB-2 filed on January 23, 2006 (Reg. No. 333-131216))
10.4	License Agreement, dated January 17, 2006, between the Company and ITN Energy Systems, Inc. (incorporated by reference to Exhibit 10.4 to our Registration Statement on Form SB-2 filed on January 23, 2006 (Reg. No. 333-131216)) CTR
10.5	Letter Agreement, dated November 23, 2005, among the Company, ITN Energy Systems, Inc. and the University of Delaware (incorporated by reference to Exhibit 10.16 to our Registration Statement on Form SB-2/A filed on May 26, 2006 (Reg. No. 333-131216))
10.6	License Agreement, dated November 21, 2006, between the Company and UD Technology Corporation (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed on November 29, 2006) CTR
10.7	Novation Agreement, dated January 1, 2007, among the Company, ITN Energy Systems, Inc. and the United States Government (incorporated by reference to Exhibit 10.23 to our Annual Report on Form 10-KSB for the year ended December 31, 2006)
10.8	Construction Loan Agreement, dated February 8, 2008, between the Company and the Colorado Housing and Finance Authority (incorporated by reference to Exhibit 10.37 to our Annual Report on Form 10-K for the year ended December 31, 2007)
10.9	Promissory Note, dated February 8, 2008, issued to the Colorado Housing and Finance Authority (incorporated by reference to Exhibit 10.38 to our Annual Report on Form 10-K for the year ended December 31, 2007)
10.10	Loan Modification Agreement, dated January 29, 2009, between the Company and the Colorado Housing and Finance Authority (incorporated by reference to Exhibit 10.52 to our Annual Report on Form 10-K for the year ended December 31, 2008)
10.11†	Executive Employment Agreement, dated April 4, 2014, between the Company and Victor Lee (filed as Exhibit 10.1 to our Current Report on Form 8-K filed on April 9, 2014) †
10.12	Series E Securities Purchase Agreement, dated November 4, 2015, between the Company and Redwood Management, LLC Ltd (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed November 10, 2015)

Exhibit No.	Description
10.13	Series E Registration Rights Agreement, dated November 4, 2015, between the Company and Redwood Management, LLC (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed November 10, 2015)
10.14	Equity Line Purchase Agreement dated November 10, 2015 (incorporated by reference to Exhibit 10.3 to our Current Report on Form 8-K filed November 10, 2015)
10.15	Equity Line Registration Rights Agreement dated November 10, 2015 (incorporated by reference to Exhibit 10.4 to our Current Report on Form 8-K filed November 10, 2015)
10.16	Series F Securities Purchase Agreement, dated January 19, 2016, between the Company and Redwood Management, LLC Ltd (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed January 20, 2016)
10.17	Right to Receive Common Stock dated April 29, 2016 (incorporated by reference to Exhibit 10.3 to our Current Report on Form 8-K filed May 2, 2016)
10.18	Right to Receive Common Stock dated April 29, 2016 (incorporated by reference to Exhibit 10.4 to our Current Report on Form 8-K filed May 2, 2016)
10.19	Series G Securities Purchase Agreement dated April 29, 2016 (incorporated by reference to Exhibit 10.5 to our Current Report on Form 8-K filed May 2, 2016)
10.20	Series G Securities Purchase Agreement dated April 29, 2016 (incorporated by reference to Exhibit 10.6 to our Current Report on Form 8-K filed May 2, 2016)
10.21	Series H Securities Purchase Agreement dated June 9, 2016 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed June 9, 2016)
10.22	Series H Registration Rights Agreement dated June 9, 2016 (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed June 9, 2016)
10.23†	Seventh Amended and Restated 2005 Stock Option Plan (incorporated by reference to Annex C of our definitive proxy statement dated April 22, 2016)†
10.24†	Seventh Amended and Restated 2008 Restricted Stock Plan Stock Option Plan Plan (incorporated by reference to Annex B of our definitive proxy statement dated April 22, 2016)†
10.25	Series I Securities Purchase Agreement dated July 26, 2016 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed July 28, 2016)
10.26	Form of 10% Convertible Note (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed September 14, 2016)
10.27	Exchange Agreement dated September 13, 2016 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed September 14, 2016)

Exhibit No.	Description
10.28	Series J Securities Purchase Agreement dated September 19, 2016 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed September 23, 2016)
10.29	Securities Purchase Agreement for Notes dated October 5, 2016 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed October 11, 2016)
10.30	Note due December 5, 2016 (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed October 11, 2016)
10.31	Note due January 3, 2017 (incorporated by reference to Exhibit 10.3 to our Current Report on Form 8-K filed October 11, 2016)
10.32	Note due February 3, 2017 (incorporated by reference to Exhibit 10.4 to our Current Report on Form 8-K filed October 11, 2016)
10.33	Exchange Agreement dated October 5, 2016 (incorporated by reference to Exhibit 10.5 to our Current Report on Form 8-K filed October 11, 2016)
10.34	Series J-1 Securities Purchase Agreement dated October 14, 2016 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed October 20, 2016)
10.35	Note dated December 2, 2016 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed December 8, 2016)
10.36	Note dated December 6, 2016 (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed December 8, 2016)
10.37	Note dated December 13, 2016 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed December 19, 2016)
10.38	Note dated December 30, 2016 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed January 6, 2017)
10.39	Note dated January 10, 2017 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed January 17, 2017)
10.40	\$300,000 Note dated January 16, 2017 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed January 20, 2017)
10.41	\$700,000 Note dated January 17, 2017 (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed January 20, 2017)
10.42	Securities Purchase Agreement dated January 19, 2017 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed January 24, 2017)

Exhibit No.	Description
10.43	Note dated February 7, 2017 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed February 9, 2017)
10.44	Series K Securities Purchase Agreement dated February 8, 2017 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed February 14, 2017)
10.45	Note dated February 13, 2017 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed February 17, 2017)
10.46	\$400,000 Note dated February 27, 2017 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed March 1, 2017)
10.47	Intellectual Property Disposal Agreement dated as of January 25, 2017 and effective February 23, 2017 (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed March 1, 2017)
10.48	Note dated March 13, 2017 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed March 17, 2017)
10.49	Note dated March 24, 2017 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed March 29, 2017)
10.50	Note dated April 6, 2017 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed April 7, 2017)
10.51	Note dated April 21, 2017 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed April 24, 2017)
10.52	Forbearance and Settlement Agreement dated May 5, 2017 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed May 10, 2017)
10.53	Note dated May 8, 2017 (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed May 10, 2017)
10.54	Form of Warrant (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed July 27, 2017)
10.55	Form of Warrant (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed August 11, 2017)
10.56	Securities Purchase Agreement dated September 8, 2017 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed September 14, 2017)
10.57	Note dated September 11, 2017 (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed September 14, 2017)

Exhibit No.	Description
10.58	Promissory Note Exchange Agreement dated September 13, 2017 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed September 20, 2017)
10.59	Note dated September 13, 2017 (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed September 20, 2017)
10.60	Note dated October 31, 2017 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed November 8, 2017)
10.61	Note dated November 16, 2017 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed November 22, 2017)
10.62	Note Purchase and Exchange Agreement dated November 30, 2017 (incorporated by reference to Exhibit 10.62 to our Annual Report on Form 10-K filed March 29, 2018)
10.63	Form of Secured Convertible Promissory Note - 36 month maturity (incorporated by reference to Exhibit 10.63 to our Annual Report on Form 10-K filed March 29, 2018)
10.64	Form of Secured Convertible Promissory Note - 12 month maturity (incorporated by reference to Exhibit 10.64 to our Annual Report on Form 10-K filed March 29, 2018)
10.65	Security Agreement dated November 30, 2017 (incorporated by reference to Exhibit 10.65 to our Annual Report on Form 10-K filed March 29, 2018)
10.66	Series J Securities Exchange Agreement dated December 6, 2017 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed December 12, 2017)
10.67	Note dated December 6, 2017 (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed December 12, 2017)
10.68	Warrant dated December 15, 2017 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed December 20, 2017)
10.69	Unsecured Promissory Note dated January 31, 2018 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed February 2, 2018)
10.70	Unsecured Promissory Note dated January 31, 2018 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed February 2, 2018)
10.71	Amendment of Outstanding Convertible Notes dated May 1, 2018 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed May 7, 2018)
10.72	Securities Purchase Agreement dated May 8, 2018 (incorporated by reference to Exhibit 10.1 to our Quarterly Report on Form 10-Q filed August 20, 2018)

Exhibit No.	Description
10.73	Secured Convertible Note dated May 8, 2018 (incorporated by reference to Exhibit 10.2 to our Quarterly Report on Form 10-Q filed August 20, 2018)
10.74	Unsecured Promissory Note dated June 6, 2018 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed June 12, 2018)
10.75	Secured Promissory Note dated July 6, 2018 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed July 12, 2018)
10.76	Unsecured Promissory Note dated July 24, 2018 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed July 30, 2018)
10.77	Exchange Agreement dated July 25, 2018 (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed on July 30, 2018)
10.78	Unsecured Convertible Exchange Note dated July 25, 2018 (incorporated by reference to Exhibit 10.3 to our Current Report on Form 8-K filed on July 30, 2018)
10.79	Securities Purchase Agreement dated August 1, 2018 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed on August 8, 2018)
10.80	Convertible Promissory Note dated August 1, 2018 (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed on August 8, 2018)
10.81	Securities Purchase Agreement dated August 29, 2018 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed on September 10, 2018)
10.82	Convertible Promissory Note dated August 29, 2018 (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed on September 10, 2018)
10.83	Securities Purchase Agreement dated September 4, 2018 (incorporated by reference to Exhibit 10.3 to our Current Report on Form 8-K filed on September 10, 2018)
10.84	Convertible Promissory Note dated September 4, 2018 (incorporated by reference to Exhibit 10.4 to our Current Report on Form 8-K filed on September 10, 2018)
10.85	Exchange Agreement dated September 7, 2018 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed on September 13, 2018)
10.86	Convertible Promissory Note dated September 7, 2018 (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed on September 13, 2018)
10.87	Non-Convertible Promissory Note dated September 10, 2018 (incorporated by reference to Exhibit 10.3 to our Current Report on Form 8-K filed on September 13, 2018)

Exhibit No.	Description
10.88	Convertible Promissory Note dated September 14, 2018 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed on September 20, 2018)
10.89	Secured Convertible Promissory Note dated October 2, 2018 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed on October 9, 2018)
10.90	Securities Purchase Agreement dated October 16, 2018 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed on October 23, 2018)
10.91	Convertible Promissory Note dated October 16, 2018 (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed on October 23, 2018)
10.92	Secured Promissory Note dated October 22, 2018 (incorporated by reference to Exhibit 10.3 to our Current Report on Form 8-K filed on October 23, 2018)
10.93	Securities Purchase Agreement dated November 5, 2018 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed on November 14, 2018)
10.94	Convertible Promissory Note dated November 5, 2018 (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed on November 14, 2018)
10.95	Investor Notes (Numbered 1 through 8) each dated November 5, 2018 (incorporated by reference to Exhibit 10.3 to our Current Report on Form 8-K filed on November 14, 2018)
10.96	Non-Convertible Promissory Note Dated December 31, 2018 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed on January 3, 2019)
10.97	Unsecured Promissory Note dated January 11, 2019 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed on January 15, 2019)
10.98*	Securities Purchase Agreement Dated February 14, 2019*
10.99*	Convertible Promissory Note Dated February 14, 2019*
10.100	GS Capital Partners Convertible Redeemable Note (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed on February 28, 2019)
10.101	GS Capital Partners Securities Purchase Agreement (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed on February 28, 2019)
10.102	Securities Purchase Agreement Dated March 7, 2019 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed on March 13, 2019)

Exhibit No.	Description
10.103	Convertible Promissory Note Dated March 7, 2019 (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed on March 13, 2019)
10.104	Exchange Agreement I Dated March 11, 2019 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed on March 15, 2019)
10.105	Convertible Promissory Note Dated March 11, 2019 (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed on March 15, 2019)
10.106	Exchange Agreement II Dated March 11, 2019 (incorporated by reference to Exhibit 10.3 to our Current Report on Form 8-K filed on March 15, 2019)
10.107	Convertible Promissory Note Dated March 11, 2019 (incorporated by reference to Exhibit 10.4 to our Current Report on Form 8-K filed on March 15, 2019)
10.108	Non-Convertible Promissory Note Dated March 11, 2019 (incorporated by reference to Exhibit 10.5 to our Current Report on Form 8-K filed on March 15, 2019)
10.109	Securities Purchase Agreement Dated March 13, 2019 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed on March 22, 2019)
10.110	Secured Convertible Promissory Note Dated March 13, 2019 (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed on March 22, 2019)
23.1	Consent of Haynie & Company*
31.1	Chief Executive Officer Certification pursuant to section 302 of the Sarbanes-Oxley Act of 2002*
31.2	Chief Financial Officer Certification pursuant to section 302 of the Sarbanes-Oxley Act of 2002*
32.1	Chief Executive Officer Certification pursuant to section 906 of the Sarbanes-Oxley Act of 2002*
32.2	Chief Financial Officer Certification pursuant to section 906 of the Sarbanes-Oxley Act of 2002*
101.INS	XBRL Instance Document*
101.SCH	XBRL Taxonomy Extension Schema Document*

Exhibit No.	Description
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document*
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document*
101.LAB	XBRL Taxonomy Extension Label Linkbase Document*
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document*
*	Filed herewith
CTR	Portions of this exhibit have been omitted pursuant to a request for confidential treatment.
†	Denotes management contract or compensatory plan or arrangement.

Item 16. Form 10-K Summary

None.

SIGNATURES

ASCENT SOLAR TECHNOLOGIES, INC.

By: /S/ VICTOR L EE
Lee Kong Hian (aka Victor Lee)
President and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant in the capacities and on the dates indicated.

Signature	Capacities	Date
<div>/S/ VICTOR LEE</div> <div>Lee Kong Hian (aka Victor Lee)</div>	<div>President & Chief Executive Officer and a Director</div> <div>(principal executive officer, and principal financial officer and accounting officer)</div>	<div>April 16, 2019</div>
<div>/S/ AMIT KUMAR</div> <div>Amit Kumar, Ph.D.</div>	<div>Chairman of the Board of Directors</div>	<div>April 16, 2019</div>
<div>/S/ G. THOMAS MARSH</div> <div>G. Thomas Marsh</div>	<div>Director</div>	<div>April 16, 2019</div>
<div>/S/ KIM J. HUNTLEY</div> <div>Kim J. Huntley</div>	<div>Director</div>	<div>April 16, 2019</div>

Ascent Solar Technologies, Inc.
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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and
Stockholders of Ascent Solar Technologies, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Ascent Solar Technologies, Inc. (the Company) as of December 31, 2018 and 2017, and the related consolidated statements of operations, stockholders' deficit, and cash flows for each of the years in the two year period ended December 31, 2018, and the related notes (collectively referred to as the financial statements). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017 and , and the results of its operations and its cash flows for the years ended December 31, 2018 and 2017, in conformity with accounting principles generally accepted in the United States of America.

Consideration of the Company's Ability to Continue as a Going Concern

The accompanying financial statements have been prepared assuming that the Company will continue as a going concern. As more fully described in Note 4 to the financial statements, the Company has recurring losses, negative working capital and negative cash flows from operations. These factors raise substantial doubt about the Company's ability to continue as a going concern. Management's plans in regard to these matters are also described in Note 4 to the financial statements. The financial statements do not include any adjustments that might result from the outcome of this uncertainty. If the Company is unable to obtain financing or increase sales, there could be a material adverse effect on the Company.

Basis for Opinion

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

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

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

/s/ Haynie and Company

We have served as the Company's auditor since 2017
Littleton, Colorado
April 16, 2019

ASCENT SOLAR TECHNOLOGIES, INC.

CONSOLIDATED BALANCE SHEETS

	December 31, 2018	December 31, 2017
ASSETS (substantially pledged)		
Current Assets:		
Cash and cash equivalents	\$ 18,159	\$ 89,618
Trade receivables, net of allowance of \$45,664 and \$48,201, respectively	165,160	6,658
Inventories, net	660,791	1,037,854
Prepaid expenses and other current assets	138,369	494,425
Total current assets	982,479	1,628,555
Property, Plant and Equipment:	36,621,187	36,645,862
Less accumulated depreciation and amortization	(32,207,829)	(32,013,686)
	4,413,358	4,632,176
Other Assets:		
Patents, net of accumulated amortization of \$363,533 and \$430,071, respectively	862,429	1,470,796
Other non-current assets	34,061	49,813
	896,490	1,520,609
Total Assets	\$ 6,292,327	\$ 7,781,340
LIABILITIES AND STOCKHOLDERS' DEFICIT		
Current Liabilities:		
Accounts payable	\$ 2,318,655	\$ 1,600,455
Related party payables	270,740	202,827
Accrued expenses	1,562,435	1,180,161
Accrued interest	1,198,279	443,587
Notes payable	1,516,530	1,570,231
Current portion of long-term debt	349,093	343,395
Secured promissory notes, net of discount of \$2,824,365 and \$3,618,571, respectively	3,447,380	938,656
Promissory notes, net of discount of \$104,583 and \$20,626, respectively	1,239,854	948,811
Convertible notes, net of discount of \$394,011 and \$1,238,241, respectively	1,852,722	1,362,592
Embedded derivative liability	10,114,452	6,406,833
Total current liabilities	23,870,140	14,997,548
Long-term debt, net of current portion	5,028,969	5,118,424
Accrued Warranty Liability	29,114	57,703
Total Liabilities	28,928,223	20,173,675
Redeemable Preferred Stock:		
Series K preferred stock: 20,000 shares authorized as of December 31, 2018 and December 31, 2017; zero and 2,810 issued and outstanding as of December 31, 2018 and December 31, 2017, respectively	—	2,810,000
Commitments and Contingencies	—	—
Stockholders' Deficit:		
Series A preferred stock, \$.0001 par value; 750,000 shares authorized; 60,756 shares issued and outstanding as of December 31, 2018 and December 31, 2017 (\$822,620 and \$761,864 Liquidation Preference, respectively)	6	6
Common stock, \$.0001 par value, 20,000,000,000 shares authorized as of December 31, 2018 and December 31, 2017; 63,537,885 and 9,606,677 shares issued and outstanding as of December 31, 2018 and December 31, 2017, respectively	6,354	960,660
Additional paid in capital	395,889,712	386,332,475
Accumulated deficit	(418,531,968)	(402,495,476)
Total stockholders' deficit	(22,635,896)	(15,202,335)
Total Liabilities and Stockholders' Deficit	\$ 6,292,327	\$ 7,781,340

The accompanying notes are an integral part of these consolidated financial statements.

ASCENT SOLAR TECHNOLOGIES, INC.

CONSOLIDATED STATEMENTS OF OPERATIONS

	For the Years Ended December 31,	
	2018	2017
Revenues	\$ 862,412	\$ 642,179
Costs and Expenses		
Cost of revenues (exclusive of depreciation shown below)	1,015,796	2,814,782
Research, development and manufacturing operations (exclusive of depreciation shown below)	2,794,641	4,820,536
Selling, general and administrative (exclusive of depreciation shown below)	3,244,793	5,598,004
Depreciation and amortization	377,306	1,193,535
Inventory impairment loss	—	363,377
Total Costs and Expenses	7,432,536	14,790,234
Loss from Operations	(6,570,124)	(14,148,055)
Other Income/(Expense)		
Other Income/(Expense), net	13,144	574,817
Interest Expense	(7,351,681)	(6,518,747)
Deemed interest expense on warrant liability	—	(345,774)
Change in fair value of derivatives and gain/(loss) on extinguishment of liabilities, net	(2,127,831)	1,877,629
Total Other Income/(Expense)	(9,466,368)	(4,412,075)
Net Loss	\$ (16,036,492)	\$ (18,560,130)
Net Loss Per Share (Basic and diluted)	\$ (0.69)	\$ (3.15)
Weighted Average Common Shares Outstanding (Basic and diluted)	23,157,607	5,883,375

The accompanying notes are an integral part of these consolidated financial statements.

ASCENT SOLAR TECHNOLOGIES, INC.

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY (DEFICIT)

	Common Stock		Series A Preferred Stock		Additional Paid-In Capital	Accumulated Deficit	Total Stockholders' Equity
	Shares	Amount	Shares	Amount			
Balance, December 31, 2016	554,302	\$ 55	125,044	\$ 13	\$ 369,941,432	\$ (383,932,576)	(13,991,076)
Interest and Dividend Expense paid with Common Stock	332,007	33			246,551		246,584
Issuance of Restricted Stock	40	—			—		—
Commitment Shares	37,500	4			63,746		63,750
Conversion of Series A Preferred Stock into Common Shares, plus make-whole	131,089	13	(64,288)	(7)	257,146		257,152
Conversion of Series E Preferred Stock into Common Shares	247,372	25			119,975		120,000
Conversion of Series F Preferred Stock into Common Shares	189,780	19			126,981		127,000
Conversion of Series G Preferred Stock into Common Shares	1,529,316	153			897,847		898,000
Conversion of Series I Convertible Notes into Common Shares	419,720	42			226,029		226,071
Conversion of Series J Preferred Stock into Common Shares	365,646	37			274,963		275,000
Conversion of Series J-1 Preferred Stock into Common Shares	466,667	47			699,953		700,000
Conversion of Series K Preferred Stock into Common Shares	1,550,000	155			6,199,845		6,200,000
Conversion of July 2016 Convertible Notes into Common Shares	2,808,249	281			1,699,686		1,699,967
Conversion of TFG note into Common Shares	333,333	33			544,648		544,681
Conversion of BayBridge Note into Common Shares	473,405	47			377,952		377,999
Conversion of Global Ichiban Note into Common Shares	168,251	17			163,491		163,508
Loss on Extinguishment of Liabilities					4,481,939		4,481,939
Induced Conversion Costs					500,948		500,948
Warrant Expense					345,774		345,774
Stock based compensation					123,268		123,268
Prior period adjustment - subsidiary						(2,770)	(2,770)
Net Loss						(18,560,130)	(18,560,130)
Balance, December 31, 2017	9,606,677	\$ 961	60,756	\$ 6	\$ 387,292,174	\$ (402,495,476)	\$ (15,202,335)
Interest and Dividend Expense paid with Common Stock	1,137,349	114			62,800		62,914
Conversion of St. George Note into Common Shares	15,849,656	1,585			605,015		606,600
Conversion of Global Ichiban Note into Common Shares	3,486,274	349			1,425,651		1,426,000
Conversion of BayBridge Note into Common Shares	19,838,979	1,984			770,517		772,501
Conversion of Bellridge Note into Common Shares	10,912,281	1,091			243,909		245,000
Conversion of Note Payable into Common Shares	2,004,169	200			356,542		356,742
Conversion of Series K Preferred Stock into Common Shares	702,500	70			2,809,930		2,810,000
Loss on Extinguishment of Liabilities					2,293,909		2,293,909
Stock based compensation					29,265		29,265
Net Loss						(16,036,492)	(16,036,492)
Balance, December 31, 2018	63,537,885	\$ 6,354	60,756	\$ 6	\$ 395,889,712	\$ (418,531,968)	\$ (22,635,896)

The accompanying notes are an integral part of these consolidated financial statements.

ASCENT SOLAR TECHNOLOGIES, INC.

CONSOLIDATED STATEMENTS OF CASH FLOWS

	For the Years Ended	
	December 31,	
	2018	2017
Operating Activities:		
Net loss	\$ (16,036,492)	\$ (18,560,130)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	381,056	1,197,285
Stock based compensation	29,265	123,268
Realized loss (gain) on sale of assets	(14,000)	(1,210,331)
Amortization of financing costs	29,167	76,351
Non-cash interest expense	704,968	643,263
Amortization of debt discount	5,198,003	4,427,086
Bad debt expense	(2,536)	514
Accrued litigation settlement	—	(339,481)
Warrant expense	—	345,774
Impairment of inventory	—	363,377
Write off Enerplex Patents	467,005	—
Warranty reserve	(28,589)	(118,754)
Change in fair value of derivatives and loss on extinguishment of liabilities, net	2,127,831	(1,877,629)
Induced conversion expense	—	635,514
Changes in operating assets and liabilities:		
Accounts receivable	(155,966)	569,632
Inventories	377,063	1,168,585
Prepaid expenses and other current assets	383,475	389,910
Accounts payable	994,418	(592,403)
Related party payable	67,913	(12,076)
Accrued expenses	1,083,727	11,502
Accrued interest	377,846	160,814
Net cash used in operating activities	(4,015,846)	(12,597,929)
Investing Activities:		
Purchase of property, plant and equipment	—	(6,402)
Proceeds from sale of assets	14,000	150,000
Patent activity costs	(16,447)	(62,652)
Net cash provided by (used in) investing activities	(2,447)	80,946
Financing Activities:		
Proceeds from debt	4,103,500	5,542,500
Repayment of debt	(145,666)	(2,056,845)
Payment of debt financing costs	(11,000)	(20,000)
Proceeds from issuance of stock and warrants	—	9,010,000
Net cash provided by financing activities	3,946,834	12,475,655
Net change in cash and cash equivalents	(71,459)	(41,328)
Cash and cash equivalents at beginning of period	89,618	130,946
Cash and cash equivalents at end of period	\$ 18,159	\$ 89,618
Supplemental Cash Flow Information:		
Cash paid for interest	\$ 237,681	\$ 1,221,843
Cash paid for income taxes	\$ —	\$ —
Non-Cash Transactions:		
Non-cash conversions of preferred stock and convertible notes to equity	\$ 6,216,842	\$ 11,835,962
Non-cash conversions of preferred stock to notes payable	\$ —	\$ 1,075,000

Make-whole provision on convertible preferred stock	\$ —	\$ 257,152
Non-cash financing costs	\$ 45,000	\$ 2,500
Debt converted to accounts payable	\$ —	\$ 55,067
Accounts payable converted to notes payable	\$ 308,041	\$ 1,587,760
Accounts payable forgiven related to sale of EnerPlex	\$ —	\$ 1,031,726
Interest converted to principal	\$ 140,518	\$ 431,195
Common shares issued for commitment fee	\$ —	\$ 63,750
Initial embedded derivative liabilities	\$ 3,873,697	\$ 5,878,345
Promissory notes converted to convertible notes	\$ 475,000	\$ —

The accompanying notes are an integral part of these consolidated financial statements.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS**NOTE 1. ORGANIZATION**

Ascent Solar Technologies, Inc. (“Ascent”) was incorporated on October 18, 2005 from the separation by ITN Energy Systems, Inc. (“ITN”) of its Advanced Photovoltaic Division and all of that division’s key personnel and core technologies. ITN, a private company incorporated in 1994, is an incubator dedicated to the development of thin film, photovoltaic (“PV”), battery, fuel cell and nano technologies. Through its work on research and development contracts for private and governmental entities, ITN developed proprietary processing and manufacturing know how applicable to PV products generally, and to Copper-Indium-Gallium-diSelenide (“CIGS”) PV products in particular. ITN formed Ascent to commercialize its investment in CIGS PV technologies. In January 2006, in exchange for 102,800 shares of common stock of Ascent, ITN assigned to Ascent certain CIGS PV technologies and trade secrets and granted to Ascent a perpetual, exclusive, royalty free worldwide license to use, in connection with the manufacture, development, marketing and commercialization of CIGS PV to produce solar power, certain of ITN’s existing and future proprietary and control technologies that, although non-specific to CIGS PV, Ascent believes will be useful in its production of PV modules for its target markets. Upon receipt of the necessary government approvals and pursuant to novation in early 2007, ITN assigned government funded research and development contracts to Ascent and also transferred the key personnel working on the contracts to Ascent.

Currently, the Company is focusing on integrating its PV products into high value markets such as aerospace, satellites, near earth orbiting vehicles, and fixed-wing unmanned aerial vehicles (UAV). The value proposition of Ascent’s proprietary solar technology not only aligns with the needs of customers in these industries, but also overcomes many of the obstacles other solar technologies face in these unique markets. Ascent has the capability to design and develop finished products for end users in these areas as well as collaborate with strategic partners to design and develop custom integrated solutions for products like fixed-wing UAVs. Ascent sees significant overlap of the needs of end users across some of these industries and can achieve economies of scale in sourcing, development, and production in commercializing products for these customers.

Reverse Stock Split

On July 19, 2018, the Company, filed a Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the Company (the “Certificate of Amendment”) with the Secretary of State of the State of Delaware to effect a reverse stock split of the Company’s common stock, at a ratio of one-for-one thousand (the “Reverse Stock Split”).

The Certificate of Amendment provides that the Reverse Stock Split became effective as of 5:00 p.m. Eastern Time on July 20, 2018 (the “Effective Time”), at which time every thousand shares of the Company’s issued and outstanding Common Stock were automatically combined into one issued and outstanding share of Common Stock, without any change in the par value per share. The Certificate of Amendment provides that in the event a stockholder would otherwise be entitled to receive a fraction of a share of Common Stock, such stockholder shall receive one whole share of Common Stock in lieu of such fractional share and no fractional shares shall be issued.

NOTE 2. BASIS OF PRESENTATION

The accompanying consolidated financial statements have been derived from the accounting records of Ascent Solar Technologies, Inc., Ascent Solar (Asia) Pte. Ltd., and Ascent Solar (Shenzhen) Co., Ltd. (collectively, “the Company”) as of December 31, 2018 and December 31, 2017, and the results of operations for the years ended December 31, 2018 and 2017. Ascent Solar (Shenzhen) Co., Ltd. is wholly owned by Ascent Solar (Asia) Pte. Ltd., which is wholly owned by Ascent Solar Technologies, Inc. All significant inter-company balances and transactions have been eliminated in the accompanying consolidated financial statements.

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

NOTE 3. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Cash Equivalents: The Company classifies all short-term investments in interest bearing bank accounts and highly liquid debt securities purchased with an original maturity of three months or less to be cash equivalents. The Company maintains cash balances which may exceed federally insured limits. The Company does not believe this results in significant credit risk.

Foreign Currencies: Bank account balances held in foreign currencies are translated to U.S. dollars utilizing the period end exchange rate. Gains or losses incurred in connection with the Company's accounts held in foreign currency were not material for the years ended December 31, 2018 and 2017 and were recorded in "Other Income/(Expense)" in the Consolidated Statements of Operations.

Receivables and Allowance for Doubtful Accounts: Trade accounts receivable are recorded at the invoiced amount as the result of transactions with customers. The Company maintains allowances for doubtful accounts for estimated losses resulting from the inability of its customers to make required payments. The Company estimates the collectability of accounts receivable using analysis of historical bad debts, customer credit-worthiness and current economic trends. Reserves are established on an account-by-account basis. Account balances are written off against the allowance in the period in which the Company determines that it is probable that the receivable will not be recovered. As of December 31, 2018 and 2017, the Company had an allowance for doubtful accounts of \$45,664 and \$48,201, respectively.

Inventories: All inventories are stated at the lower of cost or net realizable value, with cost determined using the weighted average method. Inventory balances are frequently evaluated to ensure they do not exceed net realizable value. The computation for net realizable value takes into account many factors, including expected demand, product life cycle and development plans, module efficiency, quality issues, obsolescence and others. Management's judgment is required to determine reserves for obsolete or excess inventory. As of December 31, 2018 and 2017, the Company had inventory reserve balances of \$745,927 and \$562,140, respectively. In response to management's estimate of current market conditions, the Company has reserved all of its work-in-process and finished goods inventory as of December 31, 2018. If actual demand and market conditions are less favorable than those estimated by management, additional inventory write downs may be required.

Due to the sale of the EnerPlex brand and the re-purposing of our work-in-process inventory, we are unable to estimate the recoverability of all of our work-in-process inventory values, resulting in a lower-cost-to-market analysis and reserve for impairment. An expense of \$363,377 was recorded to inventory impairment costs for the year ended December 31, 2017. There were no lower of cost or market adjustments during the year ended December 31, 2018.

Property, Plant and Equipment: Property, plant and equipment are recorded at the original cost to the Company. Assets are being depreciated over estimated useful lives of three to forty years using the straight-line method, as presented in the table below, commencing when the asset is placed in service. Leasehold improvements are depreciated over the shorter of the remainder of the lease term or the life of the improvements. Upon retirement or disposal, the cost of the asset disposed of and the related accumulated depreciation are removed from the accounts and any gain or loss is reflected in income. Expenditures for repairs and maintenance are expensed as incurred.

	Useful Lives in Years
Buildings	40
Manufacturing machinery and equipment	5 - 10
Furniture, fixtures, computer hardware/software	3 - 7
Leasehold improvements	life of lease

Patents: At such time as the Company is awarded patents, patent costs are amortized on a straight-line basis over the legal life on the patents, or over their estimated useful lives, whichever is shorter. During the year ended December 31, 2018, the Company wrote down the remaining international EnerPlex IP, which was not part of the 2017 sale of the EnerPlex IP. This write down consisted of \$692,032 in capitalized patent costs, reduced by \$225,027 in accumulated amortization, resulting in an expense of \$467,005. As of December 31, 2018 and 2017, the Company had \$862,429 and \$1,470,796 of net patent costs, respectively. Of these amounts \$207,308 and \$640,167 represents costs net of amortization incurred for awarded patents, and the remaining \$655,121 and \$830,629 represents costs incurred for patent applications to be filed as of December 31, 2018 and 2017, respectively. During the years ended December 31, 2018 and 2017, the Company capitalized \$16,447 and \$62,652 in patent costs, respectively, as it worked to secure design rights and trademarks for newly developed products. Amortization expense was \$158,488 and \$150,928 for the years ended December 31, 2018 and 2017, respectively.

ASCENT SOLAR TECHNOLOGIES, INC.

As of December 31, 2018, future amortization of patents is expected as follows:

	2019 \$	57,649
	2020 \$	45,920
	2021 \$	37,429
	2022 \$	33,924
	2023 \$	25,154
Thereafter	\$	7,232
	\$	207,308

Impairment of Long-lived Assets: The Company analyzes its long-lived assets (property, plant and equipment) and definitive-lived intangible assets (patents) for impairment, both individually and as a group, whenever events or changes in circumstances indicate the carrying amount of the assets may not be recoverable. Events that might cause impairment would include significant current period operating or cash flow losses associated with the use of a long-lived asset or group of assets combined with a history of such losses, significant changes in the manner of use of assets and significant negative industry or economic trends. An undiscounted cash flow analysis is calculated to determine if impairment exists. If impairment is determined to exist, any related loss is calculated using the difference between the fair value and the carrying value of the assets. During the years ended December 31, 2018 and 2017, the Company did not incur impairments of its manufacturing facilities and equipment.

Interest Capitalization : Historically the Company has capitalized interest cost as part of the cost of acquiring or constructing certain assets during the period of time required to get the asset ready for its intended use. The Company capitalized interest to the extent that expenditures to acquire or construct an asset have occurred and interest cost has been incurred.

Convertible Notes : The Company issues, from time to time, convertible notes. Refer to Notes 10 and 12 for further information.

Convertible Preferred Stock: The Company evaluates its preferred stock instruments under FASB ASC 480, "*Distinguishing Liabilities from Equity*" to determine the classification, and thereby the accounting treatment, of the instruments. Refer to Notes 13 and 14 for further discussion on the classification of each instrument.

Derivatives: The Company evaluates its financial instruments under FASB ASC 815, "*Derivatives and Hedging*" to determine whether the instruments contain an embedded derivative. When an embedded derivative is present, the instrument is evaluated for a fair value adjustment upon issuance and at the end of every reporting period. Any adjustments to fair value are treated as gains and losses in fair values of derivatives and are recorded in the Consolidated Statements of Operations.

The following table is a summary of the derivative liability activity for the years ended December 31, 2018 :

Derivative Liability Balance as of December 31, 2017	\$	6,406,833
Additional derivative liability on new notes		3,873,697
Derivative liability extinguished		(27,686)
Change in fair value of derivative liability		(138,392)
Derivative Liability Balance as of December 31, 2018	\$	10,114,452

Refer to Notes 10 and 12 for further discussion on the embedded derivatives of each instrument.

Product Warranties: The Company provides a limited warranty to the original purchaser of products against defective materials and workmanship. The Company also guarantees that standalone modules and PV integrated consumer electronics will achieve and maintain the stated conversion efficiency rating for certain products. Warranty accruals are recorded at the time of sale and are estimated based upon product warranty terms, historical experience and analysis of peer company product returns. The Company assesses the adequacy of its liabilities and makes adjustments as necessary based on known or anticipated warranty claims, or as new information becomes available.

Warrant Liability: Warrants to purchase the Company's common stock with nonstandard anti-dilution provisions, regardless of the probability or likelihood that may conditionally obligate the issuer to ultimately transfer assets, are classified as liabilities and are recorded at their estimated fair value at each reporting period. Any change in fair value of these warrants is recorded at each reporting period in Other income/(expense) on the Company's statement of operations.

Revenue Recognition:

Product revenue. We recognize revenue for module and other equipment sales at a point in time following the transfer of control of such products to the customer, which typically occurs upon shipment or delivery depending on the terms of the underlying contracts. For module and other equipment sales contracts that contain multiple performance obligations, we allocate the transaction price to each performance obligation identified in the contract based on relative standalone selling prices, or estimates of such prices, and recognize the related revenue as control of each individual product is transferred to the customer, in satisfaction of the corresponding performance obligations.

During the years ended December 31, 2018 and 2017, the company recognized product revenue of \$813,512 and \$642,179, respectively.

Government contracts revenue. Revenue from government research and development contracts is generated under terms that are cost plus fee or firm fixed price. We generally recognize this revenue over time using cost based input methods, which recognize revenue and gross profit as work is performed based on the relationship between actual costs incurred compared to the total estimated costs of the contract. In applying cost based input methods of revenue recognition, we use the actual costs incurred relative to the total estimated costs to determine our progress towards contract completion and to calculate the corresponding amount of revenue to recognize.

Cost based input methods of revenue recognition are considered a faithful depiction of our efforts to satisfy long-term government research and development contracts and therefore reflect the performance obligations under such contracts. Costs incurred that do not contribute to satisfying our performance obligations are excluded from our input methods of revenue recognition as the amounts are not reflective of our transferring control under the contract. Costs incurred towards contract completion may include direct costs plus allowable indirect costs and an allocable portion of the fixed fee. If actual and estimated costs to complete a contract indicate a loss, provision is made currently for the loss anticipated on the contract.

During the year ended December 31, 2018, the company recognized government contract revenue of \$48,900. No government contract revenue was recognized for the year ended December 31, 2017.

Shipping and Handling Costs: The Company classifies shipping and handling costs for products shipped to customers as a component of "Cost of revenues" on the Company's Consolidated Statements of Operations. Customer payments of shipping and handling costs are recorded as a component of Revenues.

Research, Development and Manufacturing Operations Costs: Research, development and manufacturing operations expenses were \$2,794,641 and \$4,820,536 for the years ended December 31, 2018 and 2017, respectively. Research, development and manufacturing operations expenses include: 1) technology development costs, which include expenses incurred in researching new technology, improving existing technology and performing federal government research and development contracts, 2) product development costs, which include expenses incurred in developing new products and lowering product design costs, and 3) pre-production and production costs, which include engineering efforts to improve production processes, material yields and equipment utilization, and manufacturing efforts to produce saleable product. Research, development and manufacturing operations costs are expensed as incurred, with the exception of costs related to inventoried raw materials, work-in-process and finished goods, which are expensed as Cost of revenue as products are sold.

Marketing and Advertising Costs: The Company advertises in print, television, online and through social media. The Company will also authorize customers to run advertising campaigns on its behalf through various media outlets. Marketing and advertising costs are expensed as incurred. Marketing and advertising expenses were \$23,560 and \$189,382 for the years ended December 31, 2018 and 2017, respectively.

Share-Based Compensation: The Company measures and recognizes compensation expense for all share-based payment awards made to employees, officers, directors, and consultants based on estimated fair values. The value of the portion of the award that is ultimately expected to vest is recognized as expense over the requisite service period in the Company's Statements of Operations. Share-based compensation is based on awards ultimately expected to vest and is reduced for estimated forfeitures. Forfeitures are estimated at the time of grant and revised, as necessary, in subsequent periods if actual forfeitures differ from those estimates. For purposes of determining estimated fair value of share-based payment awards on the date of grant the Company uses the Black-Scholes option-pricing model ("Black-Scholes Model") for option awards. The Black-Scholes Model requires the input of highly subjective assumptions. Because the Company's employee stock options may have characteristics significantly different from those of traded options, and because changes in the subjective input assumptions can materially affect the fair value estimate, in management's opinion, the existing models may not provide a reliable single measure of the fair value of the Company's employee stock options. Management will continue to assess the assumptions and methodologies used to calculate estimated fair value of share-based compensation. Circumstances may change and additional data may become available over time, which result in changes to these assumptions and methodologies, which could materially impact the Company's fair value determination. The Company estimates the fair value of its restricted stock awards as its stock price on the grant date.

The accounting guidance for share-based compensation may be subject to further interpretation and refinement over time. There are significant differences among option valuation models, and this may result in a lack of comparability with other companies that use different models, methods and assumptions. If factors change and the Company employs different assumptions in the accounting for share-based compensation in future periods, or if the Company decides to use a different valuation model, the compensation expense the Company records in the future may differ significantly from the amount recorded in the current period and could materially affect its loss from operations, net loss and net loss per share.

Income Taxes: Deferred income taxes are provided using the liability method whereby deferred tax assets are recognized for deductible temporary differences and operating loss and tax credit carry forwards and deferred tax liabilities are recognized for taxable temporary differences. Temporary differences are the differences between the reported amounts of assets and liabilities and their tax bases. Deferred tax assets are reduced by a valuation allowance when, in the opinion of management, it is more likely than not that some portion or all of the deferred tax assets will not be realized. Deferred tax assets and liabilities are adjusted for the effects of the changes in tax laws and rates as of the date of enactment. Interest and penalties, if applicable, would be recorded in operations.

The Company has analyzed filing positions in all of the federal and state jurisdictions where it is required to file income tax returns, as well as all open tax years (2014-2017) in these jurisdictions. The Company believes its income tax filing positions and deductions will be sustained on audit and does not anticipate any adjustments that will result in a material adverse effect on the Company's financial condition, results of operations, or cash flows. Therefore, no reserves for uncertain income tax positions have been recorded.

Net Loss per Common Share: Basic loss per share does not include dilution and is computed by dividing income available to common stockholders by the weighted average number of shares outstanding during the period. Diluted earnings per share reflect the potential securities that could share in the earnings of the Company, similar to fully diluted earnings per share. Common stock equivalents outstanding as of December 31, 2018 and 2017 of approximately 834 million and 3 million shares, respectively, have been omitted from loss per share because they are anti-dilutive. Common stock equivalents consist of stock options, preferred stock, preferred stock make-whole dividend liability amounts (assuming the make-whole dividend liability is paid in common stock in lieu of cash), and convertible notes (assuming the amortization payments are paid in common stock in lieu of cash). Net loss per common share was the same for both basic and diluted methods for the periods ended December 31, 2018 and 2017.

Fair Value Estimates: Fair value is defined as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. Valuation techniques used to measure fair value must maximize the use of observable inputs and minimize the use of unobservable inputs. The Company uses fair value hierarchy based on three levels of inputs, of which, the first two are considered observable and the last unobservable, to measure fair value:

- Level 1 - Quoted prices in active markets for identical assets or liabilities.
- Level 2 - Inputs other than Level 1 that are observable, either directly or indirectly, such as quoted prices for similar assets or liabilities; quoted prices in markets that are not active; or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities.
- Level 3 - Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

Certain long-lived assets and current liabilities have been measured at fair value on a recurring and non-recurring basis. See Note 6. Property, Plant and Equipment, Note 10. Secured Promissory Notes and Note 12. Convertible Notes. The carrying amount of our long term debt outstanding approximates fair value because our current borrowing rate does not materially differ from market rates for similar bank borrowings. The carrying value for cash and cash equivalents, restricted cash, accounts receivable, accounts payable, accrued expenses and other assets and liabilities approximate their fair values due to their short maturities.

Related Party Transactions: One of the Company's named shareholders is Tertius Financial Group Pte Ltd, of which Mr. Victor Lee, President and Chief Executive Officer of the Company, is Managing Director and 50% shareholder. Accounting for transactions under these agreements is consistent with those defined in our Significant Accounting Policies. See Note 19 for further information.

Use of Estimates: The preparation of financial statements in conformity with U.S. generally accepted accounting principles ("GAAP") requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Recently Issued Accounting Standards

In May 2014, the FASB issued ASU No. 2014-09, *Revenue from Contracts with Customers (Topic 606)*, and has issued a number of clarifying ASUs subsequently, all of which outline a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers and supersedes most current revenue recognition guidance, including industry-specific guidance. The core principle of the revenue model is that "an entity recognizes revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services." The standard provides enhancements to the quality and consistency of how revenue is reported by companies, while also improving comparability in the financial statements of companies reporting using International Financial Reporting Standards or U.S. GAAP. The new standard also will require enhanced revenue disclosures, provide guidance for transactions that were not previously addressed comprehensively, and improve guidance for multiple-element arrangements. This accounting standard becomes effective for the Company for reporting periods beginning after December 15, 2017, and interim reporting periods thereafter. Early adoption is permitted for annual reporting periods (including interim periods) beginning after December 15, 2016. This new standard permits the use of either the retrospective or cumulative effect transition method. The implementation of ASU 2014-09 did not have a material effect on the Company's consolidated financial statements.

In February 2016, the FASB issued ASU No. 2016-02, *Leases (Topic 842)*. ASU 2016-02 requires lessees to recognize all leases, including operating leases, on the balance sheet as a lease asset or lease liability, unless the lease is a short-term lease. ASU 2016-02 also requires additional disclosures regarding leasing arrangements. ASU 2016-02 is effective for interim periods and fiscal years beginning after December 15, 2018, and early application is permitted. The Company has evaluated the adoption of this guidance and has determined there will not be a material impact on its consolidated financial statements.

In May 2017, the FASB issued ASU No. 2017-09, *Compensation - Stock Compensation (Topic 718)*. ASU 2017-09 provides guidance about which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting in Topic 718. ASU 2017-09 is effective for interim periods and fiscal years beginning after December 15, 2017, and early application is permitted. The implementation of ASU 2017-09 did not have a material effect on the Company's consolidated financial statements.

In July 2017, the FASB issued ASU No. 2017-11 *Part I, Earnings Per Share (Topic 260), Distinguishing Liabilities from Equity (Topic 480), Derivatives and Hedging (Topic 815)*. ASU 2017-11 Part I changes the classification analysis of certain equity linked financial instruments with down round features. ASU 2017-11 Part I is effective, for public business entities, for interim periods and fiscal years beginning after December 15, 2018, and early application is permitted. The Company has evaluated the adoption of this guidance and has determined there will not be a material impact on its consolidated financial statements.

In June 2018, the FASB issued ASU No. 2018-07, *Compensation-Stock Compensation (Topic 718): Improvements to Non-employee Share-Based Payment Accounting*, which simplifies the accounting for share-based payments to non-employees by aligning it with the accounting for share-based payments to employees, with specified exceptions. This standard is effective for the Company in the first quarter of 2020, and early adoption is permitted. The Company expects the adoption of this standard will not have a material impact on its consolidated financial statements.

In August 2018, the FASB issued ASU No. 2018-13, *Fair Value Measurement (Topic 820): Disclosure Framework-Changes to the Disclosure Requirements for Fair Value Measurement*, which modifies the disclosure requirements of fair value measurements. This standard is effective for the Company in the first quarter of 2020, and early adoption is permitted. The Company is currently evaluating the impact of the effect adoption of this standard will have on its consolidated financial statements.

Other new pronouncements issued but not effective as of December 31, 2018 are not expected to have a material impact on the Company's consolidated financial statements.

NOTE 4. LIQUIDITY, CONTINUED OPERATIONS, AND GOING CONCERN

During the years ended December 31, 2018 and 2017, the Company entered into multiple financing agreements to fund operations. Further discussion of these transactions can be found in Notes 8, 9, 10, 11, 12, and 14.

The Company has continued limited PV production at its manufacturing facility. The Company does not expect that sales revenue and cash flows will be sufficient to support operations and cash requirements until it has fully implemented its product strategy. During the year ended December 31, 2018 the Company used \$4,015,846 in cash for operations. The Company's primary significant long term cash obligation consists of a note payable of \$5,378,062 to a financial institution secured by a mortgage on its headquarters and manufacturing building in Thornton, Colorado. Total payments of approximately \$693,611, including principal and interest, will come due in the remainder of 2019.

Additional projected product revenues are not anticipated to result in a positive cash flow position for the year 2019 overall and, as of December 31, 2018, the Company has negative working capital. As such, cash liquidity sufficient for the year ending December 31, 2019 will require additional financing.

The Company continues to accelerate sales and marketing efforts related to its consumer and military solar products and specialty PV application strategies through expansion of its sales and distribution channels. The Company has begun activities related to securing additional financing through strategic or financial investors, but there is no assurance the Company will be able to raise 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.

As a result of the Company's recurring losses from operations, and the need for additional financing to fund its operating and capital requirements, there is uncertainty regarding the Company's ability to maintain liquidity sufficient to operate its business effectively, which raises substantial doubt as to the Company's ability to continue as a going concern. The Company has scaled down its operations, due to cash flow issues, and does not expect to ramp up until significant financing is obtained.

Management cannot provide any assurances that the Company will be successful in accomplishing any of its plans. These consolidated financial statements do not include any adjustments that might be necessary should the Company be unable to continue as a going concern.

NOTE 5. TRADE RECEIVABLES

Trade receivables, net consist of amounts generated from product sales and government contracts. Accounts receivable totaled \$165,160 and \$6,658 as of December 31, 2018 and 2017, respectively.

Provisional Indirect Cost Rates - The Company bills the government under cost-based research and development contracts at provisional billing rates which permit the recovery of indirect costs. These rates are subject to audit on an annual basis by the government agencies' cognizant audit agency. The cost audit may result in the negotiation and determination of the final indirect cost rates. In the opinion of management, re-determination of any cost-based contracts will not have a material effect on the Company's financial position or results of operations.

NOTE 6. PROPERTY, PLANT AND EQUIPMENT

The following table summarizes property, plant and equipment as of December 31, 2018 and December 31, 2017 :

	As of December 31,	
	2017	2017
Building	\$ 5,828,960	\$ 5,828,960
Furniture, fixtures, computer hardware and computer software	489,421	489,421
Manufacturing machinery and equipment	30,302,806	30,327,481
Depreciable property, plant and equipment	36,621,187	36,645,862
Less: Accumulated depreciation and amortization	(32,207,829)	(32,013,686)
Net property, plant and equipment	\$ 4,413,358	\$ 4,632,176

The Company analyzes its long-lived assets for impairment, both individually and as a group, whenever events or changes in circumstances indicate that the carrying amount of the assets may not be recoverable.

Depreciation expense for the years ended December 31, 2018 and 2017 was \$218,818 and \$1,030,237 , respectively. Depreciation expense is recorded under “Depreciation and amortization expense” in the Consolidated Statements of Operations.

NOTE 7. INVENTORIES

Inventories consisted of the following at December 31, 2018 and December 31, 2017 :

	As of December 31,	
	2018	2017
Raw materials	\$ 660,791	\$ 688,904
Work in process	—	11,878
Finished goods	—	337,072
Total	\$ 660,791	\$ 1,037,854

NOTE 8. NOTES PAYABLE

On February 24, 2017 , the Company entered into an agreement with a vendor to convert the balance of their account into three notes payable in the aggregate amount of \$765,784 . The notes bear interest of 6% per annum and matured on February 24, 2018 ; all outstanding principal and accrued interest is due and payable upon maturity. On June 5, 2018, the Company entered into another agreement with the same vendor to convert the balance of their account into a fourth note payable with a principal amount of \$308,041 , this note also bears interest at a rate of 6% per annum, and matured on July 31, 2018 . As of December 31, 2018 , the Company had not made any payments on these notes; the total outstanding principal and accrued interest were \$1,073,825 and \$96,881 , respectively, and the note is due upon demand.

On March 23, 2017 , the Company entered into an agreement with a vendor to convert the balance of their account into a note payable in the amount of \$356,742 . The note bears interest of 5% per annum and matured on March 31, 2018 ; all outstanding principal and accrued interest is due and payable upon maturity. As of December 31, 2018 , the note had been redeemed in stock; on July 25, 2018 , the vendor, elected to redeem the note principal balance of \$356,742 , along with \$23,897 in accrued interest, for 2,138,421 shares of common stock. The conversion rate was based on the average of the prior five trading days' closing price.

On June 30, 2017 , the Company entered into an agreement with a vendor to convert the balance of their account into a note payable in the amount of \$250,000 . The note bears interest of 5% per annum and matured on February 28, 2018 . As of December 31, 2018 , the Company had not made any payments on this note, the accrued interest was \$18,801 , and the note is due upon demand.

On September 30, 2017 , the Company entered into a settlement agreement with a customer to convert the credit balance of their account into a note payable in the amount of \$215,234 . The note bears interest of 5% per annum and matured on September 30, 2018 . The Company has not made the monthly payments of \$18,426 that were to commence on October 30, 2017 ; as of December 31, 2018 , the company had paid principal of \$22,529 and interest of \$897 . The remaining principal and interest balances, as of December 31, 2018 , were \$192,705 and \$11,684 , respectively.

NOTE 9. DEBT

On February 8, 2008, the Company acquired a manufacturing and office facility in Thornton, Colorado, for approximately \$5.5 million. The purchase was financed by a promissory note, deed of trust and construction loan agreement (the “Construction Loan”) with the Colorado Housing and Finance Authority (“CHFA”), which provided the Company borrowing availability of up to \$7.5 million for the building and building improvements. In 2009, the Construction Loan was converted to a permanent loan pursuant to a Loan Modification Agreement between the Company and CHFA (the “Permanent Loan”). The Permanent Loan, collateralized by the building, has an interest rate of 6.6% and the principal will be amortized through its term to February 2028. Further, pursuant to certain negative covenants in the Permanent Loan, the Company may not, among other things, without CHFA’s prior written consent (which by the terms of the deed of trust is subject to a reasonableness requirement): 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 the Company’s officers, shareholders, directors or employees.

On November 1, 2016, the Company and the CHFA agreed to modify the original agreement described above with the addition of a forbearance period. Per the modification agreement, no payments of principal and interest shall be due under the note during the forbearance period commencing on November 1, 2016 and continuing through April 1, 2017. The amount of interest that should have been paid by the Company during the forbearance period in the total amount of \$180,043 shall be added to the outstanding principal balance of the note. As a result, on May 1, 2017, the principal balance of the note was \$5,704,932. Commencing on May 1, 2017, the monthly payments of principal and interest due under the note resumed at \$57,801, and the Company shall continue to make such monthly payments over the remaining term of the note ending in February 2028.

On August 24, 2018, the Company and the CHFA agreed to modify the original agreement with an additional forbearance period. Per the modification agreement, no payments of principal shall be due under the note during the forbearance period commencing on June 1, 2018 and continuing through November 30, 2018. For each month of forbearance, partial interest of \$15,000 per month must be paid, and the remaining unpaid interest of the forbearance period of \$84,187 will be added to the outstanding principal balance of the note. As a result, on December 1, 2018, the principal balance of the note will be \$5,434,042 and monthly payments of principal and interest of \$57,801 will resume, continuing through the remaining term of the note ending in February 2028.

The outstanding principal balance of the Permanent Loan was \$5,378,062 and \$5,461,819 as of December 31, 2018 and December 31, 2017, respectively.

As of December 31, 2018, remaining future principal payments on long-term debt are due as follows:

2019	\$	349,093
2020	\$	372,843
2021	\$	398,209
2022	\$	425,301
2023	\$	454,235
Thereafter	\$	3,378,381
	\$	<u>5,378,062</u>

NOTE 10. SECURED PROMISSORY NOTE

The following table provides a summary of the activity of the Company's secured notes:

	Global Ichiban		St. George		Total
Secured Notes Principal Balance at December 31, 2017	\$	4,557,227	\$	—	\$ 4,557,227
New notes		1,935,000		1,315,000	3,250,000
Note conversions		(1,426,000)		—	(1,426,000)
Interest redocumented as principal		140,518		—	140,518
Note assignments		(250,000)		—	(250,000)
Secured Notes Principal Balance at December 31, 2018		4,956,745		1,315,000	6,271,745
Less: remaining discount		(2,012,698)		(811,667)	(2,824,365)
Secured Notes, net of discount, at December 31, 2018	\$	2,944,047	\$	503,333	\$ 3,447,380

Global Ichiban Secured Promissory Notes

On November 30, 2017, the Company, entered into a note purchase and exchange agreement with Global Ichiban Ltd. ("Global"), for the private placement of up to \$2,000,000 of the Company's secured convertible promissory notes in exchange for \$2,000,000 of gross proceeds in several tranches through June 2018. The closing of each tranche is conditioned upon the Company having an average daily trading volume for its Common Stock of at least \$50,000 for the 20 trading day period preceding such future tranche closing dates.

Pursuant to the terms of the note purchase and exchange agreement, the Company and Global also agreed to exchange certain outstanding securities held by the Global for additional notes. As of November 30, 2017, Global surrendered for cancellation (i) its outstanding promissory note dated September 13, 2017 (\$3,359,539 principal and accrued interest), (ii) its outstanding promissory note dated October 31, 2017 (\$252,466 principal and accrued interest), and (iii) its 400 shares of outstanding Series J Preferred Stock (\$445,222 of capital and accrued dividends). In exchange, the Company issued to Global \$4,057,227 aggregate principal amount of additional Notes.

All principal and accrued interest on the notes are redeemable at any time, in whole or in part, at the option of Global. The redemption amount may be paid in cash or converted into shares of common stock at a variable conversion price equal to the lowest of (i) 85% of the average VWAP for the shares over the prior 5 trading days, (ii) the closing bid price for the shares on the prior trading day, or (iii) \$2.00 per share, at the option of the Company.

The notes may not be converted, and shares of common stock may not be issued pursuant to the notes, if, after giving effect to the conversion or issuance, the holder together with its affiliates would beneficially own in excess of 9.99% of the outstanding shares of common stock.

Of the notes issued on November 30, 2017, \$3,359,539 aggregate principal amount will mature on December 15, 2020. Principal and interest was originally to be payable in 36 equal monthly installments of \$111,585 beginning January 15, 2018. During the year ended December 31, 2018, principal of \$(1,426,000) was converted into 3,486,276 shares of common stock, and \$140,518 of interest was converted to principal. The remaining note is payable in 30 equal monthly installments of \$80,360 beginning July 15, 2018. The Company has not made the payments as outlined in the agreement, this note is due upon demand.

The following table summarizes the conversion activity of this note:

Conversion Period	Principal Converted		Interest Converted		Common Shares Issued
Q1 2018	\$	1,250,000	\$	—	2,450,981
Q2 2018	\$	176,000	\$	—	1,035,295
	\$	<u>1,426,000</u>	\$	<u>—</u>	<u>3,486,276</u>

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Of the notes issued on November 30, 2017, \$697,688 aggregate principal amount matured on November 30, 2018. Principal and interest on these notes are due upon demand.

The \$2,000,000 aggregate principal amount of notes, issued in eight tranches, will mature on the first anniversary of the respective issuance date. Principal and interest will be payable upon maturity; for the maturity dates that have passed, the note is due upon demand. As of December 31, 2018, the closing dates, closing amounts, and maturity dates on completed note tranches are as follows:

Closing Date	Closing Amount	Maturity Date
11/30/2017 \$	250,000	11/30/2018
12/28/2017 \$	250,000	12/28/2018
1/11/2018 \$	250,000	1/11/2019
1/25/2018 \$	250,000	1/25/2019
2/8/2018 \$	250,000	2/8/2019
2/21/2018 \$	250,000	2/21/2019
3/7/2018 \$	250,000	3/7/2019
3/21/2018 \$	250,000	3/21/2019

On July 6, 2018, the Company issued an additional, promissory note to Global, pursuant to the note purchase and exchange agreement dated November 30, 2017. In accordance with the agreement, the Company issued a note with a principal balance of \$135,000 in exchange for gross proceeds of \$120,000. This note matures on July 6, 2019. Principal and interest on this note are payable at maturity. The original issue discount of \$15,000 will be allocated to interest expense, ratably, over the life of the note. This note is not redeemable in stock.

On October 2, 2018, the Company issued an additional promissory note to Global, pursuant to the note purchase and exchange agreement dated November 30, 2017. In accordance with the agreement, the Company issued a note with a principal balance of \$150,000 in exchange for gross proceeds of \$125,000. This note matures on October 2, 2019. Principal and interest on this note are payable at maturity. The original issue discount of \$25,000 will be allocated to interest expense, ratably, over the life of the note. This note is redeemable in stock, at the discretion of the Company, under the same conversion terms described above.

On October 18, 2018, Global sold one of its notes to another investor. As a result of this sale, \$250,000 in principal and \$26,466 of accrued interest were assigned to the new investor and is no longer considered secured debt. Please refer to Note 12 for further discussion of this assignment. This note is redeemable in stock, at the discretion of the Company, under the same conversion terms described above.

On October 22, 2018, the Company issued an additional promissory note to Global, pursuant to the note purchase and exchange agreement dated November 30, 2017. In accordance with the agreement, the Company issued a note with a principal balance of \$150,000 in exchange for gross proceeds of \$125,000. This note matures on October 22, 2019. Principal and interest on this note are payable at maturity. The original issue discount of \$25,000 will be allocated to interest expense, ratably, over the life of the note.

All the notes issued in accordance with the note purchase and exchange agreement dated November 30, 2017 are secured by a security interest on substantially all of the Company's assets, bear interest at a rate of 12% per annum and contain standard and customary events of default including but not limited to: (i) failure to make payments when due under the notes, and (ii) bankruptcy or insolvency of the Company. There are no registration rights applicable to the notes.

As of December 31, 2018, the aggregate principal and interest balance of the Notes were \$4,956,745 and \$455,356, respectively.

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Pursuant to a number of factors outlined in ASC Topic 815, *Derivatives and Hedging*, the conversion option in the notes were deemed to include an embedded derivative that required bifurcation and separate accounting. As such, the Company ascertained the value of the conversion option as if separate from the convertible issuance and appropriately recorded that value as a derivative liability. The fair value measurements rely primarily on Company-specific inputs and the Company's own assumptions. With the absence of observable inputs, the Company determined these recurring fair value measurements reside primarily within Level 3 of the fair value hierarchy. The derivative associated with the notes approximates management's estimate of the fair value of the embedded derivative liability based on using a Monte Carlo simulation following a Geometric Brownian Motion with the following assumptions identified below.

The following table summarizes the derivative liability transactions for these notes:

Derivative Liability Balance as of December 31, 2017	\$	4,897,178
Additional derivative liability on new notes		1,446,156
Derivative Liability assigned to another investor		(119,039)
Change in fair value of derivative liability		(2,690,434)
Derivative Liability Balance as of December 31, 2018	\$	3,533,861

Due to the varying terms and varying issue dates, the tranches of this instrument were broken into five separate instruments for valuation purposes.

- 1) The first valuation was done on the November 30, 2017 note with term of three years. The derivative value of this note was \$3,742,002 as of December 31, 2017.
- 2) The second valuation was done on the group of notes dated November 30, 2017, that had a term of one year. The derivative value of this group of notes was \$888,168 as of December 31, 2017.
- 3) The third valuation was done on the note dated December 28, 2017, which had a term of one year. The derivative value of this note was \$267,008 on December 31, 2017.
- 4) For the notes dated in the first quarter of 2018, we did a fourth valuation. Although the notes were entered into at various dates, we used a weighted average issuance date of February 15, 2018 for a combined valuation purpose. Management's analysis, using the following assumptions: annual volatility of 54% present value discount rate of 12% and a dividend yield of 0%, resulted in a fair value of the embedded derivative associated with these Notes of \$1,151,162 as of February 15, 2018. The value of the embedded derivative associated with these Notes was recorded as a debt discount and will be charged to interest expense, ratably, over the life of the notes.
- 5) For the notes dated in the fourth quarter of 2018, we did a fifth valuation. Although the notes were entered into at various dates, we used a weighted average issuance date of October 12, 2018 for a combined valuation purpose. Management's analysis, using the following assumptions: annual volatility of 60% present value discount rate of 12% and a dividend yield of 0%, resulted in a fair value of the embedded derivative associated with these Notes of \$294,994 as of October 12, 2018. The fair value of the derivative was greater than the face value at issuance and the difference of \$44,994 was charged to interest expense at issuance. The remaining debt discount of \$250,000 will be charged to interest expense ratably over the life of the notes.

The derivative liability associated with the notes is subject to revaluation on a quarterly basis to reflect the market value change of the embedded conversion option. At December 31, 2018, the Company conducted a fair value assessment of the embedded derivative associated with the three valuation groups discussed above.

- 1) For the November 30, 2017 3yr note: Management conducted a fair value assessment with the following assumptions: annual volatility of 65% present value discount rate of 12% and a dividend yield of 0% as of December 31, 2018. As a result of the fair value assessment, the Company recorded a net gain of \$1,977,934 as "Change in fair value of derivatives and gain/(loss) on extinguishment of liabilities, net" in the Consolidated Statements of Operations to properly reflect the fair value of the embedded derivative of \$1,764,068 as of December 31, 2018.

- 2) For the November 30, 2017 1yr notes: Management conducted a fair value assessment with the following assumptions: annual volatility of 56% present value discount rate of 12% and a dividend yield of 0% as of December 31, 2018 . As a result of the fair value assessment, the Company recorded a net gain of \$350,164 as "Change in fair value of derivatives and gain/(loss) on extinguishment of liabilities, net" in the Consolidated Statements of Operations to properly reflect the fair value of the embedded derivative of \$418,965 as of December 31, 2018 .

In addition to the fair value assessment, \$119,039 of the pre-adjusted derivative liability was assigned to the other investor described above. Please refer to Note 22 for further information.

- 3) For the December 28, 2017 1yr note: Management conducted a fair value assessment with the following assumptions: annual volatility of 56% present value discount rate of 12% and a dividend yield of 0% as of December 31, 2018 . As a result of the fair value assessment, the Company recorded a net gain of \$116,882 as "Change in fair value of derivatives and gain/(loss) on extinguishment of liabilities, net" in the Consolidated Statements of Operations to properly reflect the fair value of the embedded derivative of \$150,126 as of December 31, 2018 .
- 4) For the first quarter 2018 1yr notes: Management conducted a fair value assessment with the following assumptions: annual volatility of 56% present value discount rate of 12% and a dividend yield of 0% as of December 31, 2018 . As a result of the fair value assessment, the Company recorded a net gain of \$250,405 as "Change in fair value of derivatives and gain/(loss) on extinguishment of liabilities, net" in the Consolidated Statements of Operations to properly reflect the fair value of the embedded derivative of \$900,757 as of December 31, 2018 .
- 5) For the fourth quarter 2018 1yr notes: Management conducted a fair value assessment with the following assumptions: annual volatility of 71% present value discount rate of 12% and a dividend yield of 0% as of December 31, 2018 . As a result of the fair value assessment, the Company recorded a net loss of \$4,951 as "Change in fair value of derivatives and gain/(loss) on extinguishment of liabilities, net" in the Consolidated Statements of Operations to properly reflect the fair value of the embedded derivative of \$299,945 as of December 31, 2018 .

The total cumulative net gain for the year ended December 31, 2018 was \$2,690,434 to reflect a total derivative liability of \$3,533,861 as of December 31, 2018 .

Subsequent to the date of this report, the Company conducted additional transactions under this security agreement. Please refer to Note 21 for more information.

St. George Secured Convertible Notes

On May 8, 2018 , the Company, entered into a note purchase agreement with St. George Investments LLC ("St. George"), for the private placement of a \$575,000 secured convertible promissory note. The Company received \$500,000 in aggregate proceeds for the note in two tranches and recorded and original issue discount of \$50,000 and debt financing costs of \$25,000 . The original issue discount and the financing costs will be recognized as interest expense, ratably, over the life of the note. The note bears interest at a rate of 10% per annum and matures on May 9, 2019 . All unredeemed principal and accrued interest is payable upon maturity. The note contains standard and customary events of default including but not limited to: (i) failure to make payments when due under the note, and (ii) bankruptcy or insolvency of the Company. In the event of default the interest rate increases to 22% per annum. The note is secured by a junior security interest on the Company's headquarters building, located in Thornton, Colorado. There are no registration rights applicable to this agreement.

Beginning in early November 2018, St. George shall have the option to require the Company to redeem all or a portion of the amounts outstanding under the note. The Company may pay the requested redemption amounts in cash or in the form of shares of common stock (subject to certain specified equity conditions). Payments in the form of Common Stock shall be calculated using a variable conversion price equal to (i) 60% of the average of the two lowest closing bid prices for the shares over (ii) the prior ten day trading period immediately preceding the redemption.

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On November 5, 2018, the Company entered into a second securities purchase agreement with St. George, for the private placement of a \$1,220,000 secured convertible promissory note ("Company Note"). On November 7, 2018, the Company received \$200,000 of gross proceeds from the offering of the Company Note. In addition, the Company received additional consideration for the Company Note in the form of eight separate promissory notes of St. George (the "Investor Notes") having an aggregate principal amount of \$800,000. The Company may receive additional cash proceeds of up to an aggregate of \$800,000 through cash payments made from time to time by St. George of principal and interest under the eight Investor Notes. The aggregate principal amount of the Company Note is divided into nine tranches, which tranches correspond to (i) the cash funding received on November 5, 2018 and (ii) the principal amounts of the eight Investor Notes. As of December 31, 2018, the Company had received an additional \$400,000 in proceeds and had recorded \$740,000 in principal related to the Company and Investor Notes. The Company recorded and original issue discounts of \$80,000 and debt financing costs of \$20,000, which will be recognized as interest expense, ratably, over the life of the note. As of December 31, 2018, the closing dates, closing amounts, and proceeds on completed Note tranches are as follows:

Closing Date	Closing Amount	Proceeds
11/7/2018	\$ 260,000	200,000
11/19/2018	\$ 120,000	100,000
11/30/2018	\$ 120,000	100,000
12/7/2018	\$ 120,000	100,000
12/17/2018	\$ 120,000	100,000

The Notes bear interest at a rate of 10% per annum and matures on November 5, 2019. All unredeemed principal and accrued interest is payable upon maturity. The Notes contain standard and customary events of default including but not limited to: (i) failure to make payments when due under the note, and (ii) bankruptcy or insolvency of the Company. In the event of default the interest rate increases to 22% per annum. The Notes are secured by a security interest on the Company's headquarters building, located in Thornton, Colorado. There are no registration rights applicable to this agreement.

Beginning in early May 2019, St. George shall have the option to redeem all or a portion of the amounts outstanding under the Company Note. At St. George's option, redemption amounts are payable by the Company in cash or in the form of shares of the common stock. Conversions into common stock shall be calculated using a variable conversion price equal to 60% of the average of the two lowest closing bid price for the shares over the prior ten day trading period immediately preceding the conversion.

Shares of common stock may not be issued pursuant to the note if, after giving effect to the conversion or issuance, the holder together with its affiliates would beneficially own in excess of 9.99% of the outstanding shares of common stock.

As of December 31, 2018, the aggregate principal and interest balance of the Notes were \$1,315,000 and \$45,121, respectively.

Pursuant to a number of factors outlined in ASC Topic 815, *Derivatives and Hedging*, the conversion option in the notes were deemed to include an embedded derivative that required bifurcation and separate accounting. As such, the Company ascertained the value of the conversion option as if separate from the convertible issuance and appropriately recorded that value as a derivative liability. The fair value measurements rely primarily on Company-specific inputs and the Company's own assumptions. With the absence of observable inputs, the Company determined these recurring fair value measurements reside primarily within Level 3 of the fair value hierarchy. The derivative associated with the notes approximates management's estimate of the fair value of the embedded derivative liability based on using a Monte Carlo simulation following a Geometric Brownian Motion with the following assumptions identified below.

The following table summarizes the derivative liability transactions for these notes:

Derivative Liability Balance as of December 31, 2017	\$	—
Additional derivative liability on new notes		1,664,553
Change in fair value of derivative liability		1,628,139
Derivative Liability Balance as of December 31, 2018	\$	3,292,692

Due to the varying terms and varying issue dates, the tranches of this instrument were broken into two separate instruments for valuation purposes.

- 1) For the May 2018 note, the Company conducted an initial valuation. Management's analysis, using the following assumptions: annual volatility of 50% present value discount rate of 12% and a dividend yield of 0% , resulted in a fair value of the embedded derivative associated with these Notes of \$862,439 as of May 8, 2018 . The fair value of the derivative was greater than the face value at issuance and the difference of \$337,439 was charged to interest expense at issuance. The remaining debt discount of \$525,000 will be charged to interest expense ratably over the life of the note.
- 2) For the Company and Investor Notes, the Company conducted an initial valuation. Although the notes were entered into at various dates, we used a weighted average issuance date of November 26, 2018 for a combined valuation purpose. Management's analysis, using the following assumptions: annual volatility of 62% present value discount rate of 12% and a dividend yield of 0% , resulted in a fair value of the embedded derivative associated with these Notes of \$802,114 as of November 26, 2018 . The fair value of the derivative was greater than the face value at issuance and the difference of \$182,114 was charged to interest expense at issuance. The remaining debt discount of \$620,000 will be charged to interest expense ratably over the life of the note.

The derivative liability associated with the notes is subject to revaluation on a quarterly basis to reflect the market value change of the embedded conversion option. At December 31, 2018 , the Company conducted a fair value assessment of the embedded derivative associated with the two valuation groups discussed above.

- 1) For the May 2018 note: Management conducted a fair value assessment with the following assumptions: annual volatility of 85% present value discount rate of 12% and a dividend yield of 0% as of December 31, 2018 . As a result of the fair value assessment, the Company recorded a loss of \$706,291 as "Change in fair value of derivatives and gain/(loss) on extinguishment of liabilities, net" in the Consolidated Statements of Operations to properly reflect the fair value of the embedded derivative of \$1,568,730 as of December 31, 2018 .
- 2) For the Company and Investor Notes: Management conducted a fair value assessment with the following assumptions: annual volatility of 66% present value discount rate of 12% and a dividend yield of 0% as of December 31, 2018 . As a result of the fair value assessment, the Company recorded a loss of \$921,848 as "Change in fair value of derivatives and gain/(loss) on extinguishment of liabilities, net" in the Consolidated Statements of Operations to properly reflect the fair value of the embedded derivative of \$1,723,962 as of December 31, 2018 .

The total cumulative net loss for the year ended December 31, 2018 was \$1,628,139 to reflect a total derivative liability of \$3,292,692 as of December 31, 2018 .

Subsequent to the date of this report, the Company conducted additional secured transactions with St. George. Please refer to Note 21 for more information.

NOTE 11. PROMISSORY NOTES

The following table provides a summary of the activity of the Company's non-convertible, unsecured, promissory notes:

	Investor 1		Investor 2		Investor 3		Total
Promissory Notes Principal Balance at December 31, 2017	\$	494,437	\$	275,000	\$	200,000	\$ 969,437
New notes		—		—		850,000	850,000
Notes redocumented		—		(275,000)		(200,000)	(475,000)
Promissory Notes Principal Balance at December 31, 2018		494,437		—		850,000	1,344,437
Less: remaining discount		—		—		(104,583)	(104,583)
Promissory Notes, net of discount, at December 31, 2018	\$	494,437	\$	—	\$	745,417	\$ 1,239,854

Offering of Unsecured, Non-Convertible Notes to Investor 1

During October 2016, the Company received \$420,000 from a private investor "Investor 1". These funds, along with \$250,000 of additional funding, were rolled into a promissory note, executed on January 17, 2017, in the amount of \$700,000 issued with a discount of \$30,000 which was charged to interest expense ratably over the term of the note. The note bears interest at 12% per annum and matures on July 17, 2017. Principal and interest on this note were payable at maturity. This note is not convertible into equity shares of the Company and is unsecured.

On June 30, 2017, the Company and Investor 1 agreed to a 12 month payment plan on the balance of this promissory note. Interest will continue to accrue on this note at 12% per annum and payments of approximately \$62,000 will be made monthly beginning in July 2017. The Company has not made all the payments according to this payment plan, and the note is payable upon demand.

As of December 31, 2018, \$205,563 of principal and \$45,414 of interest had been paid on this note. The outstanding principal and accrued interest balances on the note as of December 31, 2018 were \$494,437 and \$86,459, respectively.

Offering of Unsecured, Non-Convertible Notes to Investor 2

On November 16, 2017, the Company initiated a non-convertible, unsecured promissory note with another private investor ("Investor 2") for \$275,000. The promissory note was issued with an original issue discount of \$25,000, resulting in proceeds to the company of \$250,000. The note does not have a stated interest rate and matured on December 18, 2017.

On July 25, 2018, the Company, entered into a new securities exchange agreement with Investor 2. Pursuant to the terms of the Exchange Agreement, Investor 2 agreed to surrender and exchange the promissory note with a principal balance of \$275,000 in exchange for a convertible note. See Note 12 for further discussion on the new convertible note.

Offering of Unsecured, Non-Convertible Notes to Investor 3

On January 31, 2018, the Company initiated a non-convertible, unsecured promissory note with another private investor ("Investor 3") for an aggregate principal amount of \$200,000. The promissory note was issued with an original issue discount of \$22,500, which was recorded as interest expense ratably over the term of the note, resulting in proceeds to the company of \$177,500, which was received in December 2017. The note bears interest at 12% per annum and matures on December 29, 2018. All principal and interest is payable upon maturity.

On September 7, 2018, the Company, entered into a new securities exchange agreement with Investor 3. Pursuant to the terms of the Exchange Agreement, Investor 3 agreed to surrender and exchange promissory note with a principal balance of \$200,000, plus accrued interest of \$16,800, in exchange for a convertible note. See Note 12 for further discussion on the new convertible note.

On June 6, 2018, the Company initiated a second non-convertible, unsecured promissory note with Investor 3 for an aggregate principal amount of \$315,000. The promissory note was issued with an original issue discount of \$55,000, which will be recorded as interest expense ratably over the term of the note, resulting in proceeds to the company of \$260,000, that was received in several tranches between February 2018 and April 2018. This note bears interest at 12% per annum and matures on June 6, 2019. All principal and interest is payable upon maturity. As of December 31, 2018, the remaining principal and interest on this note were \$315,000 and \$27,090, respectively.

On July 24, 2018, the Company initiated a third non-convertible, unsecured promissory note with Investor 3 for an aggregate principal amount of \$115,000. The promissory note was issued with an original issue discount of \$27,500, which will be recorded as interest expense ratably over the term of the note, resulting in proceeds to the company of \$87,500, which was received in several tranches between May 2018 and June 2018. This note bears interest at 12% per annum and matures on January 24, 2019. All principal and interest is payable upon maturity. As of December 31, 2018, the remaining principal and interest on this note were \$115,000 and \$7,923, respectively.

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On September 10, 2018, the Company initiated a fourth non-convertible, unsecured promissory note with Investor 3 for an aggregate principal amount of \$120,000. The promissory note was issued with an original issue discount of \$20,000, which will be recorded as interest expense ratably over the term of the note, resulting in proceeds to the company of \$100,000, which was received in several tranches between June 2018 and September 2018. This note bears interest at 12% per annum and matures on March 10, 2019. All principal and interest is payable upon maturity. As of December 31, 2018, the remaining principal and interest on this note were \$120,000 and \$5,029, respectively.

On December 31, 2018, the Company initiated a fifth non-convertible, unsecured promissory note with Investor 3 for an aggregate principal amount of \$300,000. The promissory note was issued with an original issue discount of \$75,000, which will be recorded as interest expense ratably over the term of the note, resulting in proceeds to the company of \$225,000, which was received in several tranches between September 2018 and December 2018. This note bears interest at 12% per annum and matures on June 30, 2019. All principal and interest is payable upon maturity. As of December 31, 2018, the remaining principal and interest on this note were \$300,000 and \$4,954, respectively.

As of December 31, 2018, the aggregate outstanding principal and interest for Investor 3 was \$850,000 and \$44,996, respectively.

Subsequent to the date of this report, the Company conducted additional transactions with promissory notes. Please refer to Note 21 for more information.

NOTE 12. CONVERTIBLE NOTES

The following table provides a summary of the activity of the Company's unsecured, convertible, promissory notes:

	Oct 2016 Notes	St. George Note	BayBridge Notes	Bellridge Notes	Power Up Notes	EMA Note	Total
Promissory Notes Principal Balance at December 31, 2017	\$ 330,000	\$ 1,705,833	\$ 565,000	\$ —	\$ —	\$ —	\$ 2,600,833
New notes	—	—	—	150,000	225,000	75,000	450,000
Notes redocumented or assigned	—	—	270,000	550,000	—	—	820,000
Notes converted to common stock	—	(606,600)	(772,500)	(245,000)	—	—	(1,624,100)
Promissory Notes Principal Balance at December 31, 2018	330,000	1,099,233	62,500	455,000	225,000	75,000	2,246,733
Less: remaining discount	—	(96,177)	(62,100)	(123,360)	(110,621)	(1,753)	(394,011)
Promissory Notes, net of discount, at December 31, 2018	\$ 330,000	\$ 1,003,056	\$ 400	\$ 331,640	\$ 114,379	\$ 73,247	\$ 1,852,722

October 2016 Convertible Notes

On October 5, 2016, the Company entered into a securities purchase agreement with a private investor for the private placement of \$330,000 principal amount of convertible notes. At Closing, the Company sold and issued \$330,000 principal amount of convertible notes in exchange for \$330,000 of gross proceeds.

The convertible notes matured on December 31, 2017 and bear interest at a rate of 6% per annum, subject to increase to 24% per annum upon the occurrence and continuance of an event of default. Principal and accrued interest on the convertible notes is payable upon demand, the default interest rate has not been designated by the investor.

All principal and accrued interest on the convertible notes is convertible at any time, in whole or in part, at the option of the investor, into shares of common stock at a variable conversion price equal to 80% of the lowest closing bid price of the Company's common stock for the fifteen consecutive trading day period prior to the conversion date. After the six month anniversary of the issuance of any convertible note, the conversion price for such note shall thereafter be equal to 50% of the lowest closing bid price of the Company's common stock for the fifteen consecutive trading day period prior to the conversion date.

The convertible notes contain standard and customary events of default including but not limited to: (i) failure to make payments when due under the convertible notes; and (ii) bankruptcy or insolvency of the Company.

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Outstanding principal and accrued interest on the convertible notes were \$330,000 and \$44,935 , respectively as of December 31, 2018 .

Pursuant to a number of factors outlined in ASC Topic 815, *Derivatives and Hedging* , the conversion option in the convertible notes were deemed to include an embedded derivative that required bifurcation and separate accounting. As such, the Company ascertained the value of the conversion option as if separate from the convertible issuance and appropriately recorded that value as a derivative liability. At closing, a derivative liability and a corresponding debt discount in the amount of \$330,000 was recorded. The fair value of the derivative was greater than the face value at issuance and the difference of \$341,114 was charged to interest expense at issuance. The remaining debt discount will be charged to interest expense ratably over the life of the October 2016 Convertible Notes. As of December 31, 2017 , the fair value of the derivative liability was \$572,643 .

The following table summarizes the derivative liability transactions for this note:

Derivative Liability Balance as of December 31, 2017	\$	572,643
Additional derivative liability on new notes		—
Change in fair value of derivative liability		303,838
Derivative Liability Balance as of December 31, 2018	\$	876,481

The derivative liability associated with the convertible notes is subject to revaluation on a quarterly basis to reflect the market value change of the embedded conversion option. At December 31, 2018 , the Company conducted a fair value assessment of the embedded derivative associated with the convertible notes. As a result of the fair value assessment, the Company recorded a \$303,838 loss as "Change in fair value of derivatives and gain/(loss) on extinguishment of liabilities, net" in the Consolidated Statements of Operations for the year ended December 31, 2018 , to properly reflect the fair value of the embedded derivative of \$876,481 as of December 31, 2018 .

The fair value measurements rely primarily on company-specific inputs and the Company's own assumptions. With the absence of observable inputs, the Company determined these recurring fair value measurements reside primarily within Level 3 of the fair value hierarchy. The derivative associated with the convertible notes approximates management's estimate of the fair value of the embedded derivative liability at December 31, 2018 based on using a Monte Carlo simulation following a Geometric Brownian Motion with the following assumptions: annual volatility of 63% present value discount rate of 12% and dividend yield of 0% .

St. George Convertible Note

On September 8, 2017 , the Company entered into a securities purchase agreement with St. George Investments, LLC ("St. George") for the private placement of \$1,725,000 principal amount of the Company's original issue discount convertible notes.

On September 11, 2017 , the Company sold and issued a \$1,725,000 principal convertible note to St. George in exchange for \$1,500,000 of gross proceeds, and paid \$20,000 in financing costs. The original issue discount of \$225,000 , and the financing costs, will be charged to interest expense, ratably, over the life of the note.

Unless earlier converted or prepaid, the convertible notes will mature on March 11, 2019 . The note does not bear interest in the absence of an event of default. The note is due upon demand and an interest rate has not been designated by St. George.

For the first six months after the issuance of the convertible note, the Company will make a monthly cash repayment on the note of approximately \$96,000 . Thereafter, St. George may request that the Company make monthly partial redemptions of the note up to \$150,000 per month. If St. George does not request the full \$150,000 redemption amount in any one month, the unused portion of such monthly redemption amount can be added to future monthly redemption amounts; however, in no event, can the amount requested for any one month exceed \$275,000 .

Redemption amounts are payable by the Company in cash. Beginning ten months after the issuance of the convertible note, cash redemption payments by the Company will be subject to a 15% redemption premium. The Company recorded an estimated cash premium of \$172,500 , at inception, which has been charged to interest, ratably, over the life of the note.

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Beginning six months after the issuance of the convertible note, the Company also has the option (subject to customary equity conditions) to pay redemption amounts in the form of shares of common stock. Payments in the form of shares would be calculated using a variable conversion price equal to the lower of (i) 85% of the average VWAP for the shares over the prior five trading days or (ii) the closing bid price for the shares on the prior trading day.

On May 1, 2018, effective as of April 3, 2018, in lieu of making the December 2017 through March 2018 cash payments, the Company agreed to amend the variable conversion price formula outlined in the securities purchase agreement. As amended, payments in the form of shares would be calculated using a variable conversion price equal to the lower of (i) 60% of the lowest VWAP for the shares during the prior five trading days or (ii) the closing bid price for the shares on the prior trading day.

All principal and accrued interest on the convertible note is convertible at any time, in whole or in part, at the option of St. George into shares of common stock at a fixed conversion price of \$4.00 per share.

The convertible note contains standard and customary events of default including but not limited to: (i) failure to make payments when due under the Note; and (ii) bankruptcy or insolvency of the Company. Upon the occurrence of an event of default, the convertible note will begin to bear interest at the rate of 22% per annum. In addition, upon the occurrence of an event of default, St. George has the option to increase the outstanding balance of the convertible note by 25%. The default provisions have not been designated by St. George.

In connection with the closing under the securities purchase agreement, the Company issued 37,500 unregistered shares of common stock to St. George as an origination fee. The closing stock price on the date of close was \$1.70 resulting in an interest expense of \$63,750 being recorded as of the date of close.

The convertible note may not be converted, and shares of common stock may not be issued pursuant to the convertible note if, after giving effect to the conversion or issuance, the holder together with its affiliates would beneficially own in excess of 4.99% of the outstanding shares of common stock.

As of December 31, 2018, cash payments of \$191,667 had been made on the convertible note, and \$606,600 had been converted into 15,849,657 shares of the Company's common stock. The remaining balance on the note was \$926,733 as of December 31, 2018. The following table summarizes the conversion activity of this note:

Conversion Period	Principal Converted	Common Shares Issued
Q1 2018	\$ 75,000	187,500
Q2 2018	\$ 316,600	2,082,778
Q3 2018	\$ 102,500	3,142,333
Q4 2018	\$ 112,500	10,437,046
	\$ 606,600	15,849,657

Pursuant to a number of factors outlined in ASC Topic 815, *Derivatives and Hedging*, the conversion option in the convertible note was deemed to include an embedded derivative that required bifurcation and separate accounting. As such, the Company ascertained the value of the conversion option as if separate from the convertible note issuance and appropriately recorded that value as a derivative liability. As of December 31, 2017, the derivative liability was \$394,280.

The following table summarizes the derivative liability transactions for this note:

Derivative Liability Balance as of December 31, 2017	\$ 394,280
Additional derivative liability on new notes	—
Change in fair value of derivative liability	665,720
Derivative Liability Balance as of December 31, 2018	\$ 1,060,000

The derivative liability associated with the convertible note is subject to revaluation on a quarterly basis to reflect the market value change of the embedded conversion option. At December 31, 2018, the Company conducted a fair value assessment of the embedded derivative associated with the convertible note. As a result of the fair value assessment, the Company recorded a \$665,720 net loss as "Change in fair value of derivatives and gain/(loss) on extinguishment of liabilities, net" in the Consolidated Statements of Operations for the year ended December 31, 2018, to properly reflect the fair value of the embedded derivative of \$1,060,000 as of December 31, 2018.

The fair value measurements rely primarily on company-specific inputs and the Company's own assumptions. With the absence of observable inputs, the Company determined these recurring fair value measurements reside primarily within Level 3 of the fair value hierarchy. The derivative associated with the convertible note approximates management's estimate of the fair value of the embedded derivative liability at December 31, 2018 based on using a Monte Carlo simulation following a Geometric Brownian Motion with the following assumptions: annual volatility of 52% present value discount rate of 12% and dividend yield of 0%.

BayBridge Convertible Note

On December 6, 2017, the Company entered into a securities exchange agreement ("Exchange Agreement 1") with BayBridge Capital Fund LP ("BayBridge").

Pursuant to the terms of the Exchange Agreement 1, BayBridge agreed to surrender and exchange 675 shares of outstanding Series J Preferred Stock (\$755,417 of capital and accrued dividends) for a convertible note with an aggregate principal amount of \$840,000 and an original issue discount of \$84,583 ("Exchange Note 1").

Exchange Note 1 is unsecured, has no applicable registration rights, bears interest at a rate of 12% per annum, matures on December 6, 2018, and contains standard and customary events of default including but not limited to: (i) failure to make payments when due under the convertible note, and (ii) bankruptcy or insolvency of the Company. Principal and interest are payable upon maturity.

Payments of principal and accrued interest on Exchange Note 1 are payable in cash or, at the option of the Company, in shares of common stock at a variable conversion price equal to the lowest of (i) 85% of the average VWAP for the shares over the prior five trading days, (ii) the closing bid price for the shares on the prior trading day, or (iii) \$3.00 per share. Payments in shares of common stock may not be issued pursuant to the note if, after giving effect to the conversion or issuance, the holder together with its affiliates would beneficially own in excess of 9.99% of the outstanding shares of Common Stock.

On September 7, 2018, as described in Note 11, the Company, entered into an additional securities exchange agreement ("Exchange Agreement 2") with Baybridge.

Pursuant to the terms of Exchange Agreement 2, BayBridge agreed to surrender and exchanged an outstanding promissory note with a principal balance of \$200,000, plus accrued interest of \$16,800, for a convertible note with an aggregate principal amount of \$270,000 and an original issue discount of \$53,200 ("Exchange Note 2").

Exchange Note 2 is unsecured, has no applicable registration rights, bears interest at a rate of 12% per annum, matures on September 7, 2019 and contains standard and customary events of default including but not limited to: (i) failure to make payments when due under the Exchange Note, and (ii) bankruptcy or insolvency of the Company. Principal and interest are payable upon maturity.

BayBridge shall have the right, from and after the date of issuance of Exchange Note 2, and then at any time until Exchange Note 2 is fully paid, to convert any outstanding and unpaid principal and interest into shares of common stock at a variable conversion price equal to the lesser of (i) a price equal to \$0.15, or (ii) 70% of the lowest traded price for the shares over the prior five trading days.

Conversion to shares of common stock may not be issued pursuant to Exchange Note 2 if, after giving effect to the conversion or issuance, the holder together with its affiliates would beneficially own in excess of 9.99% of the outstanding shares of common stock.

As of December 31, 2018, aggregate principal of \$1,047,500 and interest of \$35,538 had been converted into 20,888,892 shares of common stock and no cash payments of principal or interest had been made on these exchange notes. Exchange Note 1 had been converted in full. The principal and accrued interest balances on Exchange note 2, as of December 31, 2018 were \$62,500 and \$220, respectively. The following table summarizes the conversion activity of these notes:

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Conversion Period	Principal Converted	Interest Converted	Common Shares Issued
Q4 2017	\$ 275,000	\$ —	404,412
Q1 2018	\$ 105,000	\$ 20,717	493,007
Q2 2018	\$ 408,000	\$ 6,090	2,435,823
Q3 2018	\$ 52,000	\$ 4,428	1,547,452
Q4 2018	\$ 207,500	\$ 4,303	16,008,198
	\$ 1,047,500	\$ 35,538	20,888,892

Pursuant to a number of factors outlined in ASC Topic 815, *Derivatives and Hedging*, the conversion options in these notes were deemed to include an embedded derivative that required bifurcation and separate accounting. As such, the Company ascertained the value of the conversion option as if separate from the convertible issuance and appropriately recorded that value as a derivative liability.

The following table summarizes the derivative liability transactions for these notes:

Derivative Liability Balance as of December 31, 2017	\$ 542,733
Additional derivative liability on new notes	276,179
Change in fair value of derivative liability	(677,380)
Liability extinguished	(27,686)
Derivative Liability Balance as of December 31, 2018	\$ 113,846

At December 31, 2017, the derivative liability associated with Exchange Note 1 was \$542,733. During the year ended December 31, 2018, the Company recorded a gain of \$515,047 as "Change in fair value of derivatives and gain/(loss) on extinguishment of liabilities, net" in the Consolidated Statements of Operations. As of December 31, 2018, Exchange Note 1 had been fully converted and the remaining derivative liability of \$27,686 was recorded as a gain to "Change in fair value of derivatives and gain/(loss) on extinguishment of liabilities, net" in the Consolidated Statements of Operations.

The conversion option in Exchange Note 2 was deemed to include an embedded derivative that required bifurcation and separate accounting. As such, the Company ascertained the value of the conversion option as if separate from the convertible issuance and appropriately recorded that value as a derivative liability. At September 7, 2018, the derivative liability associated with Exchange Note 2 was \$276,179.

The derivative liability associated with this note is subject to revaluation on a quarterly basis to reflect the market value change of the embedded conversion option. At December 31, 2018, the Company conducted a fair value assessment of the embedded derivative associated with the Exchange Note 2. As a result of the fair value assessment, the Company recorded a \$162,333 gain as "Change in fair value of derivatives and gain/(loss) on extinguishment of liabilities, net" in the Consolidated Statements of Operations for the year ended December 31, 2018 to properly reflect the fair value of the embedded derivative of \$113,846 as of December 31, 2018.

The fair value measurements rely primarily on company-specific inputs and the Company's own assumptions. With the absence of observable inputs, the Company determined these recurring fair value measurements reside primarily within Level 3 of the fair value hierarchy. The derivative associated with Exchange Note 2 approximates management's estimate of the fair value of the embedded derivative liability at December 31, 2018 based on using a Monte Carlo simulation following a Geometric Brownian Motion with the following assumptions: annual volatility of 74%, present value discount rate of 12% and dividend yield of 0%.

Bellridge Convertible Notes

On July 25, 2018, as described in Note 11, the Company, entered into a securities exchange agreement (the “Exchange Agreement”) with Bellridge Capital, LP (“Bellridge”). Pursuant to the terms of the Exchange Agreement, the investor agreed to surrender and exchange a promissory note with a principal balance of \$275,000 and accrued interest of \$20,071. In exchange, the Company issued to the investor an unsecured convertible note with an aggregate principal amount of \$300,000 (the “Exchange Note”). The original issue discount of \$4,929 was charged to interest expense upon issuance. The Exchange Note is not secured, bears interest at a rate of 12% per annum, and will mature on January 25, 2019; principal and interest on the Exchange Note are due upon maturity. The investor shall have the right, from and after the date of issuance of this note and then at any time until the note is fully paid, to convert any outstanding and unpaid principal into shares of the Company's common stock at a variable conversion price equal to the lesser of (i) a price equal to \$0.20, or (ii) 80% of the lowest traded price for the shares over the prior ten trading days.

On September 14, 2018, the Company, issued a new \$150,000 convertible note in a private placement to Bellridge. The note is not secured, contains no registration rights, bears interest at a rate of 12% per annum, will mature on September 14, 2019, and contains standard and customary events of default including but not limited to: (i) failure to make payments when due under the note, and (ii) bankruptcy or insolvency of the Company. All principal and interest on the note are due upon maturity. Bellridge shall have the option to convert all or a portion of the amounts outstanding under the note, into shares of the Company's common stock. Conversions into common stock shall be calculated using a variable conversion price equal to the lesser of (i) \$0.20 or (ii) 70% of the lowest closing bid price for the shares over the prior five day trading period immediately preceding the conversion.

On October 18, 2018, as discussed in Note 10, Global assigned one of its notes to Bellridge. The note had an outstanding principal balance of \$250,000 and an accrued interest balance of \$26,466. The note matures on October 18, 2019, and all principal and interest is due upon maturity. The principal and accrued interest on the note are redeemable at any time, in whole or in part, at the option of Bellridge. The redemption amount may be paid in cash or converted into shares of common stock at a variable conversion price equal to the lowest of (i) 85% of the average VWAP for the shares over the prior five trading days, (ii) the closing bid price for the shares on the prior trading day, or (iii) \$0.20 per share, at the option of the Company.

Shares of common stock may not be issued pursuant to any of these notes if, after giving effect to the conversion or issuance, the holder together with its affiliates would beneficially own in excess of 4.99% of the outstanding shares of Common Stock.

As of December 31, 2018, an aggregate principal of \$245,000 and interest of \$6,104, on the Bellridge convertible notes had been converted into 11,269,875 shares of common stock and no cash payments of principal or interest had been made. The aggregate principal and accrued interest balances as of December 31, 2018 were \$455,000 and \$40,997, respectively. The following table summarizes the conversion activity of these notes:

Conversion Period	Principal Converted		Interest Converted		Common Shares Issued
Q3 2018	\$	137,500	\$	2,104	3,715,476
Q4 2018	\$	107,500	\$	4,000	7,554,399
	\$	245,000	\$	6,104	11,269,875

Pursuant to a number of factors outlined in ASC Topic 815, *Derivatives and Hedging*, the conversion option in these convertible notes were deemed to include an embedded derivative that required bifurcation and separate accounting. As such, the Company ascertained the value of the conversion option as if separate from the convertible issuance and appropriately recorded that value as a derivative liability.

The following table summarizes the derivative liability transactions for this note:

Derivative Liability Balance as of December 31, 2017	\$	—
Additional derivative liability on new notes		236,004
Derivative liability assigned		119,039
Change in fair value of derivative liability		131,236
Derivative Liability Balance as of December 31, 2018	\$	486,279

The conversion option in the Exchange Note was deemed to include an embedded derivative that required bifurcation and separate accounting. As such, the Company ascertained the value of the conversion option as if separate from the convertible issuance and appropriately recorded that value as a derivative liability. At July 25, 2018, the derivative liability associated with the Exchange Note was \$203,859.

The conversion option in the new convertible note was deemed to include an embedded derivative that required bifurcation and separate accounting. As such, the Company ascertained the value of the conversion option as if separate from the convertible issuance and appropriately recorded that value as a derivative liability. At September 14, 2018, the derivative liability associated with the convertible note was \$32,145.

The conversion option in the assigned convertible note was deemed to include an embedded derivative that required bifurcation and separate accounting. As such, the Company ascertained the value of the conversion option as if separate from the convertible issuance and appropriately recorded that value as a derivative liability. At October 18, 2018, the derivative liability associated with the convertible note was \$119,039.

The derivative liability associated with these notes is subject to revaluation on a quarterly basis to reflect the market value change of the embedded conversion option. At December 31, 2018, the Company conducted a fair value assessment of the embedded derivative associated with the notes. As a result of the fair value assessment, the Company recorded a \$131,236 loss as "Change in fair value of derivatives and gain/(loss) on extinguishment of liabilities, net" in the Consolidated Statements of Operations for the year ended December 31, 2018 to properly reflect the fair value of the embedded derivative of \$486,279 as of December 31, 2018.

The fair value measurements rely primarily on Company-specific inputs and the Company's own assumptions. With the absence of observable inputs, the Company determined these recurring fair value measurements reside primarily within Level 3 of the fair value hierarchy. The derivative associated with the notes approximates management's estimate of the fair value of the embedded derivative liability at December 31, 2018 based on using a Monte Carlo simulation following a Geometric Brownian Motion with the following assumptions: annual volatility between 40% and 74%, present value discount rate of 12% and dividend yield of 0%.

PowerUp Convertible Notes

On August 1, 2018, the Company, entered into a securities purchase agreement with Power Up Lending Group LTD, for the private placement of a \$130,000 convertible note. This note is unsecured, bears interest at a rate of 8% per annum, and matures on August 1, 2019; principal and interest is due upon maturity. In the event of default, the interest rate per annum increases to 22%.

Beginning in February 2019, Power Up shall have the option to convert all or a portion of the amounts outstanding under the convertible note, into shares of the Company's common stock. Conversions into common stock shall be calculated using a variable conversion price equal to 65% of the average of the three lowest closing bid prices for the shares over the prior ten day trading period immediately preceding the conversion.

On September 4, 2018, the Company entered into a second securities purchase agreement with Power Up, for the private placement of a second convertible note with a principal value of \$52,500. This note is unsecured, bears interest at a rate of 8% per annum, and matures on September 4, 2019; principal and interest is due upon maturity. In the event of default, the interest rate per annum increases to 22%.

Beginning in March 2019, Power Up shall have the option to convert all or a portion of the amounts outstanding under the convertible note, into shares of the Company's common stock. Conversions into common stock shall be calculated using a variable conversion price equal to 65% of the average of the three lowest trading prices for the shares over the prior ten day trading period immediately preceding the conversion.

On October 17, 2018, the Company entered into a second securities purchase agreement with Power Up, for the private placement of a third convertible note with a principal value of \$42,500. This note is unsecured, bears interest at a rate of 8% per annum, and matures on October 16, 2019; principal and interest is due upon maturity. In the event of default, the interest rate per annum increases to 22%.

Beginning in April 2019, Power Up shall have the option to convert all or a portion of the amounts outstanding under the convertible note, into shares of the Company's common stock. Conversions into common stock shall be calculated using a variable conversion price equal to 65% of the average of the three lowest trading prices for the shares over the prior ten day trading period immediately preceding the conversion.

Shares of common stock may not be issued pursuant to any of these notes if, after giving effect to the conversion or issuance, the holder together with its affiliates would beneficially own in excess of 4.99% of the outstanding shares of Common Stock.

As of December 31, 2018, no principal or interest had been converted into shares of common stock and no cash payments of principal or interest had been made. The aggregate principal and accrued interest balances as of December 31, 2018 were \$225,000 and \$6,388, respectively.

The following table summarizes the derivative liability transactions for this note:

Derivative Liability Balance as of December 31, 2017	\$	—
Additional derivative liability on new notes		246,860
Change in fair value of derivative liability		264,277
Derivative Liability Balance as of December 31, 2018	\$	511,137

Pursuant to a number of factors outlined in ASC Topic 815, *Derivatives and Hedging*, the conversion option in the first note was deemed to include an embedded derivative that required bifurcation and separate accounting. As such, the Company ascertained the value of the conversion option as if separate from the convertible issuance and appropriately recorded that value as a derivative liability. At August 1, 2018, the derivative liability associated with the first note was \$78,382.

The conversion option in the second note was deemed to include an embedded derivative that required bifurcation and separate accounting. As such, the Company ascertained the value of the conversion option as if separate from the convertible issuance and appropriately recorded that value as a derivative liability. At September 4, 2018, the derivative liability associated with the second note was \$128,613.

The conversion option in the third note was deemed to include an embedded derivative that required bifurcation and separate accounting. As such, the Company ascertained the value of the conversion option as if separate from the convertible issuance and appropriately recorded that value as a derivative liability. At October 17, 2018, the derivative liability associated with the second note was \$39,865.

The derivative liability associated with these notes is subject to revaluation on a quarterly basis to reflect the market value change of the embedded conversion option. At December 31, 2018, the Company conducted a fair value assessment of the embedded derivative associated with the notes. As a result of the fair value assessment, the Company recorded a \$264,277 loss as "Change in fair value of derivatives and gain/(loss) on extinguishment of liabilities, net" in the Consolidated Statements of Operations for the year ended December 31, 2018 to properly reflect the fair value of the embedded derivative of \$511,137 as of December 31, 2018.

The fair value measurements rely primarily on company-specific inputs and the Company's own assumptions. With the absence of observable inputs, the Company determined these recurring fair value measurements reside primarily within Level 3 of the fair value hierarchy. The derivative associated with the convertible notes approximates management's estimate of the fair value of the embedded derivative liability at December 31, 2018 based on using a Monte Carlo simulation following a Geometric Brownian Motion with the following assumptions: annual volatility between 70% and 76%, present value discount rate of 12% and dividend yield of 0%.

EMA Convertible Note

On August 29, 2018, the Company entered into a securities purchase agreement with EMA Financial, LLC, for the private placement of a \$75,000 convertible note. The note is unsecured, bears interest at a rate of 8% per annum, and matures on May 29, 2019; principal and interest is due upon maturity. In the event of default, the interest rate per annum increases to 22%.

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Beginning in March 2019, EMA shall have the option to convert all or a portion of the amounts outstanding under the note, into shares of the Company's Common Stock. Conversions into Common Stock shall be calculated using a variable conversion price equal to 65% of the average of the three lowest closing bid prices for the shares over the prior ten day trading period immediately preceding the conversion.

Shares of common stock may not be issued pursuant to the note if, after giving effect to the conversion or issuance, the holder together with its affiliates would beneficially own in excess of 4.99% of the outstanding shares of common stock.

As of December 31, 2018, no principal or interest had been converted into shares of common stock and no cash payments of principal or interest had been made. The principal and accrued interest balances as of December 31, 2018 were \$75,000 and \$2,038, respectively.

The following table summarizes the derivative liability transactions for this note:

Derivative Liability Balance as of December 31, 2017	\$	—
Additional derivative liability on new notes		3,945
Change in fair value of derivative liability		236,211
Derivative Liability Balance as of December 31, 2018	\$	240,156

Pursuant to a number of factors outlined in ASC Topic 815, *Derivatives and Hedging*, the conversion option in the note was deemed to include an embedded derivative that required bifurcation and separate accounting. As such, the Company ascertained the value of the conversion option as if separate from the convertible issuance and appropriately recorded that value as a derivative liability. At August 29, 2018, the derivative liability associated with the note was \$3,945.

The derivative liability associated with the note is subject to revaluation on a quarterly basis to reflect the market value change of the embedded conversion option. At December 31, 2018, the Company conducted a fair value assessment of the embedded derivative associated with the note. As a result of the fair value assessment, the Company recorded a \$236,211 loss as "Change in fair value of derivatives and gain/(loss) on extinguishment of liabilities, net" in the Consolidated Statements of Operations for the year ended December 31, 2018 to properly reflect the fair value of the embedded derivative of \$240,156 as of December 31, 2018.

The fair value measurements rely primarily on Company-specific inputs and the Company's own assumptions. With the absence of observable inputs, the Company determined these recurring fair value measurements reside primarily within Level 3 of the fair value hierarchy. The derivative associated with the Notes approximates management's estimate of the fair value of the embedded derivative liability at December 31, 2018 based on using a Monte Carlo simulation following a Geometric Brownian Motion with the following assumptions: annual volatility of 87%, present value discount rate of 12% and dividend yield of 0%.

Subsequent to the date of this report, the Company conducted additional transactions with convertible notes. Please refer to Note 21 for more information.

NOTE 13. SERIES A PREFERRED STOCK

In June 2013, the Company entered into a Securities Purchase Agreement with an investor to sell an aggregate of \$750,000 shares of Series A Preferred Stock at a price of \$8.00 per share, resulting in gross proceeds of \$6,000,000. This purchase agreement included warrants to purchase up to 13,125 shares of common stock of the Company. The transfer of cash and securities took place incrementally, the first closing occurring on June 17, 2013 with the transfer of 125,000 shares of Series A Preferred Stock and a warrant to purchase 2,187 shares of common stock for \$1,000,000. The final closings took place in August 2013, with the transfer of 625,000 shares of Series A Preferred Stock and a warrant to purchase 10,938 shares of common stock for \$5,000,000.

Holders of Series A Preferred Stock are entitled to cumulative dividends at a rate of 8% per annum when and if declared by the Board of Directors in its sole discretion. The dividends may be paid in cash or in the form of common stock (valued at 10% below market price, but not to exceed the lowest closing price during the applicable measurement period), at the discretion of the Board of Directors. The dividend rate on the Series A Preferred Stock is indexed to the Company's stock price and subject to adjustment. In addition, the Series A Preferred Stock contains a make-whole provision whereby, conversion or redemption of the preferred stock within 4 years of issuance will require dividends for the full four year period to be paid by the Company in cash or common stock (valued at 10% below market price, but not to exceed the lowest closing price during the applicable measurement period). This make-whole provision expired in June 2017.

The Series A Preferred Stock may be converted into shares of common stock at the option of the Company if the closing price of the common stock exceeds \$232 , as adjusted, for twenty consecutive trading days, or by the holder at any time. The Company has the right to redeem the Series A Preferred Stock at a price of \$8.00 per share, plus any accrued and unpaid dividends, plus the make-whole amount (if applicable). At December 31, 2018 , the preferred shares were not eligible for conversion to common shares at the option of the Company. The holder of the preferred shares may convert to common shares at any time, at no cost, at a ratio of 1 preferred share into 1 common share (subject to standard ratable anti-dilution adjustments). Upon any conversion (whether at the option of the Company or the holder), the holder is entitled to receive any accrued but unpaid dividends.

On October 6, 2016, the Series A Holder entered into an exchange agreement with a private investor. Pursuant to the exchange agreement, beginning December 5, 2016, the investor has the option to exchange, from time to time, all or any portion of the October 2016 Convertible Notes (see Note 12) for outstanding shares of Series A Preferred Stock from the Series A Holder.

As of March 31, 2017, the investor had elected to exchange all outstanding October 2016 Convertible Notes, in accordance with the exchange agreement, resulting in the exchange of 104,785 shares of Series A Preferred Stock. As of March 31, 2017, the investor had also converted their 104,785 shares of Series A Preferred Stock, and the related make whole dividend, which resulted in the issuance of 173,947 shares of common stock.

Except as otherwise required by law (or with respect to approval of certain actions), the Series A Preferred Stock shall have no voting rights. 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 per share of Series A Preferred Stock plus any accrued and unpaid dividends.

During the year ended December 31, 2018 , there was no activity for the Series A Preferred Stock. As of December 31, 2018 , there were 60,756 shares of Series A Preferred Stock outstanding and accrued and unpaid dividends of \$341,415 .

Subsequent to the date of this report, the Company conducted additional transactions with Series A Preferred Stock. Please refer to Note 21 for more information.

NOTE 14. SERIES K PREFERRED STOCK

On February 8, 2017, the Company, entered into a securities purchase agreement (“Series K SPA”) with a private investor, for the private placement of up to 20,000,000 of the Company’s newly designated Series K Convertible Preferred Stock (“Series K Preferred Stock”).

Per the terms of the Series K SPA, the Company was scheduled to sell 1,000 shares of Series K Preferred Stock to the investor in exchange for \$1,000,000 of gross proceeds on or before each of (i) February 24, 2017, (ii) March 27, 2017, (iii) April 27, 2017, (iv) May 27, 2017 and (v) June 27, 2017. The Company was also scheduled to sell 15,000 shares of Series K Preferred Stock to the investor in exchange for \$15,000,000 of gross proceeds on or before July 27, 2017. As of December 31, 2018 , the Company had sold 9,010 shares of Series K Preferred Stock in exchange for \$9,010,000 in cash proceeds from the private investor. The Company does not expect to receive any more funding from this investor. The following summarizes the closings and proceeds received as of December 31, 2018:

Preferred Series K Shares		Closing Amount
Closing Period	Purchased	
Q1 2017	150 \$	150,000
Q2 2017	4,100 \$	4,100,000
Q3 2017	4,760 \$	4,760,000
	9,010 \$	9,010,000

The Series K Preferred Stock ranks senior to the Company’s common stock in respect to dividends and rights upon liquidation. The Series K Preferred Stock will not have voting rights and the holders of the Series K Preferred Stock will not be entitled to any fixed rate of dividends.

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The shares of the Series K Preferred Stock will be convertible at the option of the holder into common stock at a fixed conversion price equal to \$4.00 . At no time may the Series K Preferred Stock be converted if the number of shares of common stock to be received by Investor pursuant to such conversion, when aggregated with all other shares of common stock then beneficially (or deemed beneficially) owned by Investor, would result in Investor beneficially owning more than 19.99% of all common stock then outstanding. As of December 31, 2018 , the investor had converted all of the Series K Preferred Stock into shares of common stock. The following table summarizes the conversion activity of Series K Preferred Stock:

Conversion Period	Preferred Series K Shares Converted	Value of Series K Preferred Shares	Common Shares Issued
Q2 2017	3,200	\$ 3,200,000	800,000
Q3 2017	3,000	\$ 3,000,000	750,000
Q2 2018	2,810	\$ 2,810,000	702,500
	9,010	\$ 9,010,000	2,252,500

As of December 31, 2018 , the investor owned approximately 4% of the Company's outstanding common stock.

Upon issuance, in accordance with ASC 480-10, the Series K Preferred Stock was classified as a liability on the 2017 Consolidated Balance Sheet. Pursuant to a number of factors outlined in ASC Topic 815, the conversion option in the Series K Preferred Stock was deemed to not require bifurcation or separate accounting treatment.

NOTE 15. STOCKHOLDERS' EQUITY (DEFICIT)*Common Stock***Reverse Stock Split**

On July 19, 2018, the Company, filed a Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the Company (the "Certificate of Amendment") with the Secretary of State of the State of Delaware to effect a reverse stock split of the Company's common stock, at a ratio of one-for-one thousand (the "Reverse Stock Split").

The Certificate of Amendment provides that the Reverse Stock Split became effective as of 5:00 p.m. Eastern Time on July 20, 2018 (the "Effective Time"), at which time every thousand shares of the Company's issued and outstanding Common Stock were automatically combined into one issued and outstanding share of Common Stock, without any change in the par value per share. The Certificate of Amendment provides that in the event a stockholder would otherwise be entitled to receive a fraction of a share of Common Stock, such stockholder shall receive one whole share of Common Stock in lieu of such fractional share and no fractional shares shall be issued.

Immediately following the Reverse Stock Split, the Company had approximately 19 million shares of Common Stock issued and outstanding. The number of authorized shares of the Company's Common Stock remains at 20 billion . The number of shares of the Company's Series A preferred stock outstanding was not affected by the Reverse Stock Split. However, the number of shares of Common Stock into which each outstanding share of Series A preferred stock is convertible will be adjusted proportionately as a result of the Reverse Stock Split. All outstanding RSUs, stock options, warrants and rights to purchase shares of Common Stock was adjusted proportionately.

Trading of the Company's Common Stock continued on the OTC Marketplace on a split-adjusted basis on July 23, 2018.

At December 31, 2018 , the Company had 20 billion shares of common stock, \$0.0001 par value, authorized for issuance. Each share of common stock has the right to one vote. As of December 31, 2018 , the Company had 63,537,885 shares of common stock outstanding. The Company has not declared or paid any dividends related to the common stock through December 31, 2018 .

Preferred Stock

At December 31, 2018 , the Company had 25,000,000 shares of preferred stock, \$0.0001 par value, authorized for issuance. Preferred stock may be issued in classes or series. Designations, powers, preferences, rights, qualifications, limitations and restrictions are determined by the Company's Board of Directors. The following table summarizes the designations, shares authorized, and shares outstanding for the Company's Preferred Stock:

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Preferred Stock Series Designation	Shares Authorized	Shares Outstanding
Series A	750,000	60,756
Series B-1	2,000	—
Series B-2	1,000	—
Series C	1,000	—
Series D	3,000	—
Series D-1	2,500	—
Series E	2,800	—
Series F	7,000	—
Series G	2,000	—
Series H	2,500	—
Series I	1,000	—
Series J	1,350	—
Series J-1	1,000	—
Series K	20,000	—

Series A Preferred Stock

Refer to Note 13 for Series A Preferred Stock activity.

Series B-1, B-2, C, D, D-1, H, and I Preferred Stock

There were no transactions involving the Series B-1, B-2, C, D, D-1, H, or I during the years ended December 31, 2017 and December 31, 2018 .

Series E Preferred Stock

During the year ended December 31, 2017 , the Company converted 120 shares of Series E Preferred Stock, a capital value of \$120,000 , and dividends of \$11,948 , for 272,532 shares of common stock. There was no Series E Preferred Stock activity during the year ended December 31, 2018 .

Series F Preferred Stock

During the year ended December 31, 2017 , the Company converted 160 shares of Series F Preferred Stock, a capital value of \$160,000 , and dividends of \$467 , for 190,735 shares of common stock. There was no Series F Preferred Stock activity during the year ended December 31, 2018 .

Series G Preferred Stock

During the year ended December 31, 2017 , the Company converted 898 shares of Series G Preferred Stock, a capital value of \$898,000 , and dividends of \$75,066 , for 1,665,496 shares of common stock. There was no Series G Preferred Stock activity during the year ended December 31, 2018 .

Series J Preferred Stock

During the year ended December 31, 2017 , the Company converted 275 shares of Series J Preferred Stock, a capital value of \$275,000 , and dividends of \$15,063 , for 386,551 shares of common stock. Also, during the year ended December 31, 2017 , the Company redocumented 1,075 shares of Series J Preferred Stock, a capital value of \$1,075,000 , and dividends of \$125,639 as convertible notes. Please refer to Notes 10 and 12 for further information. There was no Series J Preferred Stock activity during the year ended December 31, 2018 .

Series J-1 Preferred Stock

During the year ended December 31, 2017, the Company converted 700 shares of Series J-1 Preferred Stock, a capital value of \$700,000, and dividends of \$55,305, for 500,000 shares of common stock. There was no Series J-1 Preferred Stock activity during the year ended December 31, 2018.

Series K Preferred Stock

Refer to Note 14 for Series K Preferred Stock activity.

Warrants

On July 24, 2017, the Company issued a warrant for 250,000 shares of common stock, in connection with a settlement agreement with a consultant. The warrant is exercisable at a fixed exercise price of \$4, on the issuance date through the first anniversary of the issuance date. The warrant may not be exercised if, after giving effect to the exercise, the holder, together with its affiliates, would beneficially own in excess of 9.99% of the Company's outstanding shares of common stock.

The Company conducted a fair value assessment of the warrant upon issuance using a Black Scholes model with the following inputs: stock price on the date of issuance of \$0.70, stock volatility of 234%, and a risk free rate of 1.23%. Using these parameters, the Company calculated a fair value of \$88,937 and recorded a corresponding expense on the Company's consolidated and statement of operations. As of December 31, 2018, these warrants have expired.

On August 10, 2017, the Company issued a warrant for 250,000 shares of common stock in connection with a preferred stock redemption agreement. The warrant is exercisable, at a fixed exercise price of \$3, on the issuance date through the first anniversary of the issuance date. The Warrant may not be exercised if, after giving effect to the exercise, the holder, together with its affiliates, would beneficially own in excess of 9.99% of the Company's outstanding shares of common stock.

The Company conducted a fair value assessment of the warrant upon issuance using a Black Scholes model with the following inputs: stock price on the date of issuance of \$1.50, stock volatility of 230%, and a risk free rate of 1.22%. Using these parameters, the Company calculated a fair value of \$246,803 and recorded a corresponding expense on the Company's consolidated and statement of operations. As of December 31, 2018, these warrants have expired.

On December 15, 2017, the Company issued a warrant for 200,000 shares of common stock in connection with a consulting agreement. The warrant is exercisable, at a fixed exercise price of \$1.8, on the issuance date through the June 30, 2018. The Warrant may not be exercised if, after giving effect to the exercise, the holder, together with its affiliates, would beneficially own in excess of 9.99% of the Company's outstanding shares of common stock.

The Company conducted a fair value assessment of the warrant upon issuance using a Black Scholes model with the following inputs: stock price on the date of issuance of \$0.80, stock volatility of 99%, and a risk free rate of 1.48%. Using these parameters, the Company calculated a fair value of \$10,035 and recorded a corresponding expense on the Company's consolidated statement of operations. As of December 31, 2018, these warrants have expired.

The following table summarizes warrant activity:

	Warrant Shares	Warrant Weighted Average Exercise Price
Outstanding at December 31, 2016	—	\$ —
Granted	700,000	\$ 3.01
Exercised	—	\$ —
Canceled/Expired	—	\$ —
Outstanding at December 31, 2017	700,000	\$ 3.01
Granted	—	\$ —
Exercised	\$ —	\$ —
Canceled/Expired	(700,000)	\$ 3.01
Outstanding at December 31, 2018	—	\$ —
Exercisable at December 31, 2018	—	\$ —

NOTE 16. EQUITY PLANS AND SHARE-BASED COMPENSATION

Stock Option Plan: The Company's 2005 Stock Option Plan, as amended (the "Stock Option Plan") provides for the grant of incentive or non-statutory stock options to the Company's employees, directors and consultants. The stock Option Plan initially reserved 170,000 shares of the Company's common stock for option awards to eligible employees. Upon recommendation of the Board of Directors, the stockholders approved an increase in the total shares of common stock reserved for issuance under the Stock Option Plan to 270,000 during 2015. There were no changes to the plan in 2017 or 2018.

Restricted Stock Plan: The Company's 2008 Restricted Stock Plan, as amended (the "Restricted Stock Plan") was adopted by the Board of Directors and was approved by the stockholders on July 1, 2008. The Restricted Stock Plan initially reserved up to 75,000 shares of the Company's common stock for restricted stock awards and restricted stock units to eligible employees, directors and consultants of the Company. Upon recommendation of the Board of Directors, the stockholders approved an increase in the total shares of common stock reserved for issuance under the Restricted Stock Plan to 125,000 and 750,000 shares during 2015 and 2016, respectively. There were no changes to the plan in 2017 or 2018.

The Stock Option Plan and the Restricted Stock Plan are administered by the Compensation Committee of the Board of Directors, which determines the terms of the option and share awards, including the exercise price, expiration date, vesting schedule and number of shares. The term of any incentive stock option granted under the Stock Option Plan may not exceed ten years, or five years for options granted to an optionee owning more than 10% of the Company's voting stock. The exercise price of an incentive stock option granted under the Option Plan must be equal to or greater than the fair market value of the shares of the Company's common stock on the date the option is granted. An incentive stock option granted to an optionee owning more than 10% of the Company's voting stock must have an exercise price equal to or greater than 110% of the fair market value of the Company's common stock on the date the option is granted. The exercise price of a non-statutory option granted under the Option Plan must be equal to or greater than 85% of the fair market value of the shares of the Company's common stock on the date the option is granted.

Share-Based Compensation: The Company measures share-based compensation cost at the grant date based on the fair value of the award and recognizes this cost as an expense over the grant recipients' requisite service periods for all awards made to employees, officers, directors and consultants.

The share-based compensation expense recognized in the Consolidated Statements of Operations was as follows:

	For year ended December 31,	
	2018	2017
Research and development	\$ 642	\$ 18,231
Selling, general and administrative	\$ 28,623	\$ 105,037
Total share-based compensation cost	\$ 29,265	\$ 123,268

ASCENT SOLAR TECHNOLOGIES, INC.

The following table presents share-based compensation expense by type:

	For year ended December 31,	
	2018	2017
Type of Award:		
Stock Options	\$ 29,265	\$ 96,938
Restricted Stock Units and Awards	\$ —	\$ 26,330
Total share-based compensation cost	\$ 29,265	\$ 123,268

Stock Options: The Company recognized share-based compensation expense for stock options of \$29,265 to officers, directors and employees for the year ended December 31, 2018 related to stock option awards, reduced for estimated forfeitures. There were no option grants during the years ended December 31, 2018 or December 31, 2017 .

As of December 31, 2018 , total compensation cost related to non-vested stock options not yet recognized was \$9,578 which is expected to be recognized over a weighted average period of approximately 0.46 years . As of December 31, 2018 , 109 shares were vested or expected to vest in the future and 107 shares remained available for future grants under the Option Plan.

The following table summarizes stock option activity within the Stock Option Plan:

	Stock Option Shares	Weighted Average Remaining Contractual Life in Years
Outstanding at December 31, 2016	250	8.28
Granted	—	
Exercised	—	
Canceled	(55)	
Outstanding at December 31, 2017	195	7.32
Granted	—	
Exercised	—	
Canceled	(85)	
Outstanding at December 31, 2018	110	5.18
Exercisable at December 31, 2018	105	5.13

Restricted Stock: The Company did not recognized share-based compensation expense related to restricted stock grants for the year ended December 31, 2018 . During the year ended December 31, 2017 , the Company recognized approximately \$26,000 in share-based compensation related to restricted stock grants. There were no restricted stock grants for the years ended December 31, 2018 and December 31, 2017 .

As of December 31, 2018 , there was no unrecognized share-based compensation expense from unvested restricted stock, no shares were expected to vest in the future, and 496 shares remained available for future grants under the Restricted Stock Plan.

NOTE 17. INCOME TAXES

The company record income taxes using the liability method. Under this method, deferred tax assets and are computed for the expected future impact of temporary differences between the financial statement and income tax bases of assets and liabilities using current income tax rates and for the expected future tax benefit to be derived from tax loss and tax credit carryforwards. ASC 740 provides detailed guidance for the financial statement recognition, measurement and disclosure of uncertain tax positions recognized in the financial statements. Tax positions must meet a "more-likely-than-not" recognition threshold before a benefit is recognized in the financial statements.

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At December 31, 2018, the Company had \$255,470,676 of cumulative net operating loss carryforwards for federal income tax purposes that were available to offset future taxable income through the year 2308. Under the Internal Revenue Code, the future utilization of net operating losses may be limited in certain circumstances where there is a significant ownership change. The Company prepared an analysis for the year ended December 31, 2012 and determined that a significant change in ownership had occurred as a result of the cumulative effect of the sales of common stock through its offerings. Such change limited the Company's utilizable net operating loss carryforwards to \$255,470,676 for the year ended December 31, 2018. Available net operating loss carryforwards may be further limited in the event of another significant ownership change.

Deferred income taxes reflect an estimate of the cumulative temporary differences recognized for financial reporting purposes from that recognized for income tax reporting purposes. At December 31, 2018 and 2017, the components of these temporary differences and the deferred tax asset were as follows:

	As of December 31	
	2018	2017
Deferred Tax Asset		
Accrued Expenses	\$ 30,000	\$ —
Inventory Allowance	\$ 184,000	\$ 141,000
Other	\$ 11,000	\$ 13,000
Stock Based Compensation-Stock Options and Restricted Stock	\$ 1,021,000	\$ 1,058,000
Tax effect of NOL carryforward	\$ 64,519,000	\$ 67,852,000
Depreciation	\$ 5,957,000	\$ 8,748,000
Amortization	\$ (213,000)	\$ (368,000)
Disallowed interest expense	\$ 452,000	\$ —
Warranty reserve	\$ 7,000	\$ 14,000
Net deferred tax asset	\$ 71,968,000	\$ 77,458,000
Less valuation allowance	\$ (71,968,000)	\$ (77,458,000)
Net deferred tax asset	\$ —	\$ —

In assessing the realizability of deferred tax assets, management considers whether it is more likely than not that some portion or all of the deferred tax assets will be realized. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the periods in which those temporary differences become deductible. Management considers the scheduled reversal of deferred tax liabilities, projected future taxable income and tax planning strategies in making this assessment. Based upon the level of historical losses and projections of future taxable income over the periods in which the deferred tax assets are deductible, management believes it is not more-likely-than-not that the Company will realize the benefits of these deductible differences at December 31, 2018. The Company's deferred tax valuation allowance of \$71,968,000 reflected above is a decrease of \$5,490,000 from the valuation allowance reflected as of December 31, 2017 of \$77,458,000.

As of December 31, 2018, the Company has not recorded a liability for uncertain tax positions. The Company recognizes interest and penalties related to uncertain tax positions in income tax (benefit)/expense. No interest and penalties related to uncertain tax positions were accrued at December 31, 2018.

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The Company's effective tax rate for the years ended December 31, 2018 and 2017 differs from the statutory rate due to the following (expressed as a percentage of pre-tax income):

	2018	2017
Federal statutory rate	21.0 %	35.0 %
State statutory rate	3.6 %	2.8 %
Change in rate	(0.8)%	— %
Permanent tax differences	(0.1)%	(2.3)%
Derivative/Warrant Revaluation	— %	8.4 %
Debt Discount	— %	(5.5)%
Loss on Extinguishment of Liabilities	(3.5)%	(4.9)%
Deferred true-ups	(54.2)%	— %
Other	— %	(0.9)%
Change in valuation allowance	34.0 %	(32.6)%
	— %	— %

NOTE 18. RELATED PARTY TRANSACTIONS

On August 29, 2016, the Company entered into a note purchase agreement with Tertius Financial Group Pte. Ltd. ("TFG") for the private placement of \$330,000 of the Company's original issue discount notes with an original maturity date of November 29, 2016. The notes bear interest of 6% per annum and principal and interest on the notes are payable upon maturity. The notes are unsecured and not convertible into equity shares of the Company.

On December 6, 2016, the Company issued a new \$600,000 original issue discount note to TFG in exchange for (i) \$200,000 of additional gross proceeds and (ii) cancellation of the existing outstanding \$330,000 note. The new TFG note bears interest at a rate of 6% per annum and matures on December 31, 2017. Principal and interest on the new TFG note is payable at maturity. Following the transaction, the outstanding balance of the new note was \$602,000 (including accrued and unpaid interest) with a discount of \$60,000.

On January 19, 2017, the Company issued 333,334 shares of unregistered common stock in a private placement to TFG pursuant to a Securities Purchase Agreement (the "SPA").

Pursuant to the SPA, the Company issued the 333,334 shares to TFG in exchange for cancellation of its \$600,000 promissory note (including accrued interest of approximately \$4,340) that was issued by the Company on December 6, 2016. The SPA does not provide any registration rights for the shares issued to TFG.

TFG is a Singapore based entity controlled and 50% owned by Ascent's President & CEO, Victor Lee, and owns approximately 1% of the Company's outstanding shares at December 31, 2018.

All related party transactions were approved by our independent board of directors.

NOTE 19. COMMITMENTS AND CONTINGENCIES

The Company is subject to various legal proceedings, both asserted and unasserted, that arise in the ordinary course of business. The Company cannot predict the ultimate outcome of such legal proceedings or in certain instances provide reasonable ranges of potential losses. However, as of the date of this report, the Company believes that none of these claims will have a material adverse effect on its consolidated financial position or results of operations. In the event of unexpected subsequent developments and given the inherent unpredictability of these legal proceedings, there can be no assurance that the Company's assessment of any claim will reflect the ultimate outcome, and an adverse outcome in certain matters could, from time to time, have a material adverse effect on the Company's consolidated financial position or results of operations in particular quarterly or annual periods.

NOTE 20. RETIREMENT PLAN

On July 1, 2006, the Company adopted a qualified 401(k) plan which provides retirement benefits for all of its eligible employees. Under the plan, employees become eligible to participate at the first entry date, provided they are at least 21 years of age. The participants may elect through salary reduction to contribute up to ceilings established in the Internal Revenue Code. The Company will match 100% of the first six percent of employee contributions. In addition, the Company may make discretionary contributions to the Plan as determined by the Board of Directors. Employees are immediately vested in all salary reduction contributions. Rights to benefits provided by the Company's discretionary and matching contributions vest 100% after the first year of service for all employees hired before January 1, 2010. For employees hired after December 31, 2009, matching contributions vest over a three -year period, one-third per year. Payments for 401(k) matching totaled \$108,776 and \$199,669 for the years ended December 31, 2018 and 2017, respectively. Payments for 401(k) matching are recorded under "Research, development and manufacturing operations" expense and "Selling, general and administrative" expense in the Consolidated Statements of Operations.

NOTE 21. SUBSEQUENT EVENTS**Offering of Secured Promissory Note**

Between January 3, 2019 and February 8, 2019, in four tranches, the Company received the remaining \$400,000 proceeds related to the securities purchase agreement, dated November 5, 2018, with St. George (Note 10). As a result the principal balance of this secured convertible note is \$1,220,000 as of the filing date of this report.

On March 13, 2019, the Company entered into a securities purchase agreement with St. George (Note 10), for the private placement of an additional \$365,000 secured convertible promissory note.

The note, bears interest at 10% per annum, matures on March 15, 2020, and contains standard and customary events of default including but not limited to: (i) failure to make payments when due under the note, and (ii) bankruptcy or insolvency of the Company. Principal and interest on the note will be payable upon maturity. The interest rate increases to 22% in the event of a default under the note.

Beginning six months after the date of issue, St. George shall have the option to redeem all or a portion of the amounts outstanding under the note. At St. George's option, redemption amounts are payable by the Company in the form of (x) cash or (y) conversion of such amounts into shares of the Company's common stock. Conversions into common stock shall be calculated using a variable conversion price equal to 60% of the average of the two lowest closing bid price for the shares over the prior ten day trading period immediately preceding the conversion.

There are no registration rights applicable to the note or its underlying conversion shares. Shares of common stock may not be issued pursuant to the note if, after giving effect to the conversion or issuance, the holder together with its affiliates would beneficially own in excess of 9.99% of the outstanding shares of the Company's common stock.

The note will be secured by a security interest on the Company's headquarters building in Thornton, Colorado.

Conversions of Secured Promissory Notes (Note 10)

Subsequent to the date of this report, an additional \$115,000 in principal for Global was converted into 9,595,327 shares of common stock.

Offering of Promissory Note (Note 11)

On March 11, 2019, the Company issued, to Investor 3, a additional promissory note with a principal balance of \$60,000 in exchange for \$50,000 in gross proceeds. The note is unsecured, bears interest at 12% per annum, matures on September 11, 2019, and contains standard and customary events of default including but not limited to: (i) failure to make payments when due under the note, and (ii) bankruptcy or insolvency of the Company. Principal and interest on the note will be payable upon maturity.

Exchange of Outstanding Promissory Notes for Unsecured Convertible Notes

On March 11, 2019, the Company, entered into two securities exchange agreements (the "Exchange Agreements") with BayBridge (Note 12).

Pursuant to the terms of the Exchange Agreements, BayBridge agreed to surrender and exchange two outstanding promissory notes (Note 11) with principal balances of (i) \$123,817 (including accrued interest), and (ii) \$127,280 (including accrued interest), for two additional unsecured convertible notes with principal amounts of (i) \$160,000 and (ii) \$150,000. The notes are unsecured, bear interest at 12% per annum, mature on March 11, 2020, and contain standard and customary events of default including but not limited to: (i) failure to make payments when due under the note, and (ii) bankruptcy or insolvency of the Company. Principal and interest on the note will be payable upon maturity.

At any time after inception of the note until fully paid, BayBridge shall have the option to convert all or a portion of amounts outstanding under the note into shares of the Company's common stock. Conversions into common stock shall be calculated using a variable conversion price equal to the lesser of (i) a price equal to \$0.003, or (ii) 65% of the lowest closing bid price for the shares over the prior five trading days.

There are no registration rights applicable to the note. Shares of common stock may not be issued pursuant to the note if, after giving effect to the conversion or issuance, the holder together with its affiliates would beneficially own in excess of 9.99% of the outstanding shares of the Company's common stock.

Offering of Convertible Notes (Note 12)

Widjaja Convertible Note

On January 11, 2019, the Company entered into a note purchase with Jason Widjaja ("Widjaja"), for the private placement of a \$330,000 convertible promissory note, in exchange for \$330,000 of gross proceeds. The note is unsecured, bears interest at 12% per annum, matures on January 11, 2020, and contains standard and customary events of default including but not limited to: (i) failure to make payments when due under the note, and (ii) bankruptcy or insolvency of the Company. Principal and interest on the note will be payable upon maturity.

At any time after inception of the note until fully paid, Widjaja shall have the option to convert all or a portion of amounts outstanding under the note into shares of the Company's common stock. Conversions into common stock shall be calculated using a variable conversion price equal to 80% of the lowest closing bid price for the shares over the prior five trading days immediately preceding the conversion date.

There are no registration rights applicable to the note. Shares of common stock may not be issued pursuant to the note if, after giving effect to the conversion or issuance, the holder together with its affiliates would beneficially own in excess of 19.99% of the outstanding shares of the Company's common stock.

Power Up Convertible Notes

On February 14, 2019, the Company entered into an additional note purchase with Power Up, for the private placement of a \$54,500 convertible promissory note in exchange for \$54,500 of gross proceeds. The note is unsecured, bears interest at 8% per annum, matures on February 14, 2020, and contains standard and customary events of default including but not limited to: (i) failure to make payments when due under the note, and (ii) bankruptcy or insolvency of the Company. Principal and interest on the note will be payable upon maturity. The interest rate increases to 22% in the event of a default under the note.

Beginning in August 2019, Power Up shall have the option to convert all or a portion of the amounts outstanding under the note into shares of the Company's common stock. Conversions into common stock shall be calculated using a variable conversion price equal to 65% of the average of the three lowest closing bid prices for the shares over the prior ten day trading period immediately preceding the conversion.

There are no registration rights applicable to the note. Shares of common stock may not be issued pursuant to the note if, after giving effect to the conversion or issuance, the holder together with its affiliates would beneficially own in excess of 4.99% of the outstanding shares of the Company's common stock.

On March 7, 2019, the Company entered into an additional note purchase with Power Up, for the private placement of a \$54,500 convertible promissory note in exchange for \$54,500 of gross proceeds. The note is unsecured, bears interest at 8% per annum, matures on March 7, 2020, and contains standard and customary events of default including but not limited to: (i) failure to make payments when due under the note, and (ii) bankruptcy or insolvency of the Company. Principal and interest on the note will be payable upon maturity. The interest rate increases to 22% in the event of a default under the note.

Beginning in September 2019, Power Up shall have the option to convert all or a portion of the amounts outstanding under the note into shares of the Company's common stock. Conversions into common stock shall be calculated using a variable conversion price equal to 65% of the average of the three lowest closing bid prices for the shares over the prior ten day trading period immediately preceding the conversion.

There are no registration rights applicable to the note. Shares of common stock may not be issued pursuant to the note if, after giving effect to the conversion or issuance, the holder together with its affiliates would beneficially own in excess of 4.99% of the outstanding shares of the Company's common stock.

GS & EMA Convertible Notes

On February 22, 2019, the Company sold and issued to GS Capital Partners, LLC ("GS") a \$108,068 aggregate principal amount unsecured convertible promissory note in exchange for \$75,000 of gross proceeds and approximately \$27,000 of premium associated with the assignment of the EMA note (see below). The note is unsecured, bears interest at 8% per annum, matures on February 22, 2020, and contains standard and customary events of default including but not limited to: (i) failure to make payments when due under the note, and (ii) bankruptcy or insolvency of the Company. Principal and interest on the note will be payable upon maturity.

At any time after inception of the note until fully paid, GS shall have the option to convert all or a portion of amounts outstanding under the note into shares of the Company's common stock. Conversions into common stock shall be calculated using a variable conversion price equal to 65% of the average of the three lowest closing bid price for the shares over the prior ten day trading period immediately preceding the conversion.

There are no registration rights applicable to the note. Shares of common stock may not be issued pursuant to the note if, after giving effect to the conversion or issuance, the holder together with its affiliates would beneficially own in excess of 4.99% of the outstanding shares of the Company's common stock.

On February 22, 2019, GS purchased \$75,000 in convertible notes, plus accrued interest, from EMA. The terms of the note remain the same. There was a prepayment penalty associated with this assignment of approximately \$27,000, which was included in a new note issued to GS (see above).

Conversions of Convertible Notes (Note 12)

Subsequent to the date of this report, an additional \$106,750 in principal for St. George was converted into 58,503,244 shares of common stock.

Subsequent to the date of this report, an additional \$222,500 in principal, plus accrued interest, for BayBridge was converted into 61,611,485 shares of common stock.

Subsequent to the date of this report, an additional \$65,615 in principal, plus accrued interest, for Bellridge was converted into 47,400,806 shares of common stock.

Subsequent to the date of this report, an additional \$182,500 in principal, plus accrued interest, for Power Up was converted into 38,696,339 shares of common stock.

Conversion of Series A Preferred Stock (Note 13)

On January 11, 2019, the holder of Series A Preferred Stock converted 12,656 shares of Series A Preferred Stock, plus \$70,527 in accrued dividends, for 9,795,398 shares of common stock.

Sale of Building

On April 12, 2019, the Company entered into an agreement for the sale of its Thornton, Colorado building at a gross sales price of \$13 million. The closing of the transaction, which is subject to customary closing conditions, is expected to close in the third quarter of 2019.

SECURITIES PURCHASE AGREEMENT

This **SECURITIES PURCHASE AGREEMENT** (the “Agreement”), dated as of February 14, 2019, by and between **Ascent Solar Technologies, Inc.**, a Delaware corporation, with its address at 12300 Grant Street, Thornton, CO 80241 (the “Company”), and **POWER UP LENDING GROUP LTD.**, a Virginia corporation, with its address at 111 Great Neck Road, Suite 216, Great Neck, NY 11021 (the “Buyer”).

WHEREAS :

A. The Company and the Buyer are executing and delivering this Agreement in reliance upon the exemption from securities registration afforded by the rules and regulations as promulgated by the United States Securities and Exchange Commission (the “SEC”) under the Securities Act of 1933, as amended (the “1933 Act”); and

B. Buyer desires to purchase and the Company desires to issue and sell, upon the terms and conditions set forth in this Agreement a convertible note of the Company, in the form attached hereto as Exhibit A, in the aggregate principal amount of \$54,500.00 (together with any note(s) issued in replacement thereof or as a dividend thereon or otherwise with respect thereto in accordance with the terms thereof, the “Note”), convertible into shares of common stock, \$0.0001 par value per share, of the Company (the “Common Stock”), upon the terms and subject to the limitations and conditions set forth in such Note.

NOW THEREFORE, the Company and the Buyer severally (and not jointly) hereby agree as follows:

1. Purchase and Sale of Note.

a. Purchase of Note. On the Closing Date (as defined below), the Company shall issue and sell to the Buyer and the Buyer agrees to purchase from the Company such principal amount of Note as is set forth immediately below the Buyer’s name on the signature pages hereto.

b. Form of Payment. On the Closing Date (as defined below), (1) the Buyer shall pay the purchase price for the Note to be issued and sold to it at the Closing (as defined below) (the “Purchase Price”) by wire transfer of immediately available funds to the Company, in accordance with the Company’s written wiring instructions, against delivery of the Note in the principal amount equal to the Purchase Price as is set forth immediately below the Buyer’s name on the signature pages hereto, and (1) the Company shall deliver such duly executed Note on behalf of the Company, to the Buyer, against delivery of such Purchase Price.

c. Closing Date. Subject to the satisfaction (or written waiver) of the conditions thereto set forth in Section 6 and Section 7 below, the date and time of the issuance and sale of the Note pursuant to this Agreement (the “Closing Date”) shall be 12:00 noon, Eastern Standard Time on or about February 15, 2019, or such other mutually agreed upon time. The closing of the transactions contemplated by this Agreement (the “Closing”) shall occur on the Closing Date at such location as may be agreed to by the parties.

2. Buyer's Representations and Warranties. The Buyer represents and warrants to the Company that:

a. Investment Purpose. As of the date hereof, the Buyer is purchasing the Note and the shares of Common Stock issuable upon conversion of or otherwise pursuant to the Note (such shares of Common Stock being collectively referred to herein as the "Conversion Shares" and, collectively with the Note, the "Securities") for its own account and not with a present view towards the public sale or distribution thereof, except pursuant to sales registered or exempted from registration under the 1933 Act.

b. Accredited Investor Status. The Buyer is an "accredited investor" as that term is defined in Rule 501(a) of Regulation D (an "Accredited Investor").

c. Reliance on Exemptions. The Buyer understands that the Securities are being offered and sold to it in reliance upon specific exemptions from the registration requirements of United States federal and state securities laws and that the Company is relying upon the truth and accuracy of, and the Buyer's compliance with, the representations, warranties, agreements, acknowledgments and understandings of the Buyer set forth herein in order to determine the availability of such exemptions and the eligibility of the Buyer to acquire the Securities.

d. Information. The Company has not disclosed to the Buyer any material nonpublic information and will not disclose such information unless such information is disclosed to the public prior to or promptly following such disclosure to the Buyer.

e. Legends. The Buyer understands that the Note and, until such time as the Conversion Shares have been registered under the 1933 Act; or may be sold pursuant to an applicable exemption from registration, the Conversion Shares may bear a restrictive legend in substantially the following form:

"THE SECURITIES REPRESENTED BY THIS INSTRUMENT HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "SECURITIES ACT"), OR UNDER ANY STATE SECURITIES LAWS, AND MAY NOT BE PLEDGED, SOLD, ASSIGNED, HYPOTHECATED OR OTHERWISE TRANSFERRED UNLESS (1) A REGISTRATION STATEMENT WITH RESPECT THERETO IS EFFECTIVE UNDER THE SECURITIES ACT AND ANY APPLICABLE STATE SECURITIES LAWS OR (2) THE ISSUER OF SUCH SECURITIES RECEIVES AN OPINION OF COUNSEL TO THE HOLDER OF SUCH SECURITIES, WHICH COUNSEL AND OPINION ARE REASONABLY ACCEPTABLE TO THE ISSUER'S TRANSFER AGENT, THAT SUCH SECURITIES MAY BE PLEDGED, SOLD, ASSIGNED, HYPOTHECATED OR OTHERWISE TRANSFERRED WITHOUT AN EFFECTIVE REGISTRATION STATEMENT UNDER THE SECURITIES ACT AND APPLICABLE STATE SECURITIES LAWS."

The legend set forth above shall be removed and the Company shall issue a certificate without such legend to the holder of any Security upon which it is stamped, if, unless otherwise required by applicable state securities laws, (a) such Security is registered for sale under an effective registration statement filed under the 1933 Act or otherwise may be sold pursuant to an exemption from registration without any restriction as to the number of securities as of a particular date that can then be immediately sold, or (b) such holder provides the Company with an opinion of counsel, in form, substance and scope customary for opinions of counsel in comparable transactions, to the effect that a public sale or transfer of such Security may be made without registration under the 1933 Act, which opinion shall be accepted by the Company so that the sale or transfer is effected. The Buyer agrees to sell all Securities, including those represented by a certificate(s) from which the legend has been removed, in compliance with applicable prospectus delivery requirements, if any. In the event that the Company does not accept the opinion of counsel provided by the Buyer with respect to the transfer of Securities pursuant to an exemption from registration, such as Rule 144, at the Deadline, it will be considered an Event of Default pursuant to Section 3.2 of the Note.

f. Authorization; Enforcement. This Agreement has been duly and validly authorized. This Agreement has been duly executed and delivered on behalf of the Buyer, and this Agreement constitutes a valid and binding agreement of the Buyer enforceable in accordance with its terms.

3. Representations and Warranties of the Company. The Company represents and warrants to the Buyer that:

a. Organization and Qualification. The Company and each of its Subsidiaries (as defined below), if any, is a corporation duly organized, validly existing and in good standing under the laws of the jurisdiction in which it is incorporated, with full power and authority (corporate and other) to own, lease, use and operate its properties and to carry on its business as and where now owned, leased, used, operated and conducted. "Subsidiaries" means any corporation or other organization, whether incorporated or unincorporated, in which the Company owns, directly or indirectly, any equity or other ownership interest.

b. Authorization; Enforcement. (i) The Company has all requisite corporate power and authority to enter into and perform this Agreement, the Note and to consummate the transactions contemplated hereby and thereby and to issue the Securities, in accordance with the terms hereof and thereof, (ii) the execution and delivery of this Agreement, the Note by the Company and the consummation by it of the transactions contemplated hereby and thereby (including without limitation, the issuance of the Note and the issuance and reservation for issuance of the Conversion Shares issuable upon conversion or exercise thereof) have been duly authorized by the Company's Board of Directors and no further consent or authorization of the Company, its Board of Directors, or its shareholders is required, (iii) this Agreement has been duly executed and delivered by the Company by its authorized representative, and such authorized representative is the true and official representative with authority to sign this Agreement and the other documents executed in connection herewith and bind the Company accordingly, and (iv) this Agreement constitutes, and upon execution and delivery by the Company of the Note, each of such instruments will constitute, a legal, valid and binding obligation of the Company enforceable against the Company in accordance with its terms.

c. Capitalization. As of the date hereof, the authorized common stock of the Company consists of 20,000,000,000 authorized shares of Common Stock, \$0.0001 par value per share, of which 42,523,847 shares are issued and outstanding; and 64,086,232 shares are reserved for issuance upon conversion of the Note. All of such outstanding shares of capital stock are, or upon issuance will be, duly authorized, validly issued, fully paid and non-assessable.

d. Issuance of Shares. The Conversion Shares are duly authorized and reserved for issuance and, upon conversion of the Note in accordance with its respective terms, will be validly issued, fully paid and non-assessable, and free from all taxes, liens, claims and encumbrances with respect to the issue thereof and shall not be subject to preemptive rights or other similar rights of shareholders of the Company and will not impose personal liability upon the holder thereof.

e. No Conflicts. The execution, delivery and performance of this Agreement, the Note by the Company and the consummation by the Company of the transactions contemplated hereby and thereby (including, without limitation, the issuance and reservation for issuance of the Conversion Shares) will not (i) conflict with or result in a violation of any provision of the Certificate of Incorporation or By-laws, or (ii) violate or conflict with, or result in a breach of any provision of, or constitute a default (or an event which with notice or lapse of time or both could become a default) under, or give to others any rights of termination, amendment, acceleration or cancellation of, any agreement, indenture, patent, patent license or instrument to which the Company or any of its Subsidiaries is a party, or (iii) result in a violation of any law, rule, regulation, order, judgment or decree (including federal and state securities laws and regulations and regulations of any self-regulatory organizations to which the Company or its securities are subject) applicable to the Company or any of its Subsidiaries or by which any property or asset of the Company or any of its Subsidiaries is bound or affected (except for such conflicts, defaults, terminations, amendments, accelerations, cancellations and violations as would not, individually or in the aggregate, have a Material Adverse Effect). The businesses of the Company and its Subsidiaries, if any, are not being conducted, and shall not be conducted so long as the Buyer owns any of the Securities, in violation of any law, ordinance or regulation of any governmental entity. "Material Adverse Effect" means any material adverse effect on the business, operations, assets, financial condition or prospects of the Company or its Subsidiaries, if any, taken as a whole, or on the transactions contemplated hereby or by the agreements or instruments to be entered into in connection herewith.

f. SEC Documents; Financial Statements. The Company has filed all reports, schedules, forms, statements and other documents required to be filed by it with the SEC pursuant to the reporting requirements of the Securities Exchange Act of 1934, as amended (the "1934 Act") (all of the foregoing filed prior to the date hereof and all exhibits included therein and financial statements and schedules thereto and documents (other than exhibits to such documents) incorporated by reference therein, being hereinafter referred to herein as the "SEC Documents"). Upon written request the Company will deliver to the Buyer true and complete copies of the SEC Documents, except for such exhibits and incorporated documents. As of their respective dates or if amended, as of the dates of the amendments, the SEC Documents complied in all material respects with the requirements of the 1934 Act and the rules and regulations of the SEC promulgated thereunder applicable to the SEC Documents, and none of the SEC Documents, at the time they were filed with the SEC, contained any untrue statement of a material fact or omitted to state a material fact required to be stated therein or necessary in order to make the statements therein, in light of the circumstances under which they were made, not misleading. None of the statements made in any such SEC Documents is, or has been, required to be amended or updated under applicable law (except for such statements as have been amended or updated in subsequent filings prior the date hereof). As of their respective dates or if amended, as of the dates of the amendments, the financial statements of the Company included in the SEC Documents complied as to form in all material respects with applicable accounting requirements and the published rules and regulations of the SEC with respect thereto. Such financial statements have been prepared in accordance with United States generally accepted accounting principles, consistently applied, during the periods involved and fairly present in all material respects the consolidated financial position of the Company and its consolidated Subsidiaries as of the dates thereof and the consolidated results of their operations and cash flows for the periods then ended (subject, in the case of unaudited statements, to normal year-end audit adjustments). The Company is subject to the reporting requirements of the 1934 Act.

g. Absence of Certain Changes. Since September 30, 2018, except as set forth in the SEC Documents, there has been no material adverse change and no material adverse development in the assets, liabilities, business, properties, operations, financial condition, results of operations, prospects or 1934 Act reporting status of the Company or any of its Subsidiaries.

h. Absence of Litigation. Except as set forth in the SEC Documents, there is no action, suit, claim, proceeding, inquiry or investigation before or by any court, public board, government agency, self-regulatory organization or body pending or, to the knowledge of the Company or any of its Subsidiaries, threatened against or affecting the Company or any of its Subsidiaries, or their officers or directors in their capacity as such, that could have a Material Adverse Effect. The Company and its Subsidiaries are unaware of any facts or circumstances which might give rise to any of the foregoing.

i. No Integrated Offering. Neither the Company, nor any of its affiliates, nor any person acting on its or their behalf, has directly or indirectly made any offers or sales in any security or solicited any offers to buy any security under circumstances that would require registration under the 1933 Act of the issuance of the Securities to the Buyer. The issuance of the Securities to the Buyer will not be integrated with any other issuance of the Company's securities (past, current or future) for purposes of any shareholder approval provisions applicable to the Company or its securities.

j. No Brokers. The Company has taken no action which would give rise to any claim by any person for brokerage commissions, transaction fees or similar payments relating to this Agreement or the transactions contemplated hereby.

k. No Investment Company. The Company is not, and upon the issuance and sale of the Securities as contemplated by this Agreement will not be an "investment company" required to be registered under the Investment Company Act of 1940 (an "Investment Company"). The Company is not controlled by an Investment Company.

l. Breach of Representations and Warranties by the Company. If the Company breaches any of the representations or warranties set forth in this Section 3, and in addition to any other remedies available to the Buyer pursuant to this Agreement, it will be considered an Event of default under Section 3.4 of the Note.

4. COVENANTS.

a. Best Efforts. The Company shall use its best efforts to satisfy timely each of the conditions described in Section 7 of this Agreement.

b. Form D; Blue Sky Laws. The Company agrees to timely make any filings required by federal and state laws as a result of the closing of the transactions contemplated by this Agreement.

c. Use of Proceeds. The Company shall use the proceeds for general working capital purposes.

d. Expenses. At the Closing, the Company's obligation with respect to the transactions contemplated by this Agreement is to reimburse Buyer's expenses shall be \$2,500.00 for Buyer's legal fees and due diligence fee.

e. Corporate Existence. So long as the Buyer beneficially owns any Note, the Company shall maintain its corporate existence and shall not sell all or substantially all of the Company's assets, except with the prior written consent of the Buyer.

f. Breach of Covenants. If the Company breaches any of the covenants set forth in this Section 4, and in addition to any other remedies available to the Buyer pursuant to this Agreement, it will be considered an event of default under Section 3.4 of the Note.

g. Failure to Comply with the 1934 Act. So long as the Buyer beneficially owns the Note, the Company shall comply with the reporting requirements of the 1934 Act; and the Company shall continue to be subject to the reporting requirements of the 1934 Act.

h. Trading Activities. Neither the Buyer nor its affiliates has an open short position in the common stock of the Company and the Buyer agrees that it shall not, and that it will cause its affiliates not to, engage in any short sales of or hedging transactions with respect to the common stock of the Company.

i. Right of First Refusal. Unless it shall have first delivered to the Buyer, at least forty eight (48) hours prior to the closing of such Future Offering (as defined herein), written notice describing the proposed Future Offering ("ROFR Notice"), including the terms and conditions thereof, identity of the proposed purchaser and proposed definitive documentation to be entered into in connection therewith, and providing the Buyer an option during the forty eight (48) hour period following delivery of such notice to purchase the securities being offered in the Future Offering on the same terms as contemplated by such Future Offering (the limitations referred to in this sentence and the preceding sentence are collectively referred to as the "Right of First Refusal"), the Company will not conduct any equity (or debt with an equity component) financing in an amount less than \$150,000 ("Future Offering(s)") during the period beginning on the Closing Date and ending nine (9) months following the Closing Date. In the event the terms and conditions of a proposed Future Offering are amended in any respect after delivery of the notice to the Buyer concerning the proposed Future Offering, the Company shall deliver a new notice to the Buyer describing the amended terms and conditions of the proposed Future Offering and the Buyer thereafter shall have an option during the forty eight (48) hour period following delivery of such new notice to purchase its pro rata share of the securities being offered on the same terms as contemplated by such proposed Future Offering, as amended. Notwithstanding anything contained herein to the contrary, any subsequent offer by an investor, or an affiliate of such investor, identified on an ROFR Notice is subject to this Section 4(h) and the Right of First Refusal.

5. Transfer Agent Instructions. The Company shall issue irrevocable instructions to its transfer agent to issue certificates, registered in the name of the Buyer or its nominee, for the Conversion Shares in such amounts as specified from time to time by the Buyer to the Company upon conversion of the Note in accordance with the terms thereof (the “Irrevocable Transfer Agent Instructions”). In the event that the Company proposes to replace its transfer agent, the Company shall provide, prior to the effective date of such replacement, a fully executed Irrevocable Transfer Agent Instructions in a form as initially delivered pursuant to this Agreement (including but not limited to the provision to irrevocably reserve shares of Common Stock in the Reserved Amount as such term is defined in the Note) signed by the successor transfer agent to Company and the Company. Prior to registration of the Conversion Shares under the 1933 Act or the date on which the Conversion Shares may be sold pursuant to an exemption from registration, all such certificates shall bear the restrictive legend specified in Section 2(e) of this Agreement. The Company warrants that: (i) no instruction other than the Irrevocable Transfer Agent Instructions referred to in this Section 5, will be given by the Company to its transfer agent and that the Securities shall otherwise be freely transferable on the books and records of the Company as and to the extent provided in this Agreement and the Note; (ii) it will not direct its transfer agent not to transfer or delay, impair, and/or hinder its transfer agent in transferring (or issuing)(electronically or in certificated form) any certificate for Conversion Shares to be issued to the Buyer upon conversion of or otherwise pursuant to the Note as and when required by the Note and this Agreement; and (iii) it will not fail to remove (or directs its transfer agent not to remove or impairs, delays, and/or hinders its transfer agent from removing) any restrictive legend (or to withdraw any stop transfer instructions in respect thereof) on any certificate for any Conversion Shares issued to the Buyer upon conversion of or otherwise pursuant to the Note as and when required by the Note and/or this Agreement. If the Buyer provides the Company and the Company’s transfer, at the cost of the Buyer, with an opinion of counsel in form, substance and scope customary for opinions in comparable transactions, to the effect that a public sale or transfer of such Securities may be made without registration under the 1933 Act, the Company shall permit the transfer, and, in the case of the Conversion Shares, promptly instruct its transfer agent to issue one or more certificates, free from restrictive legend, in such name and in such denominations as specified by the Buyer. The Company acknowledges that a breach by it of its obligations hereunder will cause irreparable harm to the Buyer, by vitiating the intent and purpose of the transactions contemplated hereby. Accordingly, the Company acknowledges that the remedy at law for a breach of its obligations under this Section 5 may be inadequate and agrees, in the event of a breach or threatened breach by the Company of the provisions of this Section, that the Buyer shall be entitled, in addition to all other available remedies, to an injunction restraining any breach and requiring immediate transfer, without the necessity of showing economic loss and without any bond or other security being required.

6. Conditions to the Company’s Obligation to Sell. The obligation of the Company hereunder to issue and sell the Note to the Buyer at the Closing is subject to the satisfaction, at or before the Closing Date of each of the following conditions thereto, provided that these conditions are for the Company’s sole benefit and may be waived by the Company at any time in its sole discretion:

- a. The Buyer shall have executed this Agreement and delivered the same to the Company.
- b. The Buyer shall have delivered the Purchase Price in accordance with Section 1(b) above.

c. The representations and warranties of the Buyer shall be true and correct in all material respects as of the date when made and as of the Closing Date as though made at that time (except for representations and warranties that speak as of a specific date), and the Buyer shall have performed, satisfied and complied in all material respects with the covenants, agreements and conditions required by this Agreement to be performed, satisfied or complied with by the Buyer at or prior to the Closing Date.

d. No litigation, statute, rule, regulation, executive order, decree, ruling or injunction shall have been enacted, entered, promulgated or endorsed by or in any court or governmental authority of competent jurisdiction or any self-regulatory organization having authority over the matters contemplated hereby which prohibits the consummation of any of the transactions contemplated by this Agreement.

7. Conditions to The Buyer's Obligation to Purchase. The obligation of the Buyer hereunder to purchase the Note at the Closing is subject to the satisfaction, at or before the Closing Date of each of the following conditions, provided that these conditions are for the Buyer's sole benefit and may be waived by the Buyer at any time in its sole discretion:

a. The Company shall have executed this Agreement and delivered the same to the Buyer.

b. The Company shall have delivered to the Buyer the duly executed Note (in such denominations as the Buyer shall request) in accordance with Section 1(b) above.

c. The Irrevocable Transfer Agent Instructions, in form and substance satisfactory to the Buyer, shall have been delivered to and acknowledged in writing by the Company's Transfer Agent.

d. The representations and warranties of the Company shall be true and correct in all material respects as of the date when made and as of the Closing Date as though made at such time (except for representations and warranties that speak as of a specific date) and the Company shall have performed, satisfied and complied in all material respects with the covenants, agreements and conditions required by this Agreement to be performed, satisfied or complied with by the Company at or prior to the Closing Date. The Buyer shall have received a certificate or certificates, executed by the chief executive officer of the Company, dated as of the Closing Date, to the foregoing effect and as to such other matters as may be reasonably requested by the Buyer including, but not limited to certificates with respect to the Board of Directors' resolutions relating to the transactions contemplated hereby.

e. No litigation, statute, rule, regulation, executive order, decree, ruling or injunction shall have been enacted, entered, promulgated or endorsed by or in any court or governmental authority of competent jurisdiction or any self-regulatory organization having authority over the matters contemplated hereby which prohibits the consummation of any of the transactions contemplated by this Agreement.

f. No event shall have occurred which could reasonably be expected to have a Material Adverse Effect on the Company including but not limited to a change in the 1934 Act reporting status of the Company or the failure of the Company to be timely in its 1934 Act reporting obligations.

g. The Conversion Shares shall have been authorized for quotation on an exchange or electronic quotation system and trading in the Common Stock on such exchange or electronic quotation system shall not have been suspended by the SEC or an exchange or electronic quotation system.

8. Governing Law; Miscellaneous.

a. Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of Virginia without regard to principles of conflicts of laws. Any action brought by either party against the other concerning the transactions contemplated by this Agreement shall be brought only in the state courts of New York or in the federal courts located in the Eastern District of New York. The parties to this Agreement hereby irrevocably waive any objection to jurisdiction and venue of any action instituted hereunder and shall not assert any defense based on lack of jurisdiction or venue or based upon *forum non conveniens*. The Company and Buyer waive trial by jury. The prevailing party shall be entitled to recover from the other party its reasonable attorney's fees and costs. In the event that any provision of this Agreement or any other agreement delivered in connection herewith is invalid or unenforceable under any applicable statute or rule of law, then such provision shall be deemed inoperative to the extent that it may conflict therewith and shall be deemed modified to conform with such statute or rule of law. Any such provision which may prove invalid or unenforceable under any law shall not affect the validity or enforceability of any other provision of any agreement. Each party hereby irrevocably waives personal service of process and consents to process being served in any suit, action or proceeding in connection with this Agreement, the Note or any related document or agreement by mailing a copy thereof via registered or certified mail or overnight delivery (with evidence of delivery) to such party at the address in effect for notices to it under this Agreement and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any other manner permitted by law.

b. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original but all of which shall constitute one and the same agreement and shall become effective when counterparts have been signed by each party and delivered to the other party.

c. Headings. The headings of this Agreement are for convenience of reference only and shall not form part of, or affect the interpretation of, this Agreement.

d. Severability. In the event that any provision of this Agreement is invalid or unenforceable under any applicable statute or rule of law, then such provision shall be deemed inoperative to the extent that it may conflict therewith and shall be deemed modified to conform with such statute or rule of law. Any provision hereof which may prove invalid or unenforceable under any law shall not affect the validity or enforceability of any other provision hereof.

e. Entire Agreement; Amendments. This Agreement and the instruments referenced herein contain the entire understanding of the parties with respect to the matters covered herein and therein and, except as specifically set forth herein or therein, neither the Company nor the Buyer makes any representation, warranty, covenant or undertaking with respect to such matters. No provision of this Agreement may be waived or amended other than by an instrument in writing signed by the majority in interest of the Buyer.

f. Notices. All notices, demands, requests, consents, approvals, and other communications required or permitted hereunder shall be in writing and, unless otherwise specified herein, shall be (i) personally served, (ii) deposited in the mail, registered or certified, return receipt requested, postage prepaid, (iii) delivered by reputable air courier service with charges prepaid, or (iv) transmitted by hand delivery, telegram, or facsimile, addressed as set forth below or to such other address as such party shall have specified most recently by written notice. Any notice or other communication required or permitted to be given hereunder shall be deemed effective (a) upon hand delivery or delivery by facsimile, with accurate confirmation generated by the transmitting facsimile machine, at the address or number designated below (if delivered on a business day during normal business hours where such notice is to be received), or the first business day following such delivery (if delivered other than on a business day during normal business hours where such notice is to be received) or (b) on the second business day following the date of mailing by express courier service, fully prepaid, addressed to such address, or upon actual receipt of such mailing, whichever shall first occur. The addresses for such communications shall be as set forth in the heading of this Agreement with a copy by fax only to (which copy shall not constitute notice) to Naidich Wurman LLP, 111 Great Neck Road, Suite 214, Great Neck, NY 11021, Attn: Allison Naidich, facsimile: 516-466-3555, e-mail: allison@nwlaw.com. Each party shall provide notice to the other party of any change in address.

g. Successors and Assigns. This Agreement shall be binding upon and inure to the benefit of the parties and their successors and assigns. Neither the Company nor the Buyer shall assign this Agreement or any rights or obligations hereunder without the prior written consent of the other. Notwithstanding the foregoing, the Buyer may assign its rights hereunder to any person that purchases Securities in a private transaction from the Buyer or to any of its “affiliates,” as that term is defined under the 1934 Act, without the consent of the Company.

h. Survival. The representations and warranties of the Company and the agreements and covenants set forth in this Agreement shall survive the closing hereunder notwithstanding any due diligence investigation conducted by or on behalf of the Buyer. The Company agrees to indemnify and hold harmless the Buyer and all their officers, directors, employees and agents for loss or damage arising as a result of or related to any breach or alleged breach by the Company of any of its representations, warranties and covenants set forth in this Agreement or any of its covenants and obligations under this Agreement, including advancement of expenses as they are incurred.

i. Further Assurances. Each party shall do and perform, or cause to be done and performed, all such further acts and things, and shall execute and deliver all such other agreements, certificates, instruments and documents, as the other party may reasonably request in order to carry out the intent and accomplish the purposes of this Agreement and the consummation of the transactions contemplated hereby.

j. No Strict Construction. The language used in this Agreement will be deemed to be the language chosen by the parties to express their mutual intent, and no rules of strict construction will be applied against any party.

k. Remedies. The Company acknowledges that a breach by it of its obligations hereunder will cause irreparable harm to the Buyer by vitiating the intent and purpose of the transaction contemplated hereby. Accordingly, the Company acknowledges that the remedy at law for a breach of its obligations under this Agreement will be inadequate and agrees, in the event of a breach or threatened breach by the Company of the provisions of this Agreement, that the Buyer shall be entitled, in addition to all other available remedies at law or in equity, and in addition to the penalties assessable herein, to an injunction or injunctions restraining, preventing or curing any breach of this Agreement and to enforce specifically the terms and provisions hereof, without the necessity of showing economic loss and without any bond or other security being required.

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IN WITNESS WHEREOF, the undersigned Buyer and the Company have caused this Agreement to be duly executed as of the date first above written.

Ascent Solar Technologies, Inc.

By : /s/Victor Lee
Victor Lee
Chief Executive Officer

POWER UP LENDING GROUP LTD.

By : /s/Curt Kramer
Name: Curt Kramer
Title: Chief Executive Officer
111 Great Neck Road, Suite 216
Great Neck, NY 11021

AGGREGATE SUBSCRIPTION AMOUNT:

Aggregate Principal Amount of Note: \$54,500.00

Aggregate Purchase Price: \$54,500.00

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

Principal Amount: \$54,500.00 Issue Date: February 14, 2019
Purchase Price: \$54,500.00

CONVERTIBLE PROMISSORY NOTE

FOR VALUE RECEIVED, Ascent Solar Technologies, Inc., a Delaware corporation (hereinafter called the “Borrower”), hereby promises to pay to the order of **POWER UP LENDING GROUP LTD.**, a Virginia corporation, or registered assigns (the “Holder”) the sum of \$54,500.00 together with any interest as set forth herein, on February 14, 2020 (the “Maturity Date”), and to pay interest on the unpaid principal balance hereof at the rate of eight percent (8%)(the “Interest Rate”) per annum from the date hereof (the “Issue Date”) until the same becomes due and payable, whether at maturity or upon acceleration or by prepayment or otherwise. This Note may not be prepaid in whole or in part except as otherwise explicitly set forth herein. Any amount of principal or interest on this Note which is not paid when due shall bear interest at the rate of twenty two percent (22%) per annum from the due date thereof until the same is paid (“Default Interest”). Interest shall be computed on the basis of a 365 day year and the actual number of days elapsed. Interest shall commence accruing on the Issue Date but shall not be payable until the Note becomes payable (whether at Maturity Date or upon acceleration or by prepayment). All payments due hereunder (to the extent not converted into common stock, \$0.0001 par value per share (the “Common Stock”) in accordance with the terms hereof) shall be made in lawful money of the United States of America. All payments shall be made at such address as the Holder shall hereafter give to the Borrower by written notice made in accordance with the provisions of this Note. Each capitalized term used herein, and not otherwise defined, shall have the meaning ascribed thereto in that certain Securities Purchase Agreement dated the date hereof, pursuant to which this Note was originally issued (the “Purchase Agreement”).

This Note is free from all taxes, liens, claims and encumbrances with respect to the issue thereof and shall not be subject to preemptive rights or other similar rights of shareholders of the Borrower and will not impose personal liability upon the holder thereof.

The following terms shall apply to this Note:

Article I.

CONVERSION RIGHTS

1.1 Conversion Right. The Holder shall have the right from time to time, and at any time during the period beginning on the date which is one hundred eighty (180) days following the date of this Note and ending on the later of: (i) the Maturity Date and (ii) the date of payment of the Default Amount (as defined in Article III), each in respect of the remaining outstanding principal amount of this Note to convert all or any part of the outstanding and unpaid principal amount of this Note into fully paid and non-assessable shares of Common Stock, as such Common Stock exists on the Issue Date, or any shares of capital stock or other securities of the Borrower into which such Common Stock shall hereafter be changed or reclassified at the conversion price (the "Conversion Price") determined as provided herein (a "Conversion"); provided, however, that in no event shall the Holder be entitled to convert any portion of this Note in excess of that portion of this Note upon conversion of which the sum of (1) the number of shares of Common Stock beneficially owned by the Holder and its affiliates (other than shares of Common Stock which may be deemed beneficially owned through the ownership of the unconverted portion of the Notes or the unexercised or unconverted portion of any other security of the Borrower subject to a limitation on conversion or exercise analogous to the limitations contained herein) and (2) the number of shares of Common Stock issuable upon the conversion of the portion of this Note with respect to which the determination of this proviso is being made, would result in beneficial ownership by the Holder and its affiliates of more than 4.99% of the outstanding shares of Common Stock. For purposes of the proviso to the immediately preceding sentence, beneficial ownership shall be determined in accordance with Section 13(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and Regulations 13D-G thereunder, except as otherwise provided in clause (1) of such proviso. The beneficial ownership limitations on conversion as set forth in the section may NOT be waived by the Holder. The number of shares of Common Stock to be issued upon each conversion of this Note shall be determined by dividing the Conversion Amount (as defined below) by the applicable Conversion Price then in effect on the date specified in the notice of conversion, in the form attached hereto as Exhibit A (the "Notice of Conversion"), delivered to the Borrower by the Holder in accordance with Section 1.4 below; provided that the Notice of Conversion is submitted by facsimile or e-mail (or by other means resulting in, or reasonably expected to result in, notice) to the Borrower before 6:00 p.m., New York, New York time on such conversion date (the "Conversion Date"); however, if the Notice of Conversion is sent after 6:00pm, New York, New York time the Conversion Date shall be the next business day. The term "Conversion Amount" means, with respect to any conversion of this Note, the sum of (1) the principal amount of this Note to be converted in such conversion plus (2) at the Holder's option, accrued and unpaid interest, if any, on such principal amount at the interest rates provided in this Note to the Conversion Date, plus (3) at the Holder's option, Default Interest, if any, on the amounts referred to in the immediately preceding clauses (1) and/or (2) plus (4) at the Holder's option, any amounts owed to the Holder pursuant to Sections 1.4 hereof.

1.2 Conversion Price. The conversion price (the "Conversion Price") shall equal the Variable Conversion Price (as defined herein) (subject to equitable adjustments by the Borrower relating to the Borrower's securities or the securities of any subsidiary of the Borrower, combinations, recapitalization, reclassifications, extraordinary distributions and similar events). The "Variable Conversion Price" shall mean 65% multiplied by the Market Price (as defined herein) (representing a discount rate of 35%). "Market Price" means the average of the lowest three (3) Trading Prices (as defined below) for the Common Stock during the ten (10) Trading Day period ending on the latest complete Trading Day prior to the Conversion Date. "Trading Price" means, for any security as of any date, the closing bid price on the OTCQB, OTCQX, Pink Sheets electronic quotation system or applicable trading market (the "OTC") as reported by a reliable reporting service ("Reporting Service") designated by the Holder (i.e. Bloomberg) or, if the OTC is not the principal trading market for such security, the closing bid price of such security on the principal securities exchange or trading market where such security is listed or traded or, if no closing bid price of such security is available in any of the foregoing manners, the average of the closing bid prices of any market makers for such security that are listed in the "pink sheets". If the Trading Price cannot be calculated for such security on such date in the manner provided above, the Trading Price shall be the fair market value as reasonably determined by the Borrower. "Trading Day" shall mean any day on which the Common Stock is tradable for any period on the OTC, or on the principal securities exchange or other securities market on which the Common Stock is then being traded.

1.3 Authorized Shares. The Borrower covenants that during the period the conversion right exists, the Borrower will reserve from its authorized and unissued Common Stock a sufficient number of shares, free from preemptive rights, to provide for the issuance of Common Stock upon the full conversion of this Note issued pursuant to the Purchase Agreement. The Borrower is required at all times to have authorized and reserved four times the number of shares that would be issuable upon full conversion of the Note (assuming that the 4.99% limitation set forth in Section 1.1 is not in effect)(based on the respective Conversion Price of the Note (as defined in Section 1.2) in effect from time to time, initially 64,086,232 shares)(the "Reserved Amount"). The Reserved Amount shall be increased (or decreased with the written consent of the Holder) from time to time in accordance with the Borrower's obligations hereunder. The Borrower represents that upon issuance, such shares will be duly and validly issued, fully paid and non-assessable. In addition, if the Borrower shall issue any securities or make any change to its capital structure which would change the number of shares of Common Stock into which the Notes shall be convertible at the then current Conversion Price, the Borrower shall at the same time make proper provision so that thereafter there shall be a sufficient number of shares of Common Stock authorized and reserved, free from preemptive rights, for conversion of the outstanding Note. The Borrower (i) acknowledges that it has irrevocably instructed its transfer agent to issue certificates for the Common Stock issuable upon conversion of this Note, and (ii) agrees that its issuance of this Note shall constitute full authority to its officers and agents who are charged with the duty of executing stock certificates to execute and issue the necessary certificates for shares of Common Stock in accordance with the terms and conditions of this Note.

If, at any time the Borrower does not maintain the Reserved Amount it will be considered an Event of Default under Section 3.2 of the Note.

1.4 Method of Conversion

(a) Mechanics of Conversion. As set forth in Section 1.1 hereof, from time to time, and at any time during the period beginning on the date which is one hundred eighty (180) days following the date of this Note and ending on the later of: (i) the Maturity Date and (ii) the date of payment of the Default Amount, this Note may be converted by the Holder in whole or in part at any time from time to time after the Issue Date, by (A) submitting to the Borrower a Notice of Conversion (by facsimile, e-mail or other reasonable means of communication dispatched on the Conversion Date prior to 6:00 p.m., New York, New York time) and (B) subject to Section 1.4(b), surrendering this Note at the principal office of the Borrower (upon payment in full of any amounts owed hereunder).

(b) Surrender of Note Upon Conversion. Notwithstanding anything to the contrary set forth herein, upon conversion of this Note in accordance with the terms hereof, the Holder shall not be required to physically surrender this Note to the Borrower unless the entire unpaid principal amount of this Note is so converted. The Holder and the Borrower shall maintain records showing the principal amount so converted and the dates of such conversions or shall use such other method, reasonably satisfactory to the Holder and the Borrower, so as not to require physical surrender of this Note upon each such conversion.

(c) Delivery of Common Stock Upon Conversion. Upon receipt by the Borrower from the Holder of a facsimile transmission or e-mail (or other reasonable means of communication) of a Notice of Conversion meeting the requirements for conversion as provided in this Section 1.4, the Borrower shall issue and deliver or cause to be issued and delivered to or upon the order of the Holder certificates for the Common Stock issuable upon such conversion within two (2) business days after such receipt (the "Deadline") (and, solely in the case of conversion of the entire unpaid principal amount hereof, surrender of this Note) in accordance with the terms hereof and the Purchase Agreement. Upon receipt by the Borrower of a Notice of Conversion, the Holder shall be deemed to be the holder of record of the Common Stock issuable upon such conversion, the outstanding principal amount and the amount of accrued and unpaid interest on this Note shall be reduced to reflect such conversion, and, unless the Borrower defaults on its obligations hereunder, all rights with respect to the portion of this Note being so converted shall forthwith terminate except the right to receive the Common Stock or other securities, cash or other assets, as herein provided, on such conversion. If the Holder shall have given a Notice of Conversion as provided herein, the Borrower's obligation to issue and deliver the certificates for Common Stock shall be absolute and unconditional, irrespective of the absence of any action by the Holder to enforce the same, any waiver or consent with respect to any provision thereof, the recovery of any judgment against any person or any action to enforce the same, any failure or delay in the enforcement of any other obligation of the Borrower to the holder of record, or any setoff, counterclaim, recoupment, limitation or termination, or any breach or alleged breach by the Holder of any obligation to the Borrower, and irrespective of any other circumstance which might otherwise limit such obligation of the Borrower to the Holder in connection with such conversion.

(d) Delivery of Common Stock by Electronic Transfer. In lieu of delivering physical certificates representing the Common Stock issuable upon conversion, provided the Borrower is participating in the Depository Trust Company ("DTC") Fast Automated Securities Transfer ("FAST") program, upon request of the Holder and its compliance with the provisions set forth herein, the Borrower shall use its best efforts to cause its transfer agent to electronically transmit the Common Stock issuable upon conversion to the Holder by crediting the account of Holder's Prime Broker with DTC through its Deposit and Withdrawal at Custodian ("DWAC") system.

(e) Failure to Deliver Common Stock Prior to Deadline. Without in any way limiting the Holder's right to pursue other remedies, including actual damages and/or equitable relief, the parties agree that if delivery of the Common Stock issuable upon conversion of this Note is not delivered by the Deadline due to action and/or inaction of the Borrower, the Borrower shall pay to the Holder \$2,000 per day in cash, for each day beyond the Deadline that the Borrower fails to deliver such Common Stock (the "Fail to Deliver Fee"); provided; however that the Fail to Deliver Fee shall not be due if the failure is a result of a third party (i.e., transfer agent; and not the result of any failure to pay such transfer agent) despite the best efforts of the Borrower to effect delivery of such Common Stock. Such cash amount shall be paid to Holder by the fifth day of the month following the month in which it has accrued or, at the option of the Holder (by written notice to the Borrower by the first day of the month following the month in which it has accrued), shall be added to the principal amount of this Note, in which event interest shall accrue thereon in accordance with the terms of this Note and such additional principal amount shall be convertible into Common Stock in accordance with the terms of this Note. The Borrower agrees that the right to convert is a valuable right to the Holder. The damages resulting from a failure, attempt to frustrate, interference with such conversion right are difficult if not impossible to qualify. Accordingly, the parties acknowledge that the liquidated damages provision contained in this Section 1.4(e) are justified.

1.5 Concerning the Shares. The shares of Common Stock issuable upon conversion of this Note may not be sold or transferred unless: (i) such shares are sold pursuant to an effective registration statement under the Act or (ii) the Borrower or its transfer agent shall have been furnished with an opinion of counsel (which opinion shall be in form, substance and scope customary for opinions of counsel in comparable transactions) to the effect that the shares to be sold or transferred may be sold or transferred pursuant to an exemption from such registration (such as Rule 144 or a successor rule) ("Rule 144"); or (iii) such shares are transferred to an "affiliate" (as defined in Rule 144) of the Borrower who agrees to sell or otherwise transfer the shares only in accordance with this Section 1.5 and who is an Accredited Investor (as defined in the Purchase Agreement).

Any restrictive legend on certificates representing shares of Common Stock issuable upon conversion of this Note shall be removed and the Borrower shall issue to the Holder a new certificate therefore free of any transfer legend if the Borrower or its transfer agent shall have received an opinion of counsel from Holder's counsel, in form, substance and scope customary for opinions of counsel in comparable transactions, to the effect that (i) a public sale or transfer of such Common Stock may be made without registration under the Act, which opinion shall be accepted by the Company so that the sale or transfer is effected; or (ii) in the case of the Common Stock issuable upon conversion of this Note, such security is registered for sale by the Holder under an effective registration statement filed under the Act; or otherwise may be sold pursuant to an exemption from registration. In the event that the Company does not reasonably accept the opinion of counsel provided by the Holder with respect to the transfer of Securities pursuant to an exemption from registration (such as Rule 144), at the Deadline, it will be considered an Event of Default pursuant to Section 3.2 of the Note.

1.6 Effect of Certain Events .

(a) Effect of Merger, Consolidation, Etc. At the option of the Holder, the sale, conveyance or disposition of all or substantially all of the assets of the Borrower, the effectuation by the Borrower of a transaction or series of related transactions in which more than 50% of the voting power of the Borrower is disposed of, or the consolidation, merger or other business combination of the Borrower with or into any other Person (as defined below) or Persons when the Borrower is not the survivor shall be deemed to be an Event of Default (as defined in Article III) pursuant to which the Borrower shall be required to pay to the Holder upon the consummation of and as a condition to such transaction an amount equal to the Default Amount (as defined in Article III). "Person" shall mean any individual, corporation, limited liability company, partnership, association, trust or other entity or organization.

(b) Adjustment Due to Merger, Consolidation, Etc. If, at any time when this Note is issued and outstanding and prior to conversion of all of the Note, there shall be any merger, consolidation, exchange of shares, recapitalization, reorganization, or other similar event, as a result of which shares of Common Stock of the Borrower shall be changed into the same or a different number of shares of another class or classes of stock or securities of the Borrower or another entity, or in case of any sale or conveyance of all or substantially all of the assets of the Borrower other than in connection with a plan of complete liquidation of the Borrower, then the Holder of this Note shall thereafter have the right to receive upon conversion of this Note, upon the basis and upon the terms and conditions specified herein and in lieu of the shares of Common Stock immediately theretofore issuable upon conversion, such stock, securities or assets which the Holder would have been entitled to receive in such transaction had this Note been converted in full immediately prior to such transaction (without regard to any limitations on conversion set forth herein), and in any such case appropriate provisions shall be made with respect to the rights and interests of the Holder of this Note to the end that the provisions hereof (including, without limitation, provisions for adjustment of the Conversion Price and of the number of shares issuable upon conversion of the Note) shall thereafter be applicable, as nearly as may be practicable in relation to any securities or assets thereafter deliverable upon the conversion hereof. The Borrower shall not affect any transaction described in this Section 1.6(b) unless (a) it first gives, to the extent practicable, ten (10) days prior written notice (but in any event at least five (5) days prior written notice) of the record date of the special meeting of shareholders to approve, or if there is no such record date, the consummation of, such merger, consolidation, exchange of shares, recapitalization, reorganization or other similar event or sale of assets (during which time the Holder shall be entitled to convert this Note) and (b) the resulting successor or acquiring entity (if not the Borrower) assumes by written instrument the obligations of this Note. The above provisions shall similarly apply to successive consolidations, mergers, sales, transfers or share exchanges.

(c) Adjustment Due to Distribution . If the Borrower shall declare or make any distribution of its assets (or rights to acquire its assets) to holders of Common Stock as a dividend, stock repurchase, by way of return of capital or otherwise (including any dividend or distribution to the Borrower's shareholders in cash or shares (or rights to acquire shares) of capital stock of a subsidiary (i.e., a spin-off)) (a "Distribution"), then the Holder of this Note shall be entitled, upon any conversion of this Note after the date of record for determining shareholders entitled to such Distribution, to receive the amount of such assets which would have been payable to the Holder with respect to the shares of Common Stock issuable upon such conversion had such Holder been the holder of such shares of Common Stock on the record date for the determination of shareholders entitled to such Distribution.

1.7 **Prepayment.** Notwithstanding anything to the contrary contained in this Note, at any time during the periods set forth on the table immediately following this paragraph (the “Prepayment Periods”), the Borrower shall have the right, exercisable on not more than three (3) Trading Days prior written notice to the Holder of the Note to prepay the outstanding Note (principal and accrued interest), in full, in accordance with this Section 1.7. Any notice of prepayment hereunder (an “Optional Prepayment Notice”) shall be delivered to the Holder of the Note at its registered addresses and shall state: (1) that the Borrower is exercising its right to prepay the Note, and (2) the date of prepayment which shall be not more than three (3) Trading Days from the date of the Optional Prepayment Notice. On the date fixed for prepayment (the “Optional Prepayment Date”), the Borrower shall make payment of the Optional Prepayment Amount (as defined below) to Holder, or upon the direction of the Holder as specified by the Holder in a writing to the Borrower (which direction shall to be sent to Borrower by the Holder at least one (1) business day prior to the Optional Prepayment Date). If the Borrower exercises its right to prepay the Note, the Borrower shall make payment to the Holder of an amount in cash equal to the percentage (“Prepayment Percentage”) as set forth in the table immediately following this paragraph opposite the applicable Prepayment Period, multiplied by the sum of: (w) the then outstanding principal amount of this Note plus (x) accrued and unpaid interest on the unpaid principal amount of this Note to the Optional Prepayment Date plus (y) Default Interest, if any, on the amounts referred to in clauses (w) and (x) plus (z) any amounts owed to the Holder pursuant to Section 1.4 hereof (the “Optional Prepayment Amount”). If the Borrower delivers an Optional Prepayment Notice and fails to pay the Optional Prepayment Amount due to the Holder of the Note within two (2) business days following the Optional Prepayment Date, the Borrower shall forever forfeit its right to prepay the Note pursuant to this Section 1.7.

<u>Prepayment Period</u>	<u>Prepayment Percentage</u>
1. The period beginning on the Issue Date and ending on the date which is thirty (30) days following the Issue Date.	110%
2. The period beginning on the date which is thirty-one (31) days following the Issue Date and ending on the date which is sixty (60) days following the Issue Date.	115%
3. The period beginning on the date which is sixty-one (61) days following the Issue Date and ending on the date which is ninety (90) days following the Issue Date.	120%
4. The period beginning on the date that is ninety-one (91) day from the Issue Date and ending one hundred twenty (120) days following the Issue Date.	125%
5. The period beginning on the date that is one hundred twenty-one (121) day from the Issue Date and ending one hundred fifty (150) days following the Issue Date.	130%
6. The period beginning on the date that is one hundred fifty-one (151) day from the Issue Date and ending one hundred eighty (180) days following the Issue Date.	135%

After the expiration of one hundred eighty (180) days following the Issue Date, the Borrower shall have no right of prepayment.

ARTICLE II. CERTAIN COVENANTS

2.1 **Sale of Assets.** So long as the Borrower shall have any obligation under this Note, the Borrower shall not, without the Holder’s written consent, sell, lease or otherwise dispose of any significant portion of its assets outside the ordinary course of business. Any consent to the disposition of any assets may be conditioned on a specified use of the proceeds of disposition.

ARTICLE III. EVENTS OF DEFAULT

If any of the following events of default (each, an “Event of Default”) shall occur:

3.1 Failure to Pay Principal and Interest. The Borrower fails to pay the principal hereof or interest thereon when due on this Note, whether at maturity or upon acceleration and such breach continues for a period of five (5) days after written notice from the Holder.

3.2 Conversion and the Shares. The Borrower fails to issue shares of Common Stock to the Holder (or announces or threatens in writing that it will not honor its obligation to do so) upon exercise by the Holder of the conversion rights of the Holder in accordance with the terms of this Note, fails to transfer or cause its transfer agent to transfer (issue) (electronically or in certificated form) any certificate for shares of Common Stock issued to the Holder upon conversion of or otherwise pursuant to this Note as and when required by this Note, the Borrower directs its transfer agent not to transfer or delays, impairs, and/or hinders its transfer agent in transferring (or issuing) (electronically or in certificated form) any certificate for shares of Common Stock to be issued to the Holder upon conversion of or otherwise pursuant to this Note as and when required by this Note, or fails to remove (or directs its transfer agent not to remove or impairs, delays, and/or hinders its transfer agent from removing) any restrictive legend (or to withdraw any stop transfer instructions in respect thereof) on any certificate for any shares of Common Stock issued to the Holder upon conversion of or otherwise pursuant to this Note as and when required by this Note (or makes any written announcement, statement or threat that it does not intend to honor the obligations described in this paragraph) and any such failure shall continue uncured (or any written announcement, statement or threat not to honor its obligations shall not be rescinded in writing) for two (2) business days after the Holder shall have delivered a Notice of Conversion. It is an obligation of the Borrower to remain current in its obligations to its transfer agent. It shall be an event of default of this Note, if a conversion of this Note is delayed, hindered or frustrated due to a balance owed by the Borrower to its transfer agent. If at the option of the Holder, the Holder advances any funds to the Borrower’s transfer agent in order to process a conversion, such advanced funds shall be paid by the Borrower to the Holder within forty-eight (48) hours of a demand from the Holder.

3.3 Breach of Covenants. The Borrower breaches any material covenant or other material term or condition contained in this Note and any collateral documents including but not limited to the Purchase Agreement and such breach continues for a period of twenty (20) days after written notice thereof to the Borrower from the Holder.

3.4 Breach of Representations and Warranties. Any representation or warranty of the Borrower made herein or in any agreement, statement or certificate given in writing pursuant hereto or in connection herewith (including, without limitation, the Purchase Agreement), shall be false or misleading in any material respect when made and the breach of which has (or with the passage of time will have) a material adverse effect on the rights of the Holder with respect to this Note or the Purchase Agreement.

3.5 Receiver or Trustee. The Borrower or any subsidiary of the Borrower shall make an assignment for the benefit of creditors, or apply for or consent to the appointment of a receiver or trustee for it or for a substantial part of its property or business, or such a receiver or trustee shall otherwise be appointed.

3.6 Bankruptcy. Bankruptcy, insolvency, reorganization or liquidation proceedings or other proceedings, voluntary or involuntary, for relief under any bankruptcy law or any law for the relief of debtors shall be instituted by or against the Borrower or any subsidiary of the Borrower.

3.7 Delisting of Common Stock. The Borrower shall fail to maintain the listing of the Common Stock on at least one of the OTC (which specifically includes the quotation platforms maintained by the OTC Markets Group) or an equivalent replacement exchange, the Nasdaq National Market, the Nasdaq SmallCap Market, the New York Stock Exchange, or the American Stock Exchange.

3.8 Failure to Comply with the Exchange Act. The Borrower shall fail to comply with the reporting requirements of the Exchange Act; and/or the Borrower shall cease to be subject to the reporting requirements of the Exchange Act.

3.9 Liquidation. Any dissolution, liquidation, or winding up of Borrower or any substantial portion of its business.

3.10 Cessation of Operations. Any cessation of operations by Borrower or Borrower admits it is otherwise generally unable to pay its debts as such debts become due, provided, however, that any disclosure of the Borrower's ability to continue as a "going concern" shall not be an admission that the Borrower cannot pay its debts as they become due.

3.11 Financial Statement Restatement. The restatement of any financial statements filed by the Borrower with the SEC at any time after 180 days after the Issuance Date for any date or period until this Note is no longer outstanding, if the result of such restatement would, by comparison to the un-restated financial statement, have constituted a material adverse effect on the rights of the Holder with respect to this Note or the Purchase Agreement.

3.12 Replacement of Transfer Agent. In the event that the Borrower proposes to replace its transfer agent, the Borrower fails to provide, prior to the effective date of such replacement, a fully executed Irrevocable Transfer Agent Instructions in a form as initially delivered pursuant to the Purchase Agreement (including but not limited to the provision to irrevocably reserve shares of Common Stock in the Reserved Amount) signed by the successor transfer agent to Borrower and the Borrower.

3.13 Cross-Default. Notwithstanding anything to the contrary contained in this Note or the other related or companion documents, a breach or default by the Borrower of any covenant or other term or condition contained in any of the Other Agreements, after the passage of all applicable notice and cure or grace periods, shall, at the option of the Holder, be considered a default under this Note and the Other Agreements, in which event the Holder shall be entitled (but in no event required) to apply all rights and remedies of the Holder under the terms of this Note and the Other Agreements by reason of a default under said Other Agreement or hereunder. "Other Agreements" means, collectively, all agreements and instruments between, among or by: (1) the Borrower, and, or for the benefit of, (2) the Holder and any affiliate of the Holder, including, without limitation, promissory notes; provided, however, the term "Other Agreements" shall not include the related or companion documents to this Note. Each of the loan transactions will be cross-defaulted with each other loan transaction and with all other existing and future debt of Borrower to the Holder.

Upon the occurrence and during the continuation of any Event of Default specified in Section 3.1 (solely with respect to failure to pay the principal hereof or interest thereon when due at the Maturity Date), the Note shall become immediately due and payable and the Borrower shall pay to the Holder, in full satisfaction of its obligations hereunder, an amount equal to the Default Amount (as defined herein). UPON THE OCCURRENCE AND DURING THE CONTINUATION OF ANY EVENT OF DEFAULT SPECIFIED IN SECTION 3.2, THE NOTE SHALL BECOME IMMEDIATELY DUE AND PAYABLE AND THE BORROWER SHALL PAY TO THE HOLDER, IN FULL SATISFACTION OF ITS OBLIGATIONS HEREUNDER, AN AMOUNT EQUAL TO: (Y) THE DEFAULT AMOUNT (AS DEFINED HEREIN); MULTIPLIED BY (Z) TWO (2). Upon the occurrence and during the continuation of any Event of Default specified in Sections 3.1 (solely with respect to failure to pay the principal hereof or interest thereon when due on this Note or upon acceleration), 3.3, 3.4, 3.7, 3.8, 3.10, 3.11, 3.12, 3.13, and/or 3.14 exercisable through the delivery of written notice to the Borrower by such Holders (the “Default Notice”), and upon the occurrence of an Event of Default specified the remaining sections of Articles III (other than failure to pay the principal hereof or interest thereon at the Maturity Date specified in Section 3.1 hereof), the Note shall become immediately due and payable and the Borrower shall pay to the Holder, in full satisfaction of its obligations hereunder, an amount equal to the greater of (i) 150% times the sum of (w) the then outstanding principal amount of this Note plus (x) accrued and unpaid interest on the unpaid principal amount of this Note to the date of payment (the “Mandatory Prepayment Date”) plus (y) Default Interest, if any, on the amounts referred to in clauses (w) and/or (x) plus (z) any amounts owed to the Holder pursuant to Section 1.4(e) hereof (the then outstanding principal amount of this Note to the date of payment plus the amounts referred to in clauses (x), (y) and (z) shall collectively be known as the “Default Amount”) and all other amounts payable hereunder shall immediately become due and payable, all without demand, presentment or notice, all of which hereby are expressly waived, together with all costs, including, without limitation, legal fees and expenses, of collection, and the Holder shall be entitled to exercise all other rights and remedies available at law or in equity.

If the Borrower fails to pay the Default Amount within five (5) business days of written notice that such amount is due and payable, then the Holder shall have the right at any time, so long as the Borrower remains in default (and so long and to the extent that there are sufficient authorized shares), to require the Borrower, upon written notice, to immediately issue, in lieu of the Default Amount, the number of shares of Common Stock of the Borrower equal to the Default Amount divided by the Conversion Price then in effect.

ARTICLE IV. MISCELLANEOUS

4.1 Failure or Indulgence Not Waiver. No failure or delay on the part of the Holder in the exercise of any power, right or privilege hereunder shall operate as a waiver thereof, nor shall any single or partial exercise of any such power, right or privilege preclude other or further exercise thereof or of any other right, power or privileges. All rights and remedies existing hereunder are cumulative to, and not exclusive of, any rights or remedies otherwise available.

4.2 Notices. All notices, demands, requests, consents, approvals, and other communications required or permitted hereunder shall be in writing and, unless otherwise specified herein, shall be (i) personally served, (ii) deposited in the mail, registered or certified, return receipt requested, postage prepaid, (iii) delivered by reputable air courier service with charges prepaid, or (iv) transmitted by hand delivery, telegram, or facsimile, addressed as set forth below or to such other address as such party shall have specified most recently by written notice. Any notice or other communication required or permitted to be given hereunder shall be deemed effective (a) upon hand delivery or delivery by facsimile, with accurate confirmation generated by the transmitting facsimile machine, at the address or number designated below (if delivered on a business day during normal business hours where such notice is to be received), or the first business day following such delivery (if delivered other than on a business day during normal business hours where such notice is to be received) or (b) on the second business day following the date of mailing by express courier service, fully prepaid, addressed to such address, or upon actual receipt of such mailing, whichever shall first occur. The addresses for such communications shall be:

If to the Borrower, to:

Ascent Solar Technologies, Inc.
12300 Grant Street
Thornton, CO 80241
Attn: Victor Lee, Chief Executive Officer
Fax:
Email: Victor.Lee@ascentsolar.com

If to the Holder:

POWER UP LENDING GROUP LTD.
111 Great Neck Road, Suite 214
Great Neck, NY 11021
Attn: Curt Kramer, Chief Executive Officer
e-mail: info@poweruplending.com

With a copy by fax only to (which copy shall not constitute notice):

Naidich Wurman LLP
111 Great Neck Road, Suite 216
Great Neck, NY 11021
Attn: Allison Naidich
facsimile: 516-466-3555
e-mail: allison@nwlaw.com

4.3 Amendments. This Note and any provision hereof may only be amended by an instrument in writing signed by the Borrower and the Holder. The term "Note" and all reference thereto, as used throughout this instrument, shall mean this instrument (and the other Notes issued pursuant to the Purchase Agreement) as originally executed, or if later amended or supplemented, then as so amended or supplemented.

4.4 Most Favored Nation. During the period where any monies are owed to the Holder pursuant to this Note, if the Borrower engages in any future financing transactions with a third party investor, the Borrower will provide the Holder with written notice (the "MFN Notice") thereof promptly but in no event less than 10 days prior to closing any financing transactions. Included with the MFN Notice shall be

a copy of all documentation relating to such financing transaction and shall include, upon written request of the Holder, any additional information related to such subsequent investment as may be reasonably requested by the Holder. In the event the Holder determines that the terms of the subsequent investment are preferable to the terms of the securities of the Borrower issued to the Holder pursuant to the terms of the Purchase Agreement, the Holder will notify the Borrower in writing. Promptly after receipt of such written notice from the Holder, the Borrower agrees to amend and restate the Securities (which may include the conversion terms of this Note), to be identical to the instruments evidencing the subsequent investment. Notwithstanding the foregoing, this Section 4.4 shall not apply in respect of (i) an Exempt Issuance, or (ii) an underwritten public offering of Common Stock. **“Exempt Issuance”** means the issuance of: (a) shares of Common Stock or options to employees, officers, consultants, advisors or directors of the Borrower pursuant to any stock or option plan duly adopted for such purpose by a majority of the members of the Board of Directors or a majority of the members of a committee of directors established for such purpose, (b) securities upon the exercise or exchange of or conversion of this Note and/or other securities exercisable or exchangeable for or convertible into shares of Common Stock issued and outstanding on the date hereof, and (c) securities issued pursuant to acquisitions or strategic transactions approved by a majority of the disinterested directors of the Borrower, provided that any such issuance shall only be to a Person which is, itself or through its subsidiaries, an operating company in a business synergistic with the business of the Borrower and in which the Borrower receives benefits in addition to the investment of funds, but shall not include a transaction in which the Borrower is issuing securities primarily for the purpose of raising capital or to an entity whose primary business is investing in securities.

4.5 Assignability. This Note shall be binding upon the Borrower and its successors and assigns, and shall inure to be the benefit of the Holder and its successors and assigns. Each transferee of this Note must be an “accredited investor” (as defined in Rule 501(a) of the Securities and Exchange Commission). Notwithstanding anything in this Note to the contrary, this Note may be pledged as collateral in connection with a bona fide margin account or other lending arrangement; and may be assigned by the Holder without the consent of the Borrower.

4.6 Cost of Collection. If default is made in the payment of this Note, the Borrower shall pay the Holder hereof costs of collection, including reasonable attorneys’ fees.

4.7 Governing Law. This Note shall be governed by and construed in accordance with the laws of the State of Virginia without regard to principles of conflicts of laws. Any action brought by either party against the other concerning the transactions contemplated by this Note shall be brought only in the state courts of New York or in the federal courts located in the Eastern District of New York. The parties to this Note hereby irrevocably waive any objection to jurisdiction and venue of any action instituted hereunder and shall not assert any defense based on lack of jurisdiction or venue or based upon *forum non conveniens*. The Borrower and Holder waive trial by jury. The prevailing party shall be entitled to recover from the other party its reasonable attorney's fees and costs. In the event that any provision of this Note or any other agreement delivered in connection herewith is invalid or unenforceable under any applicable statute or rule of law, then such provision shall be deemed inoperative to the extent that it may conflict therewith and shall be deemed modified to conform with such statute or rule of law. Any such provision which may prove invalid or unenforceable under any law shall not affect the validity or enforceability of any other provision of any agreement. Each party hereby irrevocably waives personal service of process and consents to process being served in any suit, action or proceeding in connection with this Note, any agreement or any other document delivered in connection with this Note by mailing a copy thereof via registered or certified mail or overnight delivery (with evidence of delivery) to such party at the address in effect for notices to it under this Note and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any other manner permitted by law.

4.8 Purchase Agreement. By its acceptance of this Note, each party agrees to be bound by the applicable terms of the Purchase Agreement.

4.9 Remedies. The Borrower acknowledges that a breach by it of its obligations hereunder will cause irreparable harm to the Holder, by vitiating the intent and purpose of the transaction contemplated hereby. Accordingly, the Borrower acknowledges that the remedy at law for a breach of its obligations under this Note will be inadequate and agrees, in the event of a breach or threatened breach by the Borrower of the provisions of this Note, that the Holder shall be entitled, in addition to all other available remedies at law or in equity, and in addition to the penalties assessable herein, to an injunction or injunctions restraining, preventing or curing any breach of this Note and to enforce specifically the terms and provisions thereof, without the necessity of showing economic loss and without any bond or other security being required.

IN WITNESS WHEREOF, Borrower has caused this Note to be signed in its name by its duly authorized officer this on February 14, 2019

Ascent Solar Technologies, Inc.

By: /s/Victor Lee
Victor Lee
Chief Executive Officer

EXHIBIT A -- NOTICE OF CONVERSION

The undersigned hereby elects to convert \$_____ principal amount of the Note (defined below) into that number of shares of Common Stock to be issued pursuant to the conversion of the Note ("Common Stock") as set forth below, of Ascent Solar Technologies, Inc., a Delaware corporation (the "Borrower") according to the conditions of the convertible note of the Borrower dated as of February 14, 2019 (the "Note"), as of the date written below. No fee will be charged to the Holder for any conversion, except for transfer taxes, if any.

Box Checked as to applicable instructions:

- ☐ The Borrower shall electronically transmit the Common Stock issuable pursuant to this Notice of Conversion to the account of the undersigned or its nominee with DTC through its Deposit Withdrawal Agent Commission system ("DWAC Transfer").

Name of DTC Prime Broker:

Account Number:

- ☐ The undersigned hereby requests that the Borrower issue a certificate or certificates for the number of shares of Common Stock set forth below (which numbers are based on the Holder's calculation attached hereto) in the name(s) specified immediately below or, if additional space is necessary, on an attachment hereto:

POWER UP LENDING GROUP LTD.
111 Great Neck Road, Suite 214
Great Neck, NY 11021
Attention: Certificate Delivery
e-mail: info@poweruplendinggroup.com

Date of conversion: _____
Applicable Conversion Price: \$ _____
Number of shares of common stock to be issued
pursuant to conversion of the Notes: _____
Amount of Principal Balance due remaining
under the Note after this conversion: _____

POWER UP LENDING GROUP LTD.

By: _____
Name: Curt Kramer
Title: Chief Executive Officer
Date: _____

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the Registration Statements of Ascent Solar Technologies, Inc. on Forms S-8 (Nos. 333-142768, 333-152642, 333-152643, 333-161794, 333-171355, 333-171356, 333-182410 and 333-205516), of our report dated March 29, 2018 relating to our audit of the consolidated financial statements, which appears in this Annual Report on Form 10-K for the year ended December 31, 2018.

/s/ Haynie & Company

Denver, Colorado
April 16, 2019

ASCENT SOLAR TECHNOLOGIES, INC.
CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350
AS ADOPTED PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Victor Lee, certify that:

1. I have reviewed this Annual Report on Form 10-K of Ascent Solar Technologies, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officers and I have disclosed, based on our most recent evaluation, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

April 16, 2019

/s/ VICTOR LEE

Victor Lee
President and Chief Executive Officer
(Principal Executive Officer, Principal Financial Officer, Chief Accounting Officer, and Authorized Signatory)

ASCENT SOLAR TECHNOLOGIES, INC.
CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350
AS ADOPTED PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Victor Lee, certify that:

1. I have reviewed this Annual Report on Form 10-K of Ascent Solar Technologies, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officers and I have disclosed, based on our most recent evaluation, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

April 16, 2019

/s/ VICTOR LEE

Victor Lee

President and Chief Executive Officer

(Principal Executive Officer, Principal Financial Officer, Chief Accounting Officer, and Authorized Signatory)

ASCENT SOLAR TECHNOLOGIES, INC.

**CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350 AS ADOPTED PURSUANT
TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report of Ascent Solar Technologies, Inc. (the “Company”) on Form 10-K for the period ended December 31, 2018 as filed with the Securities and Exchange Commission on the date therein specified (the “Report”), I, Victor Lee, President, Chief Executive Officer and acting Principal Financial Officer of the Company, certify pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

- 1 The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- 2 The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

April 16, 2019

/s/ VICTOR LEE

Victor Lee

President and Chief Executive Officer

(Principal Executive Officer, Principal Financial Officer, Chief Accounting Officer, and Authorized Signatory)

ASCENT SOLAR TECHNOLOGIES, INC.

**CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350 AS ADOPTED PURSUANT
TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report of Ascent Solar Technologies, Inc. (the “Company”) on Form 10-K for the period ended December 31, 2018 as filed with the Securities and Exchange Commission on the date therein specified (the “Report”), I, Victor Lee, President, Chief Executive Officer and acting Principal Financial Officer of the Company, certify pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

- 1 The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- 2 The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

April 16, 2019

/s/ VICTOR LEE

Victor Lee

President and Chief Executive Officer

(Principal Executive Officer, Principal Financial Officer, Chief Accounting Officer, and Authorized Signatory)