

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, 2021

or

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

For the Transition Period from to

Commission File 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)**

12300 Grant Street, Thornton, CO

(Address of principal executive offices)

20-3672603

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

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	Trading Symbol(s)	Name of exchange on which registered
Common Stock, \$0.0001 par value per share	ASTI	OTC Markets Group

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 every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). ☒ Yes ☐ No

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

Large accelerated filer	<input type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input checked="" type="checkbox"/>	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 has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☐

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, 2021, 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 \$91,371,601 based upon the last reported sale price of the registrant's common stock on that date as reported by OTC Markets Group ("OTC Markets").

As of March 14, 2022, there were 30,586,804 shares of our common stock issued and outstanding.

ASCENT SOLAR TECHNOLOGIES, INC.
Form 10-K Annual Report
for the Fiscal Year ended December 31, 2021
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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, but the absence of these words does not mean that a statement is not forward-looking. 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:

- The impact of the COVID-19 pandemic on our business, results of operations, cash flows, financial condition and liquidity;
- Our operating history and lack of profitability;
- The substantial doubt about our ability to continue as a going concern due to our history of operating losses;
- 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, 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 compliance with the OTC Markets listing standards;
- 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 maintain effective internal controls over financial reporting;
- General economic and business conditions, and in particular, conditions specific to the solar power industry;
- Potential litigation; 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

We target high-value specialty solar markets. These include aerospace, defense, emergency management and consumer/OEM applications. This strategy enables us to fully leverage what we believe are the unique advantages of our technology, including flexibility, durability and attractive power to weight and power to area performance. It further enables us to offer unique, differentiated solutions in large markets with less competition, and more attractive pricing.

Specifically, we focus on commercializing our proprietary solar technology in three highest-value PV verticals:

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

We believe 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 airships and fixed-wing UAVs. Ascent sees significant overlap in the needs of end users across some of these verticals and believes it 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.

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, which is significant in that it demonstrates true production capability where these modules are processed side-by-side. In contrast, devices tested under laboratory conditions are usually small area in nature measuring 1 centimeter by 1 centimeter or less. 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 of approximately 15 centimeters wide by 30 centimeters long measured 10.4% in conversion efficiency. 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 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 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, Ascent manufactured a new micro-module for a space customer, 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, we believe 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, we collaborated with a European based customer for their lighter-than-air, helium-filled airship project, which was based on our newly developed ultra-light modules with substrate material that was half of the thickness of our standard modules. In 2019, we completed a repeat order from the same customer who had since established its airship development operation in the US. In 2020, we received a third and enlarged order from the same customer and completed the order in the second quarter of 2021. Most recently, in the 4th quarter of 2021 we received a fourth order with a targeted ship date in the 2nd quarter of 2022.

On September 15, 2021, the Company entered into a Long-Term Supply and Joint Development Agreement ("JDA") with TubeSolar AG ("TubeSolar"), a significant existing stakeholder in the Company. Under the terms of the JDA, the Company will produce, and TubeSolar will purchase, thin-film PV foils ("PV Foils") for use in TubeSolar's solar modules for agricultural photovoltaic ("APV") applications that require solar foils for its production. Under the JDA, the Company will receive up (i) to \$4 million of non-recurring engineering ("NRE") fees, (ii) up to \$13.5 million of payments upon achievement of certain agreed production and cost structure milestones, and (iii) product revenues from sales of PV Foils to TubeSolar. The JDA has no fixed term, and may only be terminated by either party for breach.

The Company and TubeSolar have also jointly established a subsidiary company in Germany, in which TubeSolar holds a minority stake of 30% (the "JV"). The purpose of the JV is to establish and operate a PV manufacturing facility in Germany that will produce and deliver PV Foils exclusively to TubeSolar. Until the JV facility is fully operational, PV Foils will be manufactured in the Company's existing facility in Thornton, Colorado. The parties expect to jointly develop next generation tooling for use in manufacturing PV Foils at the JV facility. The Company purchased 17,500 shares of the JV for 1 Euro per share, on November 10, 2021.

We continue to design and manufacture PV integrated portable power applications for commercial and military users, including the US Marine Corps, US AF Special Operations Command, US Special Operations Command, US Army Special Operations Command, US Army Futures Command, and others. Due to the high durability enabled by the monolithic integration employed by our technology, the capability to customize modules into different form factors and what we believe is the industry leading light weight and flexibility provided by our modules, we believe that the potential applications for our products are extensive, including anywhere that may need power generation such as in disaster recovery and emergency preparedness, commercial and personal adventure expeditions to remote areas, humanitarian efforts in areas with poor power infrastructure, photography and filming involved in wildlife observation, to name a few.

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.

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, is unsuitable for a number of our applications. We also believe CIGS can achieve higher conversion efficiencies than CdTe in production.

We believe 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 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 enable us to produce extremely robust, light and flexible products.

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 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 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

We target high-value specialty solar markets. These include aerospace, defense, emergency management and consumer/OEM applications. This 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 further enables us to offer unique, differentiated solutions in large markets with less competition, and more attractive pricing.

Specifically, we focus on commercializing our proprietary solar technology in three highest-value PV verticals:

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

We believe 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 airships and fixed-wing UAVs. Ascent sees significant overlap in the needs of end users across some of these verticals and believes it 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 bare modules, achieving a power-to-weight ratio of 1,700 watts per kilogram at AM0 environment. What we believe is the “best-in-class” specific power is crucial to the aerospace industry where every pound of weight reduction would translate to incremental cost savings or increased in payloads. 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 what we believe is 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. We continue to receive testing orders from JAXA.

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 seek 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 we believe 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 develop the landscape of mobile solar power generation with advanced technology end products.

During 2021, the ASTI team further advanced product acceptance into the highly stringent space market with demonstrated solar module survivability under the guidance of NASA Marshall Space Flight Center (MSFC) MISSE X flight experiment on the International Space Station (ISS), advancing our Technology Readiness Level (TRL) to 6, with subsequent flights in 2022-23, both NASA and commercial, intended to achieve TRL 7. TRL 8 is commonly accepted as space qualified. Also during 2021, the ASTI team was able to utilize an ultra-thin lamination made from the coating material used during MISSE X to build custom modules for a customer to be tested for a future flight.

Competition

We have pivoted 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 2019, crystalline silicon PV technology represented over 90% of global market revenue and 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 consider PowerFilm Solar, Global Solar, MiaSolé, and Flisom to be our closest competitors in terms of technology in the specialty PV market.

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 the years ended December 31, 2021 and 2020 we incurred approximately \$4,140,319 and \$1,165,193, 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:

Issued Patents and Registrations

- 1 US Patent No. 9,640,692 entitled "Flexible Photovoltaic Array with Integrated Wiring and Control Circuitry, and Associated Methods" (issued October 12, 2010) (co-owned with PermaCity Corporation)
- 2 US Patent No. 8,426,725 entitled "Apparatus and Method for Hybrid Photovoltaic Device Having Multiple, Stacked, Heterogeneous, Semiconductor Junctions" (issued April 23, 2013)
- 3 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)
- 4 US Patent No. D697,502 entitled "Mobile Electronic Device Case" (issued January 14, 2014)
- 5 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)
- 6 US Patent No. D781,228 entitled Pocket-Sized Photovoltaic Based Fully Integrated Portable Power System (issued March 14, 2017)
- 7 US Patent No. 9,601,650 entitled Machine and Process for Continuous, Sequential, Deposition of Semiconductor Solar Absorbers Having Variable Semiconductor Composition Deposited in Multiple Sublayers (issued March 21, 2017)
- 8 US Patent No. 9,634,175 entitled Systems and Methods for Thermally Managing High-Temperature Processes on Temperature Sensitive Substrates (issued April 25, 2017)
- 9 US Patent No. 9,640,706 entitled Hybrid Multi-Junction Photovoltaic Cells and Associated Methods (issued May 2, 2017)
- 10 US Patent No. 9,640,692 entitled Flexible Photovoltaic Array with Integrated Wiring and Control Circuitry, and Associated Methods (issued May 2, 2017)
- 11 US Patent No. 9,653,635 entitled Flexible High-Voltage Adaptable Current Photovoltaic Modules and Associated Methods (issued May 16, 2017)
- 12 US Patent No. 9,780,242 entitled "Multilayer Thin-Film Back Contact System for Flexible Photovoltaic Devices on Polymer Substrates" (issued October 3, 2017)

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, 2021, we had 51 full-time and 3 part-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. Such filings are available to the public over the internet at the SEC's website at <http://www.sec.gov>. 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 related to the Coronavirus and COVID-19 Pandemic

The COVID-19 pandemic in the United States and world-wide has caused business disruption which may negatively impact the Company's operations and financial results. Public health officials have recommended and mandated precautions to mitigate the spread of COVID-19, including prohibitions on travel, congregating in heavily populated areas and stay-at-home orders or similar measures.

The COVID-19 pandemic affected the Company in many ways just as the whole world experienced. These included but were not limited to:

- Severe disruption to our restructuring and recapitalization efforts due to travel restrictions and lock-down measures implemented by authorities across the globe;
- Disruption to workforce scheduling and recruitment initiatives after new capital was secured;
- Longer lead time and higher cost in raw materials and equipment parts;
- Raising labor cost in line with overall inflation witnessed across the nation; and
- Extended products and development cycle and longer delivery time to our customers.

These and other impacts of the COVID-19 pandemic could have the effect of heightening many of the other risk factors disclosed in this Annual Report on Form 10-K. The ultimate impact depends on the severity and duration of the current COVID-19 pandemic and actions taken by governmental authorities and other third parties in response, each of which is uncertain, rapidly changing and difficult to predict. Any of these disruptions could adversely impact our business and results of operations.

Risks Relating to Our Business

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, 2021, our cash used in operations was \$9,404,443. At December 31, 2021, we had cash and equivalents on hand of \$5,961,760.

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. Product revenues did not result in a positive cash flow for the 2021 year, and are not anticipated to result in a positive cash flow for the next twelve months.

During 2021 and 2020, we entered into multiple financing agreements to fund operations, raising an aggregate of \$18,250,000 in net proceeds. We do not expect that sales revenue and cash flows will be sufficient to support operations and cash requirements for the foreseeable future, and we will depend on raising additional capital to maintain operations until we become profitable. 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.

Our auditors have expressed substantial doubt about our ability to continue as a going concern. Our auditors' report on our December 31, 2021 consolidated financial statements expresses an opinion that our capital resources as of the date of their audit report were not sufficient to sustain operations or complete our planned activities for the year 2022 unless we raised additional funds. Additionally, 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 doubt as to the Company's ability to continue as a going concern. Management cannot provide any assurances that the Company will be successful in accomplishing any of its plans. Our December 31, 2021 consolidated financial statements do not include any adjustments that might be necessary should the Company be unable to continue as a going concern.

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. 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 OTC Markets;
- 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 \$6,000,003 for the year ended December 31, 2021 and reported an accumulated deficit of \$427,782,788 as of December 31, 2021. 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 operations 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 date, we have not formed such strategic alliances and can give no assurances that we will be able to do so. 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 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 currently dominated by the rigid crystalline silicon based technology. The extent to which our flexible thin film PV modules will be widely adopted is uncertain. Many factors, of which several are outside of our control, may affect the viability of widespread adoption and demand for our flexible 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.

Third-party claims of intellectual property infringement may negatively impact the Company and the Company's future financial results. The Company's commercial success depends in part on its ability to develop, manufacture, market and sell its products and use its proprietary technology without infringing the patent rights of third parties. Numerous third-party U.S. and non-U.S. issued patents and pending applications exist in the area of the Company's products. The Company may in the future pursue available proceedings in the U.S. and foreign patent offices to challenge the validity of patents and patent applications. In addition, or alternatively, the Company may consider whether to seek to negotiate a license of rights to technology covered by one or more of such patents and patent applications. If any patents or patent applications cover the Company's products or technologies, the Company may not be free to manufacture or market its products as planned, absent such a license, which may not be available to the Company on commercially reasonable terms, or at all.

It is also possible that the Company has failed to identify relevant third-party patents or applications. For example, some applications may be held under government secrecy and US patent applications that will not be filed outside the United States remain confidential unless and until patents issue. Moreover, it is difficult for industry participants, including the Company, to identify all third-party patent rights that may be relevant to its product candidates and technologies because patent searching is imperfect due to differences in terminology among patents, incomplete databases and the difficulty in assessing the meaning

of patent claims. The Company may fail to identify relevant patents or patent applications or may identify pending patent applications of potential interest but incorrectly predict the likelihood that such patents may issue with claims of relevance to its technology. In addition, the Company may be unaware of one or more issued patents that would be infringed by the manufacture, sale or use of a current or future products, or the Company may incorrectly conclude that a third-party patent is invalid, unenforceable or not infringed by its activities. Additionally, pending patent applications that have been published can, subject to specified limitations, be later amended in a manner that could cover the Company's technologies, its products or the use of its products.

There have been many lawsuits and other proceedings filed by third parties involving patent and other intellectual property rights, including patent infringement lawsuits, interferences, oppositions, and reexamination, post-grant review and equivalent proceedings before the USPTO and corresponding foreign patent offices. Numerous U.S. and foreign issued patents and pending patent applications, which are owned by third parties, exist in the fields in which the Company is developing products or has existing products. As the industries the Company is involved in expand and more patents are issued, the risk increases that its product candidates may be subject to claims of infringement of the patent rights of third parties.

Parties making claims against the Company may obtain injunctive or other equitable relief, which could effectively block its ability to further develop and commercialize the Company's products. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from the Company's business. In the event of a successful claim of infringement against the Company, the Company may have to pay substantial damages, including treble damages and attorneys' fees for willful infringement, pay royalties, redesign its infringing products or obtain one or more licenses from third parties, which may be impossible or require substantial time and monetary expenditure.

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 Chief Executive Officer is also employed by another company. Our Chief Executive Officer serves as chief financial officer of another unrelated public company. This employment may compete for our Chief Executive Officer's full attention to the Company. The Chief Executive Officer is only required to devote as much time and attention to the affairs of the Company as he deems appropriate and may engage in other business activities and/or other unrelated employment.

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 entered into the JDA with TubeSolar, a related party (see “Item 1 Business” for additional detail), and 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 may be subject to risks related to our information technology systems, including the risk that we may be the subject of a cyber-attack and the risk that we may be in non-compliance with applicable privacy laws. Our operations depend, in part, on how well we and our vendors protect networks, equipment, information technology (IT) systems, and software against damage from a number of threats, including, but not limited to, cable cuts, damage to physical plants, natural disasters, intentional damage and destruction, fire, power loss, hacking, computer viruses, vandalism, theft, malware, ransomware and phishing attacks. Any of these and other events could result in IT system failures, delays, or increases in capital expenses. Our operations also depend on the timely maintenance, upgrade, and replacement of networks, equipment, and IT systems and software, as well as preemptive expenses to mitigate the risks of failures. The failure of IT systems or a component of IT systems could, depending on the nature of any such failure, adversely impact our reputation and results of operations.

We recently remediated material weaknesses in our internal control over financial reporting. If our remediation efforts were 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, 2020 and March 31, 2021, 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 consolidated financial statements will not be prevented or detected on a timely basis. We remediated our material weakness and reported our remediation at June 30, 2021. At December 31, 2021, we concluded that the design and operation of our disclosure controls and procedures were effective. See Item 9A in Part II of this Annual Report on Form 10-K for details.

While we believe that the substantial elimination of the complexities in the Company's debt and securities accounting along with changes in internal controls over financial reporting during the period from April 1, 2021 to December 31, 2021, have materially improved the Company's internal control over financial reporting, and have effectively remediated the Company's prior material weaknesses, we cannot assure that these or other measures will fully remediate, or have fully remediated, the deficiencies or material weaknesses. We cannot assure you that we have identified all of our existing significant deficiencies and material weaknesses, or that we will not in the future have additional significant deficiencies or material weaknesses. If we are unable to remediate a material weakness, or otherwise maintain effective internal control over financial reporting, we may not be able to report our financial results accurately, prevent fraud, or file our periodic reports in a timely manner.

As long as our significant stockholders, BD 1 Investment Holding, LLC ("BD1"), Crowdex Investment, LLC ("Crowdex") and TubeSolar, maintain their current holdings, the ability of our other stockholders to influence matters requiring stockholder approval will be limited. As of March 14, 2022, BD1 beneficially owned 15,933,334 shares of our common stock, Crowdex beneficially owned 5,545,042 shares of our common stock, and TubeSolar beneficially owned 4,961,234 shares of our common stock. As of March 14, 2022, the Company had approximately 30,586,804 shares of common stock outstanding. Accordingly, BD1, Crowdex, and TubeSolar together would be able to cast approximately 86.4% of the votes entitled to vote at any meeting of stockholders of the Company (or written consent of stockholders in lieu of meeting). BD1, Crowdex, and TubeSolar, therefore, will, for the foreseeable future, have significant influence over our management and affairs, and will be able to control virtually all matters requiring stockholder approval, including the election of directors and significant corporate transactions such as mergers or sales of our Company or assets. On September 15, 2021, the Company entered into the JDA with TubeSolar. See "Item 1 Business" for additional detail.

The interests of our three largest stockholders may conflict with our interests or your interests now or in the future. Three of our stockholders, Crowdex, TubeSolar and BD1, collectively beneficially own approximately 86.4% of our Company's common stock.

Crowdex is an investment holding company 100% directly and indirectly beneficially owned by Bernd Förtsch. One of our directors, David Peterson, is the manager of Crowdex and a cousin of Michael J. Gilbreth, the Company's Chief Financial Officer.

TubeSolar is a developer of photovoltaic thin-film tubes to enable additional application opportunities in solar power generation compared to conventional solar modules. TubeSolar is a public company headquartered in Augsburg, Germany, whose shares are listed on XETRA (primary market Dusseldorf, Germany). Bernd Förtsch directly and indirectly owns a controlling interest in TubeSolar. On September 15, 2021, the Company entered into the JDA with TubeSolar. See "Item 1 Business" for additional detail.

BD1 is an investment holding company. BD1 is 100% owned by BD Vermögensverwaltung GmbH. BD Vermögensverwaltung GmbH is 100% owned by Solar Invest International SE. Johannes Kuhn and Ute Kuhn are the beneficial owners and members of the board of directors of Solar Invest International SE. BD Vermögensverwaltung GmbH and Solar Invest International SE together own approximately 18.9% of TubeSolar's shares.

Various conflicts of interest between us and our controlling stockholders could arise. The ownership interest and voting power of our controlling stockholders could create or appear to create potential conflicts of interest when such controlling stockholders are faced with decisions relating to us. We may not be able to resolve any potential conflicts, and even if we do, the resolution may be less favorable to us than if we were dealing with an unaffiliated third party.

So long as Crowdex, TubeSolar and BD1 continue to beneficially own a significant amount of our outstanding equity securities, those stockholders may be able to strongly influence or effectively control our decisions.

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

The price of our common stock may continue to be volatile. Our common stock is currently traded on the OTC Markets. 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 most of the calendar year ended December 31, 2020, our common stock traded at or below \$1.00 and in 2021, our common stock ranged from \$10.00 to \$485.00, all prices as adjusted for the reverse stock split. 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.

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 OTC Markets. 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 OTC Markets 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 Securities Exchange Act of 1934, as amended (“Exchange Act”). A lack of investor confidence in the reliability and accuracy of our public reporting could cause our stock price to decline.

Our stockholders may experience significant dilution as a result of new securities that we may issue in the future. We may issue additional common stock or securities convertible into or exchangeable or exercisable for common stock, in connection with future capital raising transactions. 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 previously 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 OTC Markets.

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 OTC Markets 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 Certificate of Incorporation and 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

Our principal business office and manufacturing facility is located in a leased space at 12300 Grant Street, Thornton, Colorado 80241. We have approximately 30,000 square feet of fully equipped office space and 70,000 square feet of fully equipped manufacturing space. We consider our office space adequate for our current operations.

Item 3. Legal Proceedings

Details of the Company’s legal proceedings are included in Note 17 to the consolidated financial statements within Item 8 of this Annual Report on Form 10-K.

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 OTC Markets. Our trading symbol is "ASTI."

Holders

As of December 31, 2021, the number of record holders of our common stock was 25. 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, 2021 and 2020, 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.

Recent Sales of Unregistered Securities

During the year ended December 31, 2021, all sales of unregistered securities by the Company have been previously reported on a Form 8-K or Form 10-Q.

Issuer Purchases of Equity Securities

We did not repurchase any of our equity securities during the period covered by this Annual Report.

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 contain 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, 2021 we generated \$607,783 of revenue. Product sales accounted for 100% of total revenue. As of December 31, 2021, we had an accumulated deficit of approximately \$427,782,788.

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 no longer produces or sells Enerplex-branded consumer products. 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. In 2019, Ascent completed a repeat order from the same customer who had since established its airship development operation in the US. In 2020, we received a third and enlarged order from the same customer and completed the order in the second quarter of 2021. Most recently, in the 4th quarter of 2021 we received a fourth order with a targeted ship date in the 2nd quarter of 2022.

We continue to design and manufacture PV integrated 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 extensive.

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.

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;
- The substantial doubt about our ability to continue as a going concern due to our history of operating losses;
- 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 OTC Markets;
- Our ability to maintain effective internal controls over financial reporting;
- Our ability to achieve projected operational performance and cost metrics;
- Our ability to enter into commercially viable licensing, joint venture, or other commercial arrangements;
- Availability of raw materials; and
- COVID-19 and the uncertainty around the continued duration and effect of the worldwide pandemic.

Basis of Presentation: The discussion and analysis of our financial condition and results of operations are based on our consolidated financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States (“US GAAP” or “GAAP”). The preparation of these consolidated financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses, and related disclosure of contingent assets and liabilities. On an ongoing basis, we evaluate our estimates based on historical experience and on various other assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions. We have identified the policies below as critical to our business operations and to the understanding of our financial results:

Significant Accounting Policies

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. If actual demand and market conditions are less favorable than those estimated by management, additional inventory write downs may be required.

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.

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 11 for further discussion on the embedded derivatives of each instrument.

Paycheck Protection Program Loan: The Company has elected to account for the forgivable loan received under the Paycheck Protection Program ("PPP") provisions of the Coronavirus Aid, Relief, and Economic Security ("CARES") Act as a debt instrument and to accrue interest on the outstanding loan balance. Additional interest at a market rate (due to the stated interest rate of the PPP loan being below market) is not imputed, as the transactions where interest rates prescribed by governmental agencies are excluded from the scope of accounting guidance on imputing interest. The proceeds from the loan will remain recorded as a liability until either (1) the loan is, in part or wholly, forgiven and the Company has been legally released or (2) the Company repays the loan to the lender. On September 4, 2021, the Company received notification from Vectra that the Small Business Administration has forgiven the PPP loan and the liability was recognized as other income.

Revenue Recognition:

Product revenue. We recognize revenue for the sale of PV modules 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.

Milestone revenue. Each milestone arrangement is a separate performance obligation. The transaction price is estimated using the most likely amount method and revenue is recognized as the performance obligation is satisfied through achieving manufacturing or cost targets and engineering targets.

Government contract 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.

Research, Development and Manufacturing Operations Costs: 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.

Recently Issued Accounting Standards

In August 2020, the FASB issued ASU No. 2020-06, *Debt - Debt with Conversion and Other Options (Subtopic 470-20) and Derivatives and Hedging Contracts in Entity's Own Equity (Subtopic 815-40): Accounting for Convertible Instruments and Contracts in an Entity's Own Equity*. ASU 2020-06 will simplify the accounting for convertible instruments by reducing the number of accounting models for convertible debt instruments and convertible preferred stock. Limiting the accounting models results in fewer embedded conversion features being separately recognized from the host contract as compared with current GAAP. Convertible instruments that continue to be subject to separation models are (1) those with embedded conversion features that are not clearly and closely related to the host contract, that meet the definition of a derivative, and that do not qualify for a scope exception from derivative accounting and (2) convertible debt instruments issued with substantial premiums for which the premiums are recorded as paid-in capital. ASU 2020-06 also amends the guidance for the derivatives scope exception for contracts in an entity's own equity to reduce form-over-substance-based accounting conclusions. ASU 2020-06 will be effective for public companies that are smaller reporting companies for fiscal years beginning after December 15, 2023, including interim periods within those fiscal years. Early adoption is permitted, but no earlier than fiscal years beginning after December 15, 2020, including interim periods within those fiscal years. Management has not yet evaluated the impact that the adoption of ASU 2020-06 will have on the Company's consolidated financial statement presentation or disclosures.

Other new pronouncements issued but not effective as of December 31, 2021 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, 2021 and 2020

	Year Ended December 31,		
	2021	2020	\$ Change
Revenues			
Product Revenue	607,783	66,613	541,170
Total Revenues	607,783	66,613	541,170
Costs and Expenses			
Cost of Revenue	1,902,414	174,588	1,727,826
Research, development and manufacturing operations	4,140,319	1,165,193	2,975,126
SG&A	3,297,982	1,029,720	2,268,262
Depreciation	57,314	151,658	(94,344)
Total Costs and Expenses	9,398,029	2,521,159	6,876,870
Loss From Operations	(8,790,246)	(2,454,546)	(6,335,700)
Other Income/(Expense)			
Other Income/(Expense), net	(169,423)	3,002,170	(3,171,593)
Interest Expense	(1,088,327)	(3,507,533)	2,419,206
Change in fair value of derivatives and gain on extinguishment of liabilities	4,047,993	4,577,353	(529,360)
Total Other Income	2,790,243	4,071,990	(1,281,747)
Net Income/(Loss)	(6,000,003)	1,617,444	(7,617,447)

Revenues. Our revenues increased by \$541,170, or 812%, for the year ended December 31, 2021 when compared to the same period in 2020. The increase in sales is due primarily increased operations in the current year. During 2020, the Company was in a dormant status for the most part of the year as the focus in 2020 was to recapitalize and restructure the Company's balance sheet. The intensification of the COVID-19 pandemic since March 2020 also significantly impacted our restructuring effort, thereby delaying our ability to restart our operations in a timely manner.

Cost of revenues. Cost of revenues is comprised primarily of repair and maintenance, direct labor and overhead expenses. Our cost of revenues increased by \$1,727,826, or 990%, for the year ended December 31, 2021 when compared to the same period in 2020. The increase in cost of revenues is mainly due to the increase in repair and maintenance, materials, and labor costs as a result of increased production and restarting equipment for the year ended December 31, 2021 compared to 2020. 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.

Research, development and manufacturing operations. 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. Research, development and manufacturing operations costs increased by \$2,975,126 or 255%, for the year ended December 31, 2021 when compared to the same period in 2020. The increase in cost is due primarily to increased operations in the current year as compared to the Company's dormant status in the prior year.

Selling, general and administrative. Selling, general and administrative expenses increased by \$2,268,262, or 220%, for the year ended December 31, 2021 when compared to the same period in 2020. The increase in costs is due primarily to an increased level of operations in the current period as compared to the Company's dormant status in 2020.

Other Income. Other income decreased by \$1,281,747 or 31%, for the year ended December 31, 2021 when compared to the same period in 2020. In 2020, the Company recognized approximately \$3 million gain on the sale of our facility with no similar transaction in the current year. This is partially offset by the decrease in interest expense in the current year as the Company restructured its debt in late 2020.

Net Income/(Loss). Our Net Loss was \$6,000,003 for the year ended December 31, 2021, compared to Net Income of \$1,617,444 for the year ended December 31, 2020, a reduction of \$7,617,447. The reduction is due to the reasons described above.

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, 2021 the Company used \$9,404,443 in cash for operations.

Additional projected product revenues are not anticipated to result in a positive cash flow position for the year 2022 overall and, as of December 31, 2021, the Company has working capital of \$3,799,806; however additional financing will be required for us to reach a level of sufficient sales to achieve profitability.

The Company continues to accelerate sales and marketing efforts related to its military solar products and specialty PV application strategies through expansion of its sales and distribution channels. The Company continues activities to secure 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, 2021 and 2020

For the year ended December 31, 2021, our cash used in operations was \$9,404,443 compared to \$2,884,919 for the year ended December 31, 2020, an increase of \$6,519,524. The increase is primarily the result of scaling up operations during 2021 as compared to the Company's dormant status for most of 2020. For the year ended December 31, 2021, cash used in investing activities was \$301,522 compared to cash provided by investing activities of \$254,444 for the year ended December 31, 2020. This change was primarily the result of a decrease in proceeds from the sale of assets. During the year ended December 31, 2021, negative operating cash flows of \$9,404,443 were primarily funded through \$15,500,000 in proceeds from issuances of preferred and common stock.

Off Balance Sheet Transactions

As of December 31, 2021, 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, 2021.

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, 2021, 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.

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, 2021. Based on this evaluation, our management concluded the design and operation of our disclosure controls and procedures were effective as of December 31, 2021.

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 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 engaged an independent third party firm and 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 effective as of December 31, 2021. 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 2020

As disclosed in Item 9A, "Controls and Procedures," of the Company's Annual Report on Form 10-K for the year ended December 31, 2020, management concluded that a material weakness existed in its internal control over financial reporting as it related to the lack of accounting resourcing with technical expertise to ensure that all Company transactions were accounted for in accordance with US GAAP. Specifically, the Company's controls to ensure that appropriate accounting for the Company's inventory and cost of revenue and the Company's accounting for complex debt and equity securities transactions were not designed at a sufficient level of precision to mitigate the risk of material misstatement.

Remediation of Material Weaknesses in Internal Control over Financial Reporting

The Company's financial challenges faced in 2020 subsided as cash flows improved during the year ended December 31, 2020 and began to bring the Company into operating status. The Company executed the following steps to remediate the aforementioned material weakness in its internal controls over financial reporting:

- The Company hired a new Chief Financial Officer during the fourth quarter of 2020 and a new Controller with a strong financial statement audit and technical accounting background during the second quarter of 2021. The Company's Controller, acting in coordination with the Company's CFO, were both highly involved in implementing and monitoring internal controls over the Company's quarterly financial reporting including the oversight of controls specifically related to the Company's inventory activities, cost of revenue allocations, and accounting for the Company's debt and equity securities, supervising the accounting staff involved in the Company's quarterly financial reporting, and identifying, monitoring, and resolving accounting issues as raised throughout the Company's ongoing activities.
- The Company significantly reduced the complexity of the debt structure through consolidation and simplifying of terms thereby lowering the associated administration and cost burden.
- The Company engaged an external resource with the technical expertise to assist in documenting and testing internal controls under Section 302 and 404 of the Sarbanes Oxley Act of 2002.

The substantial elimination of the complexities in the Company's debt and securities accounting along with the above changes in internal controls over financial reporting during the year ended December 31, 2021, have materially improved the Company's internal control over financial reporting, and have effectively remediated the Company's prior material weaknesses as previously disclosed above.

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, 2021 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

None.

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections

Not applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

EXECUTIVE OFFICERS AND DIRECTORS

Our executive officers, continuing directors and director nominees, their ages and positions with us as of March 14, 2022, are as follows:

Name	Age	Position
Victor Lee	54	President and Chief Executive Officer, Director
Michael J. Gilbreth	45	Chief Financial Officer
Amit Kumar, Ph.D.	57	Chairman of the Board, Director
David Peterson	52	Director
Kim J. Huntley	67	Director
Will A. Clarke	54	Director

Victor Lee (Lee Kong Hian) has been the President and Chief Executive Officer of Ascent Solar Technologies Inc. since February 1, 2012 and a member of our Board since November 2011. Mr. Lee joined HF Foods Group Inc. (NASDAQ:HFFG) as Vice President, Chief Corporate Finance and Strategy Officer in December 2019 and was promoted to Executive Vice President and Chief Financial Officer in May 2020. He brings more than 25 years of experience in strategic planning, sales & marketing, corporate finance, real estate finance and investment management, and corporate advisory services at leading worldwide financial institutions. Mr. Lee began his career at Citibank N.A., in 1993, handling small-and medium-sized corporate finance and progressed to a vice president position in the International Personal Banking Division. In 1999 he moved to Deutsche Bank AG as Vice President and in 2004 was promoted to managing director Singapore Market Head in the Private Wealth Management Division, where he was responsible for management of approximately \$1 Billion in assets. From 2007 until 2009, he was with Morgan Stanley Private Wealth Management, most recently as executive director and head of Singapore/Malaysia markets. Mr. Lee holds a Bachelor's degree in Accounting from the University of Wisconsin and a Master's in Wealth Management from the Singapore Management University. We believe Mr. Lee is well-qualified to serve as a director due to his business experience and his comprehensive knowledge of the Company.

Michael J. Gilbreth has been Chief Financial Officer of Ascent Solar Technologies Inc. since October 2020. Mr. Gilbreth is a financial executive with more than 15 years of experience in accounting and business management, consumer packaged goods, e-commerce, and financial consulting. In April 2020, Mr. Gilbreth formed a financial consulting company, PVMG Advisors, Inc., which provides financial and business consulting services. While at PVMG, Mr. Gilbreth provided consulting services to Crowdex Investment, LLC in connection with the Company's recent restructuring and recapitalization process. Previously, from 2015 to January 2020, Mr. Gilbreth was Vice President of Finance at Candy Club Holding Limited (ASX: CLB) headquartered in Los Angeles, California. Candy Club is a leading specialty market confectionery company which operates in the business-to-business (B2B) and business-to-customer (B2C) segments in the United States. In this lead finance role at Candy Club, Mr. Gilbreth supported the company's capital raising activities, including a successful initial public offering on the Australian Stock Exchange (ASX) in February 2019. From 2013 to 2015, Mr. Gilbreth operated Gilbreth Consulting, which provides financial and operational management consulting services, and strategic and operational planning services. From 2010 to 2013, Mr. Gilbreth was VP/Finance at MediaTrust, a performance marketing company based in southern California. From 2005 to 2010, Mr. Gilbreth was a business manager at Duban Sattler and Associates LLP, a boutique tax accounting and business management firm based in southern California which represents high net worth individuals. Mr. Gilbreth holds a Bachelor's degree in Business Administration from California State University, Chico. Mr. Gilbreth and David Peterson are cousins.

Amit Kumar, Ph.D. has served on our Board since June 2007 and as Chairman since January 2011. Dr. Kumar is currently Chairman, President and CEO of Anixa Biosciences (NASDAQ:ANIX), a publicly held biotechnology company. From December 2010 to June 2015, Dr. Kumar was President and CEO of Geo Fossil Fuels, a privately held energy company. From September 2001 until June 30, 2010, Dr. Kumar was President and CEO of CombiMatrix Corporation (NASDAQ: CBMX). Previously, Dr. Kumar was Vice President of Life Sciences of Acacia Research Corp (NASDAQ: ACTG). From January 1999 to February 2000, Dr. Kumar was the founding President and Chief Executive Officer of Signature BioSciences, Inc., a life science company developing technology for advanced research in genomics, proteomics and drug discovery. From January 1998 to December 1999, Dr. Kumar was an Entrepreneur in Residence with Oak Investment Partners, a venture capital firm. From October 1996 to January 1998, Dr. Kumar was a Senior Manager at IDEXX Laboratories, Inc., a biotechnology company.

From October 1993 to September 1996, Dr. Kumar was Head of Research & Development for Idetek Corporation, which was later acquired by IDEXX Laboratories, Inc. Dr. Kumar received his B.S. degree in chemistry from Occidental College. After joint studies at Stanford University and the California Institute of Technology, he received his Ph.D. in Chemistry from Caltech in 1991. He also completed a post-doctoral fellowship at Harvard University in 1993. Dr. Kumar has authored and co-authored over 40 peer-reviewed publications and holds a dozen patents. Dr. Kumar brings significant leadership experience as well as experience in photovoltaic research including work on energy conversion using cells made from silicon (single crystal, polycrystalline, and amorphous), gallium arsenide, indium phosphide, metal oxides and other materials. Dr. Kumar is a member of the board of directors of Actym Therapeutics, a private biotechnology company. We believe Mr. Kumar is well-qualified to serve as a director due to his experience as a director and executive of several public and private companies.

Kim J. Huntley has served on our Board since June 2010. Mr. Huntley served in the Defense Logistics Agency (DLA) of the U.S. Department of Defense (DOD) for more than 32 years in positions of increasing responsibility. Most recently, from July 2008 until his retirement in January 2010, Mr. Huntley served as Director of the Defense Energy Support Center (DESC) in Fort Belvoir, Virginia. The DESC operates as part of the DLA and is responsible for providing energy solutions to the DOD and federal civilian agencies. As Director of the DESC, Mr. Huntley was the principal executive officer in charge of approximately 1,100 employees worldwide and over \$25 billion in annual appropriations involving energy infrastructure and products. From March 2006 and immediately prior to becoming Director of the DESC, Mr. Huntley served in leadership roles involving supply chain management, including Deputy Commander for the Defense Supply Center in Richmond, Virginia and Columbus, Ohio, and as Executive Director of Customer Support and Readiness. From December 2003 to March 2006, Mr. Huntley served as Chief of the Customer Support Office in Fort Belvoir, Virginia. Mr. Huntley chaired the Inter Agency Working Group for Alternative Fuels and Renewable Energy from January 2009 to January 2010. The Group included senior energy representatives from DOD, DOE, EPA, and other major Federal Agencies. Mr. Huntley holds a B.A. degree in Economics from Golden Gate University and attended post-graduate courses in economics at California State University, Hayward. Mr. Huntley brings extensive supply chain, budget and defense industry experience to our Board. We believe Mr. Huntley is well-qualified to serve as a director due to his extensive experience in the public sector.

David Peterson has served on our Board since December 2020. Mr. Peterson has over 25 years of business management experience, including 8 years as a private equity investor, 5 years as a manager at an engineering consulting firm, and over 20 years of board experience. From April 2015 to present, Mr. Peterson has worked for EPD Consultants, Inc., a privately held engineering firm headquartered in Carson, California, where he serves as Senior Project Manager. From 2010 to 2015, Mr. Peterson was President and Co-Founder of Great Circle Industries, Inc., a water recycling company in southern California. His past experience includes being a board member at AIR-serv, LLC, a tire inflation vending machine manufacturer, where Mr. Peterson managed the acquisition process, including obtaining expansion of the company's credit facility, as that company completed 10 acquisitions and grew from \$10 million of EBITDA to \$20 million of EBITDA in the year prior to its sale for \$151 million to WindPoint Partners. Mr. Peterson has an MBA degree from the Marshall School of Business at the University of Southern California, and a B.A. from the University of California, Santa Cruz. Mr. Peterson is currently the Manager of Crowdex Investment, LLC, a significant equity investor in the Company. Mr. Peterson and Michael J. Gilbreth are cousins. We believe Mr. Peterson is well-qualified to serve as a director due to his extensive management and board experience.

Will A. Clarke has served on our Board since December 2020. Since 2020, Mr. Clarke has been the Founder and President of Clarke Growth and Sustainment Strategies, an advisory firm specializing in guiding startup and early stage companies' business expansion. From 2018 to 2020, Mr. Clarke was Head of Global Supply Chain Management and Technical Procurement for Atlas Airlines Worldwide Holdings, Inc. (NASDAQ: AAWW), a leading global provider of outsourced aircraft and aviation operating services headquartered in Purchase, NY. From 2015 to 2017, Mr. Clarke was Director of Procurement at Best Buy Co., Inc. (NYSE: BBY), a provider of technology products, services and solutions to its customers through over 1,400 retail stores, and also through its websites and mobile applications. Best Buy is headquartered in Richfield, MN and has operations in the United States, Canada and Mexico. Prior to launching his second career in 2015, Mr. Clarke served 25 years as an Officer in the U.S. Navy, where he completed 10 deployments in support of war and peacetime operations on two aircraft carriers, one submarine, one warship and one on land. Mr. Clarke served in a number of senior finance, supply chain, procurement and logistics assignments across East Africa, Asia/Pacific, and the United States while serving in the U.S. Navy, where he attained the rank of Captain (O6). Mr. Clarke earned a B.S. in Mathematics from the U.S. Naval Academy, an M.S. in Finance and Contracts Management from the Naval Postgraduate School and has completed the Executive Development Program at Wharton Business School and the Corporate Governance Program at Columbia Business School. We believe Mr. Clarke is well-qualified to serve as a director due to his knowledge and business experience.

Section 16(a) Beneficial Ownership Reporting Compliance

Section 16(a) of the Exchange Act requires our directors, executive officers, and persons holding more than 10% of our common stock to report their initial ownership of the common stock and other equity securities and any changes in that ownership in reports that must be filed with the SEC. The SEC has designated specific deadlines for these reports, and we must identify in our Annual Report on Form 10-K those persons who did not file these reports when due.

Based solely on a review of reports furnished to us, or written representations from reporting persons, we believe all directors, executive officers, and 10% owners timely filed all reports regarding transactions in our securities required to be filed in 2020 or 2021 by Section 16(a) under the Exchange Act, except that (i) Mr. Gilbreth and Crowdex each filed a late Form 3 in 2020, (ii) TubeSolar filed a late Form 3 in 2021, and (iii) BD1 and TubeSolar each filed one late Form 4 in 2021.

Overview

Our Bylaws provide that the size of our Board of Directors is to be determined from time to time by resolution of the Board of Directors, but shall consist of at least two and no more than nine members. Our Board of Directors currently consists of five members. The Board has determined that the following directors are “independent” as required by the listing standards of the OTC Markets and by our corporate governance guidelines: Dr. Kumar, Mr. Huntley and Mr. Clarke.

Our Certificate of Incorporation provides that the Board of Directors will be divided into three classes. Our Class 1 director is Dr. Amit Kumar. Our Class 2 directors are Kim J. Huntley and Will A. Clarke. Our Class 3 directors are David Peterson and Victor Lee.

Board Leadership Structure and Role in Risk Oversight

We currently separate the roles of Chairman of the Board and Chief Executive Officer. We believe that Dr. Kumar possesses the strategic, technical and industry knowledge and expertise to serve as our Chairman. As President and Chief Executive Officer, Mr. Lee is responsible for day-to-day oversight of our operations and personnel. Notwithstanding the foregoing, our Board does not have a formal policy regarding separation of the Chairman and Chief Executive Officer roles, and the Board may in the future decide to implement such a policy if it deems it in the best interests of us and our stockholders. The Board does not have a lead independent director.

Risk is inherent with every business, and how well a business manages risk can ultimately determine its success. We face a number of risks, including credit risk, interest rate risk, liquidity risk, operational risk, strategic risk and reputation risk. Management is responsible for the day-to-day management of risks we face, while the Board, as a whole and through its committees, has responsibility for the oversight of risk management. In its risk oversight role, the Board of Directors has the responsibility to satisfy itself that the risk management processes designed and implemented by management are adequate and functioning as designed. To do this, the Chairman of the Board meets regularly with management to discuss strategy and the risks we face. In addition, the Audit Committee regularly monitors our enterprise risk, including financial risks, through reports from management. Senior management attends the Board meetings and is available to address any questions or concerns raised by the Board on risk management and any other matters. The Chairman of the Board and independent members of the Board work together to provide strong, independent oversight of our management and affairs through the Board’s standing committees and, when necessary, executive sessions of the independent directors.

Committees of the Board of Directors

Our Board has three standing committees: an Audit Committee, a Compensation Committee, and a Nominating and Governance Committee. Each committee operates pursuant to a charter. The charters of the Audit Committee, the Compensation Committee, and the Nominating and Governance Committee can be found on our website www.ascentsolar.com.

Audit Committee. Our Audit Committee oversees our accounting and financial reporting processes, internal systems of accounting and financial controls, relationships with independent auditors, and audits of financial statements. Specific responsibilities include the following:

- selecting, hiring and terminating our independent auditors;
- evaluating the qualifications, independence and performance of our independent auditors;
- approving the audit and non-audit services to be performed by our independent auditors;
- reviewing the design, implementation, adequacy and effectiveness of our internal controls and critical accounting policies;
- reviewing and monitoring the enterprise risk management process;
- overseeing and monitoring the integrity of our financial statements and our compliance with legal and regulatory requirements as they relate to financial statements or accounting matters;

- reviewing, with management and our independent auditors, any earnings announcements and other public announcements regarding our results of operations; and
- preparing the report that the SEC requires in our annual proxy statement.

Our Audit Committee is comprised of Mr. Huntley, Dr. Kumar and Mr. Clarke. Mr. Huntley serves as Chairman of the Audit Committee. The Board has determined that all members of the Audit Committee are independent under the rules of the OTC Markets, and that Mr. Huntley qualifies as an “audit committee financial expert,” as defined by the rules of the SEC.

Compensation Committee. Our Compensation Committee assists our Board in determining the development plans and compensation of our officers, directors and employees. Specific responsibilities include the following:

- approving the compensation and benefits of our executive officers;
- reviewing the performance objectives and actual performance of our officers; and
- administering our stock option and other equity compensation plans.

The Compensation Committee reviews all components of compensation including base salary, bonus, equity compensation, benefits and other perquisites. In addition to reviewing competitive market values, the Compensation Committee also examines the total compensation mix, pay-for-performance relationship and how all elements, in the aggregate, comprise the executives’ total compensation package. The CEO makes recommendations to the Compensation Committee from time to time regarding the appropriate mix and level of compensation for other officers. Those recommendations consider the objectives of our compensation philosophy and the range of compensation programs authorized by the Compensation Committee. The Compensation Committee may determine director compensation by reviewing peer group data. Although the Compensation Committee has the authority to retain outside third parties, it does not currently utilize any outside consultants. The Compensation Committee may delegate certain of its responsibilities, as it deems appropriate, to other committees or officers.

Our Compensation Committee is comprised of Mr. Clarke, Mr. Huntley and Dr. Kumar. Mr. Clarke serves as Chairman of the Compensation Committee.

Our Board has determined that all members of the Compensation Committee are independent under the rules of the Nasdaq Capital Market and OTC Markets.

Nominating and Governance Committee. Our Nominating and Governance Committee assists our Board by identifying and recommending individuals qualified to become members of our Board, reviewing correspondence from our stockholders, and establishing, evaluating and overseeing our corporate governance guidelines. Specific responsibilities include the following:

- evaluating the composition, size and governance of our Board and its committees and making recommendations regarding future planning and the appointment of directors to our committees;
- establishing a policy for considering stockholder nominees for election to our Board; and
- evaluating and recommending candidates for election to our Board.

Our Nominating and Governance Committee is comprised of Dr. Kumar, Mr. Huntley, and Mr. Clarke. Dr. Kumar serves as Chairman of our Nominating and Governance Committee. Our Board has determined that all members of the Nominating and Governance Committee are independent under the rules of Nasdaq Capital Market and OTC Markets.

When considering potential director candidates for nomination or election, the following characteristics are considered in accordance with our Nominating and Governance Committee Charter:

- high standard of personal and professional ethics, integrity and values;
- training, experience and ability at making and overseeing policy in business, government and/or education sectors;
- willingness and ability to keep an open mind when considering matters affecting interests of us and our constituents;

- willingness and ability to devote the time and effort required to effectively fulfill the duties and responsibilities related to the Board and its committees;
- willingness and ability to serve on the Board for multiple terms, if nominated and elected, to enable development of a deeper understanding of our business affairs;
- willingness not to engage in activities or interests that may create a conflict of interest with a director's responsibilities and duties to us and our constituents; and
- willingness to act in the best interests of us and our constituents, and objectively assess Board, committee and management performances.

In addition, in order to maintain an effective mix of skills and backgrounds among the members of our Board, the following characteristics also may be considered when filling vacancies or identifying candidates:

- diversity (e.g., age, geography, professional, other);
- professional experience;
- industry knowledge (e.g., relevant industry or trade association participation);
- skills and expertise (e.g., accounting or financial);
- leadership qualities;
- public company board and committee experience;
- non-business-related activities and experience (e.g., academic, civic, public interest);
- continuity (including succession planning);
- size of the Board;
- number and type of committees, and committee sizes; and
- legal and other applicable requirements and recommendations, and other corporate governance-related guidance regarding Board and committee composition.

The Nominating and Governance Committee will consider candidates recommended by stockholders who follow the nomination procedures in our bylaws. The Nominating and Governance Committee does not have a formal policy with respect to diversity; however, as noted above, the Board and the Nominating and Governance Committee believe that it is essential that Board members represent diverse viewpoints.

Number of Meetings

The Board held a total of six meetings in 2021. Our Audit Committee held ten meetings, our Compensation Committee held five meetings, and our Nominating and Governance Committee held four meetings in 2021. Each director attended at least 75% of the aggregate of the total number of meetings of the Board and the Board committees on which he served.

Board Member Attendance at Annual Stockholder Meetings

Although we do not have a formal policy regarding director attendance at annual stockholder meetings, directors are encouraged to attend these annual meetings absent extenuating circumstances. We did not hold our annual meeting during 2021 or 2020.

Stockholder Nominations

In accordance with our Bylaws, a stockholder wishing to nominate a director for election at an annual or special meeting of stockholders must timely submit a written proposal of nomination to us at our executive offices. To be timely, a written proposal of nomination for an annual meeting of stockholders must be received at least 90 calendar days but no more than 120 calendar days before the first anniversary of the date on which we held our annual meeting of stockholders in the immediately preceding year; *provided, however*, that in the event that the date of the annual meeting is advanced or delayed more than 30

calendar days from the anniversary of the annual meeting of stockholders in the immediately preceding year, the written proposal must be received: (i) at least 90 calendar days but no more than 120 calendar days prior to the date of the annual meeting; or (ii) no more than 10 days after the date we first publicly announce the date of the annual meeting. A written proposal of nomination for a special meeting of stockholders must be received no earlier than 120 calendar days prior to the date of the special meeting nor any later than the later of: (i) 90 calendar days prior to the date of the special meeting; and (ii) 10 days after the date we first publicly announce the date of the special meeting.

Each written proposal for a nominee must contain: (i) the name, age, business address and telephone number, and residence address and telephone number of the nominee; (ii) the current principal occupation or employment of each nominee, and the principal occupation or employment of each nominee for the prior ten (10) years; (iii) a complete list of companies, whether publicly traded or privately held, on which the nominee serves (or, during any of the prior ten (10) years, has served) as a member of the board of directors; (iv) the number of shares of our common stock that are owned of record and beneficially by each nominee; (v) a statement whether the nominee, if elected, intends to tender, promptly following such person's failure to receive the required vote for election or reelection at the next meeting at which the nominee would face election or reelection, an irrevocable resignation effective upon acceptance of such resignation by the Board; (vi) a completed and signed questionnaire, representation and agreement relating to voting agreements or commitments to which the nominee is a party; (vii) other information concerning the nominee that would be required in a proxy statement soliciting the nominee's election; and (viii) information about, and representations from, the stockholder making the nomination.

A stockholder interested in submitting a nominee for election to the Board of Directors should refer to our Bylaws for additional requirements. Upon receipt of a written proposal of nomination meeting these requirements, the Nominating and Governance Committee of the Board will evaluate the nominee in accordance with its charter and the characteristics listed above.

Director Compensation

In March and June 2021, our board of directors approved the following annual independent director compensation program:

Independent Director Compensation Policy	
Annual Board Retainers	
Board Member	\$ 20,000
Chairman of the Board	\$ 10,000
Annual Committee Chair Retainer	
Audit	\$ 70,000
Compensation	\$ 20,000
Nominating and Corporate Governance	\$ 20,000

Each annual cash retainer is paid quarterly in arrears. There are currently no equity grants for service on the board of directors. We do not provide any perquisites to directors but will reimburse all directors for expenses incurred in physically attending meetings or performing their duties as directors.

The following Director Compensation Table summarizes the compensation of each of our non-employee directors for services rendered to us during the year ended December 31, 2021:

2021 Director Compensation Table

Name	Fees Earned or Paid in Cash (\$)	Stock Awards (\$)(1)	Option Awards (\$)(1)	All Other Compensation (\$)	Total (\$)
Amit Kumar	50,000	-	-	-	50,000
Kim J. Huntley (2)	77,500	-	-	-	77,500
Will A. Clarke	40,000	-	-	-	40,000
David Peterson (3)	-	-	-	-	-
Victor Lee (3)	-	-	-	-	-

(1) None.

- (2) The Company increased the annual retainer for the Audit Committee Chair to \$70,000 for the 2021 fiscal year for the additional time burden relating to SEC filings and remediation efforts for the Company's material weakness in financial controls and procedures.
- (3) Non-independent directors do not receive compensation for their board service.

In addition to the fees listed above, we reimburse the directors for travel expenses submitted to us related to their attendance at meetings of the Board or its committees. The directors did not receive any other compensation or personal benefits.

Code of Ethics

We have adopted a code of ethics that applies to our principal executive officer, principal financial officer, principal accounting officer and other senior finance and accounting staff. The code is designed to, among other things, deter wrongdoing and to promote the honest and ethical conduct of our officers and employees. The text of our code of ethics can be found on our Internet website at www.ascentsolar.com. If we effect an amendment to, or waiver from, a provision of our code of ethics, we intend to satisfy our disclosure requirements by posting a description of such amendment or waiver on that Internet website or via a current report on Form 8-K.

Communication with the Board of Directors

Stockholders may communicate with the Board by sending correspondence to our Chairman, c/o the Corporate Secretary, at our corporate address on the cover of this Form 10-K. It is our practice to forward all such correspondence to our Chairman, who is responsible for determining whether to relay the correspondence to the other members of the Board.

Item 11. Executive Compensation

We have opted to comply with the executive compensation disclosure rules applicable to "smaller reporting companies," as such term is defined in the rules promulgated under the Securities Act.

This section provides an overview of the compensation awarded to, earned by, or paid to each individual who served as our principal executive officer during 2021, and up to two of our next most highly compensated executive officers in respect of their service to our Company for 2021. Our named executive officers, or the Named Executive Officers, for the year ended December 31, 2021, are:

- Victor Lee, our CEO; and
- Michael J. Gilbreth, our CFO.

The following Summary Compensation Table sets forth certain information regarding the compensation of our Named Executive Officers for services rendered in all capacities to us during the years ended December 31, 2021 and 2020.

Summary Compensation Table

Name and Principal Position	Year	Salary (\$)	Bonus (\$)	Stock Awards (\$)	Option Awards (\$)	All Other Comp (\$)	Total (\$)
Victor Lee - Chief Executive Officer (1)	2021	165,000	200,000	-	-	-	365,000
	2020	96,903	-	-	-	-	96,903
Michael J. Gilbreth - Chief Financial Officer (2)	2021	165,000	74,250	-	-	-	239,250
	2020	37,706	-	-	-	-	37,706

- (1) Mr. Lee's employment agreement provides for a minimum annual salary of \$300,000, which salary was increased to \$330,000 in 2016. Due to liquidity constraints, Mr. Lee agreed to limit his salary for 2020 and 2021 to the amounts shown in the summary compensation table above. For the 2022 year, Mr. Lee has agreed to an annual salary of \$165,000. In April 2021, the Compensation Committee approved a special bonus to Mr. Lee of \$100,000, and in December 2021, the Compensation Committee approved an additional bonus to Mr. Lee of \$100,000.
- (2) Mr. Gilbreth joined the Company on October 5, 2020. In December 2021, the Compensation Committee approved a bonus to Mr. Gilbreth of \$74,250.

Executive Employment Agreements

On April 4, 2014, we entered into an employment agreement with Mr. Lee. The employment agreement provides that Mr. Lee will receive an annual base salary of \$300,000, subject to annual adjustments as determined by our board. Mr. Lee will also be eligible for an annual bonus of up to 100% of his base salary as determined at the sole discretion of our board or compensation committee. Under this agreement, if the Company terminates Mr. Lee without cause, then subject to his execution of a release of claims, (i) Mr. Lee is entitled to receive twelve months of base salary from the date of termination, and (ii) the initial stock option grant that Mr. Lee received upon commencing employment will remain exercisable for a year following the termination date. The initial stock option grant is currently fully vested, but Mr. Lee was historically entitled to an additional year of vesting under such initial stock option grant upon termination without cause prior to the full vesting of the option. In addition, the employment agreement provides that Mr. Lee is eligible to participate in the Company's standard benefit plans and programs. Under the employment agreement, Mr. Lee is subject to a two year non-compete and non-solicit following termination of employment.

On October 5, 2020, the Company appointed Michael J. Gilbreth to serve as the Chief Financial Officer of the Company. The Company hired Mr. Gilbreth pursuant to the terms of a letter agreement and a standard and customary confidentiality, non-competition, and no-solicitation agreement. The offer letter provides for at-will employment with an annual base salary of \$165,000, and an annual bonus opportunity of up to 60% of base salary. An annual minimum bonus of 25% of base salary is guaranteed, and the additional 35% is discretionary.

The following table sets forth information concerning the outstanding equity awards granted to the named executive officer as of December 31, 2021.

Outstanding Equity Awards at Fiscal Year-End 2021

Name	Option Awards				Stock Awards	
	Number of Securities Underlying Unexercised Options (#)		Option Exercise Price (\$/sh)	Option Expiration Date	Number of Shares or Units of Stock That Have Not Vested	Market Value of Shares or Units of Stock That Have Not Vested
	Exercisable	Unexercisable				
Victor Lee (1)	*	-	*	3/1/2023	-	-
	*	-	*	4/4/2024	-	-
	*	-	*	2/11/2025	-	-
	*	-	*	6/18/2025	-	-
	*	-	*	3/10/2026	-	-

- (1) After giving effect to the January 2022 reverse stock split, each of Mr Lee's outstanding stock options (i) is exercisable for fewer than one share, and (ii) has a per share exercise price in excess of \$6,000,000.

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

Securities Authorized for Issuance under Equity Compensation Plans

None.

SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT

The following table shows information regarding the beneficial ownership of our common stock by our directors, executive officers, former executive officers and greater than 5% beneficial owners as of March 14, 2022.

Beneficial ownership is determined in accordance with the rules of the SEC and generally includes any shares over which a person exercises sole or shared voting or investment power and all shares issuable upon exercise of options or the vesting of restricted stock within 60 days of March 14, 2022. For purposes of calculating the percentage of our common stock beneficially owned, the number of shares of our common stock includes 30,586,804 shares of our common stock outstanding as of March 14, 2022.

Unless otherwise indicated, each of the stockholders listed below has sole voting and investment power with respect to the shares beneficially owned.

The address for each director or Named Executive Officer is c/o Ascent Solar Technologies, Inc., 12300 Grant Street, Thornton, Colorado 80241.

Name of Beneficial Owner	No. of Shares Beneficially Owned	Percentage
5% Stockholders:		
Crowdex Investment, LLC (1)	5,545,042	18.1%
BD 1 Investment Holding, LLC (2)	15,933,334	52.1%
TubeSolar AG (3)	4,961,234	16.2%
Named Executive Officers and Directors:		
Victor Lee	1	*
Michael J. Gilbreth	-	*
Amit Kumar, Ph.D.	1	*
Kim J. Huntley	1	*
Will A. Clarke	-	*
David Peterson (4)	-	*
All directors and executive officers as a group (6 persons)	3	*

* Less than 1.0%

- (1) The address of Crowdex Investment, LLC ("Crowdex") is 1675 South State Street, Suite B, Kent County, Delaware 19901. Bernd Förtsch is the 100% direct and indirect beneficial owner of Crowdex.
- (2) The address of BD 1 Investment Holdings, LLC ("BD1") is 1675 South State Street, Suite B, Kent County, Delaware 19901. Johannes Kuhn and Ute Kuhn are the indirect beneficial owners of BD1.
- (3) The address for TubeSolar AG ("TubeSolar") is Berliner Allee 65, D – 86153 Augsburg, Germany. Bernd Förtsch directly and indirectly owns a controlling interest in TubeSolar. Mr. Förtsch disclaims beneficial ownership over any of the securities owned by TubeSolar.
- (4) Mr. Peterson is the manager of Crowdex. Mr. Peterson disclaims beneficial ownership of any securities owned by Crowdex.

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

RELATED PARTY TRANSACTIONS

Relationship with Crowdex and TubeSolar

Crowdex and TubeSolar are both directly and indirectly beneficially owned and controlled by Bernd Förtsch.

On September 22, 2020, we entered into a securities purchase agreement ("Series 1A SPA") with Crowdex for the private placement of the Company's newly designated Series 1A Convertible Preferred Stock ("Series 1A Preferred Stock"). We sold 2,000 shares of Series 1A Preferred Stock to Crowdex in exchange for \$2,000,000 of gross proceeds at an initial closing under the Series 1A SPA on September 22, 2020.

In November 2020, Crowdex converted 1,200 shares of outstanding Series 1A Preferred Stock into 2,400,000 shares of Common Stock.

On November 27, 2020, we issued to Crowdex a \$500,000 unsecured convertible promissory note in a private placement and received \$500,000 of gross proceeds from the offering. On December 31, 2020, we sold 500 shares of Series 1A Preferred Stock to Crowdex in exchange for the cancellation of the note issued on November 27, 2020. There were no additional cash proceeds from this closing.

Crowdex acquired a \$250,000 aggregate principal amount convertible promissory note of the Company from the original noteholder, Penumbra Solar, Inc., in September 2020. On December 9, 2021, Crowdex converted the note, together with accrued interest, into 545,041 shares of common stock.

On January 4, 2021, the Company entered into a securities purchase agreement with TubeSolar. Pursuant to this securities purchase agreement, the Company sold 2,500 shares of Series 1A Preferred Stock to TubeSolar and received \$2,500,000 of gross proceeds on January 5, 2021. On July 19, 2021, we issued TubeSolar 120,000 shares of common stock upon the conversion by TubeSolar of 60 shares of Series 1A Preferred Stock. On September 3, 2021, we issued TubeSolar 80,000 shares of common stock upon the conversion by TubeSolar of 40 shares of Series 1A Preferred Stock.

On September 15, 2021, we entered into the JDA with TubeSolar to pursue the APV market. We also jointly established the JV. See “Item 1 Business” for additional detail.

On February 1, 2022:

- Crowdex converted their remaining 1,300 shares of Series 1A Preferred Stock into 2,600,000 shares of common stock;
- TubeSolar converted their remaining 2,400 shares of Series 1A Preferred Stock into 4,800,000 shares of common stock.

Relationship with BD1

On December 18, 2020, the Company entered into a securities exchange agreement (“BD1 Exchange Agreement”) with BD1. BD1 had previously acquired all of the Company’s existing outstanding unsecured notes (other than notes held by Global Ichiban and Crowdex) from the original note holders. Pursuant to the terms of the BD1 Exchange Agreement, BD1 agreed to surrender and exchange all of its outstanding promissory notes with principal balances of approximately \$10.4 million (including accrued interest and default penalties). In exchange and without the payment of any additional consideration, the Company issued to BD1 two unsecured convertible promissory notes with principal amounts of \$10,340,000 (the “First Exchange Note”) and \$160,000 (the “Second Exchange Note”). On August 16, 2021, BD1 sold and assigned a portion of the First Exchange Note equal to \$600,000 in principal amount to Nanyang Investment Management Pte Ltd (“Nanyang”) on behalf of a client account for a purchase price of \$600,000, and on January 21, 2022, further sold and assigned a portion of the First Exchange Note equal to \$1,000,000 in principal amount to Nanyang on behalf of a client account for a purchase price of \$1,000,000. On January 3, 2022, BD1 sold and assigned a portion of the First Exchange Note equal to \$1,000,000 in principal amount to Fleur Capital Pte Ltd (“Fleur”) on behalf of a client account for a purchase price of \$1,000,000. The Company has issued to BD1 an unsecured convertible promissory note with principal amount of \$7,740,000 replacing the First Exchange Note (the “Replacement Note” and, together with the Second Exchange Note, the “BD1 Exchange Notes”).

On August 2, 2021, we entered into a securities purchase agreement with BD1 for the private placement of an aggregate of 133,334 shares of our common stock at a fixed price of \$75 (as adjusted for the reverse stock split) per share in two tranches of 66,667 shares in exchange for \$10,000,000 of aggregate gross proceeds. On September 2, 2021, we closed on the first tranche and, on November 5, 2021, we closed on the second tranche, receiving aggregate gross proceeds of \$10,000,000.

On February 1, 2022, BD1 converted its \$7,900,000 aggregate outstanding principal amount of BD1 Exchange Notes into 15,800,000 shares of common stock.

Johannes Kuhn is the indirect beneficial owner of BD1.

Relationship with Global Ichiban

On September 9, 2020, the Company entered into a securities exchange agreement (“GI Exchange Agreement”) with Global Ichiban Limited, a British Virgin Islands corporation (“GI”).

Pursuant to the terms of the GI Exchange Agreement, GI agreed to surrender and exchange all of its existing outstanding promissory notes with an aggregate principal balance of \$6,374,666 (including accrued interest). In exchange, the Company issued to GI a secured convertible promissory note with a principal amount of \$6,400,000 (“GI Exchange Note”).

On March 9, 2021, the Company entered into a settlement agreement (“Settlement”) with GI. Pursuant to the Settlement, the Company issued 33,600 shares of Common Stock of the Company (“Settlement Shares”) to GI in exchange for the cancellation of the GI Exchange Note, which had an outstanding principal balance of \$5,800,000. The GI Exchange Note, which was originally scheduled to mature on September 30, 2022, had a variable-rate conversion feature that entitled GI to convert into shares of Common Stock of the Company at 80% of the 5-day average closing bid-price prior to any conversion.

Policies and Procedures with Respect to Transactions with Related Persons

The Board recognizes that related person transactions can present a heightened risk of potential or actual conflicts of interest. Accordingly, our Audit Committee charter requires that all such transactions will be reviewed and subject to approval by members of our Audit Committee, which will have access, at our expense, to our or independent legal counsel. Future transactions with our officers, directors or greater than five percent stockholders will be on terms no less favorable to us than could be obtained from independent third parties.

Director Independence

Our Board of Directors has determined that three out of our five directors are independent directors, as defined under the applicable rules of the Nasdaq and OTC Markets listing standards. The independent directors are Messrs. Kumar, Huntley and Clarke.

Item 14. Principal Accounting Fees and Services

PRINCIPAL ACCOUNTANTS

Fees for audit and related services by our accounting firm, Haynie & Company, for the years ended December 31, 2021 and 2020 were as follows:

	2021	2020
Audit fees	\$ 155,500	\$ 155,500
Audit related fees	12,700	29,236
Total audit and audit related fees	168,200	184,736
Tax fees	-	22,000
All other fees	-	-
Total Fees	<u>\$ 168,200</u>	<u>\$ 206,736</u>

Audit fees for Haynie & Company for fiscal year 2021 and 2020 represents aggregate fees for the 2021 and 2020 annual audit and quarterly reviews of the financial statements. Audit-related services consisted primarily of audit of employee benefit plan and work performed in connection with our registration statements.

Audit Committee Pre-Approval Policies and Procedures

The Audit Committee charter provides that the Audit Committee will pre-approve all audit services and non-audit services to be provided by our independent auditors before the accountant is engaged to render these services. The Audit Committee may consult with management in the decision making process, but may not delegate this authority to management. The Audit Committee may delegate its authority to pre-approve services to one or more committee members, provided that the designees present the pre-approvals to the full committee at the next committee meeting. All audit and non-audit services performed by our independent accountants have been pre-approved by our Audit Committee to assure that such services do not impair the auditors’ independence from us.

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	<u>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))</u>
3.2	<u>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)</u>
3.3	<u>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)</u>
3.4	<u>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)</u>
3.5	<u>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)</u>
3.6	<u>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)</u>
3.7	<u>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)</u>
3.8	<u>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)</u>
3.9	<u>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)</u>
3.10	<u>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)</u>
3.11	<u>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)</u>
3.12	<u>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)</u>
3.13	<u>Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the Company, dated March 16, 2017 (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K filed March 17, 2017)</u>
3.14	<u>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)</u>
3.15	<u>Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the Company, dated September 23, 2021 (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K filed September 24, 2021)</u>
3.16	<u>Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the Company, dated January 27, 2022 (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K filed February 2, 2022)</u>
4.1	<u>Form of Common Stock Certificate (incorporated by reference to Exhibit 4.1 to our Registration Statement on Form SB-2/A filed on June 6, 2006 (Reg. No. 333-131216))</u>
4.2	<u>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))</u>
4.3*	<u>Description of Securities</u>
10.1	<u>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))</u> CTR
10.2	<u>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))</u> CTR

10.3	<u>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))</u>
10.4	<u>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))</u> CTR
10.5	<u>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))</u>
10.6	<u>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)</u> CTR
10.7	<u>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)</u>
10.8†	<u>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)</u>
10.9†	<u>Seventh Amended and Restated 2005 Stock Option Plan (incorporated by reference to Annex B of our definitive proxy statement dated April 22, 2016)</u>
10.10†	<u>Seventh Amended and Restated 2008 Restricted Stock Plan Stock Option Plan Plan (incorporated by reference to Annex A of our definitive proxy statement dated April 22, 2016)</u>
10.11	<u>Industrial Lease for 12300 Grant Street, Thornton, Colorado dated September 21, 2020 (incorporated by reference to Exhibit 10.50 to our Annual Report on Form 10-K filed January 29, 2021)</u>
10.12	<u>Long-Term Supply and Joint Development Agreement dated September 15, 2021 (incorporated by reference to Exhibit 10.2 to our Quarterly Report on Form 10-Q for the quarter ended September 30, 2021)</u>
10.13*	<u>Fleur Capital Unsecured Convertible Promissory Note dated January 3, 2022</u>
10.14*	<u>Nanyang Unsecured Convertible Promissory Note dated January 21, 2022</u>
23.1*	<u>Consent of Haynie & Company</u>
31.1*	<u>Chief Executive Officer Certification pursuant to section 302 of the Sarbanes-Oxley Act of 2002</u>
31.2*	<u>Chief Financial Officer Certification pursuant to section 302 of the Sarbanes-Oxley Act of 2002</u>
32.1*	<u>Chief Executive Officer Certification pursuant to section 906 of the Sarbanes-Oxley Act of 2002</u>
32.2*	<u>Chief Financial Officer Certification pursuant to section 906 of the Sarbanes-Oxley Act of 2002</u>
101.INS	Inline XBRL Instance Document – the instance document does not appear in the Interactive Data File because XBRL tags are embedded within the Inline XBRL document.
101.SCH	Inline XBRL Taxonomy Extension Schema Document
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document
104	Cover Page Interactive Data File (embedded within the Inline XBRL 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.

ASCENT SOLAR TECHNOLOGIES, INC.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized on the 14th day of March, 2022.

ASCENT SOLAR TECHNOLOGIES, INC.

By: /S/ VICTOR LEE

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
/S/ VICTOR LEE Lee Kong Hian (aka Victor Lee)	President & Chief Executive Officer and a Director (Principal Executive Officer)	March 14, 2022
/S/ MICHAEL J. GILBRETH Michael J. Gilbreth	Chief Financial Officer (Principal Financial and Accounting Officer)	March 14, 2022
/S/ AMIT KUMAR Amit Kumar, Ph.D.	Chairman of the Board of Directors	March 14, 2022
/S/ WILL A. CLARKE Will A. Clarke	Director	March 14, 2022
/S/ KIM J. HUNTLEY Kim J. Huntley	Director	March 14, 2022
/S/ DAVID PETERSON David Peterson	Director	March 14, 2022

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 Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Ascent Solar Technologies, Inc. (the Company) as of December 31, 2021 and 2020, and the related statements of operations, stockholders' deficit, and cash flows for each of the years in the two-year period ended December 31, 2021, and the related notes (collectively referred to as the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the years in the two-year period ended December 31, 2021, in conformity with accounting principles generally accepted in the United States of America.

Substantial Doubt about the Company's Ability to Continue as a Going Concern

The accompanying consolidated financial statements have been prepared assuming that the Company will continue as a going concern. As more fully described in Note 4 to the consolidated financial statements, the Company has continued limited photovoltaic production at its manufacturing facility and 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. 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 consolidated financial statements. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated financial statements based on our 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 audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits, we are required to obtain an understanding of internal control over financial reporting, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

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

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Complex Financing Transactions and Derivative Liabilities

Description of the Matter:

As discussed in Notes 9, 11, and 12 to the consolidated financial statements, the Company's financing transactions include conversions to equity and agreements to restructure debt through assignment or settlement. Certain convertible notes were convertible into a variable number of shares, and the conversion feature was bifurcated from the debt host and accounted for as a derivative liability. Accounting for troubled debt restructuring and derivative liabilities is complex and involves significant judgement and estimations.

How We Addressed the Matter in Our Audit:

We reviewed the underlying assignment and settlement agreements, evaluated management's troubled debt restructuring analysis, and confirmed outstanding balances with lenders. We also reviewed the Company's debt agreements to determine if there were unidentified derivatives.

/s/ Haynie & Company

Haynie & Company
Salt Lake City, Utah
March 14, 2022

We have served as the Company's auditor since 2017.

ASCENT SOLAR TECHNOLOGIES, INC.
CONSOLIDATED BALANCE SHEETS

	December 31, 2021	December 31, 2020
ASSETS		
Current Assets:		
Cash and cash equivalents	\$ 5,961,760	\$ 167,725
Trade receivables, net of allowance of \$26,000 and \$45,883, respectively	49,250	5,539
Inventories	592,172	534,431
Prepaid and other current assets	247,736	71,575
Total current assets	6,850,918	779,270
Property, Plant and Equipment:		
Accumulated depreciation	(22,146,273)	(24,848,408)
	279,662	18,768
Other Assets:		
Operating lease right-of-use assets, net	4,984,688	5,633,663
Patents, net of accumulated amortization of \$135,050 and \$467,102, respectively	86,595	439,836
Equity method investment	21,205	-
Other non-current assets	625,000	500,000
	5,717,488	6,573,499
Total Assets	12,848,068	7,371,537
LIABILITIES AND STOCKHOLDERS' DEFICIT		
Current Liabilities:		
Accounts payable	\$ 642,165	\$ 736,986
Related party payables	45,000	135,834
Accrued expenses	991,534	1,518,212
Accrued interest	475,671	438,063
Notes payable	250,000	250,000
Current portion of operating lease liability	646,742	575,404
Promissory notes, net	-	193,200
Embedded derivative liability	-	5,303,984
Total current liabilities	3,051,112	9,151,683
Long-Term Liabilities:		
Non-current operating lease liabilities	4,532,490	5,179,229
Non-current secured promissory notes, net	-	5,405,637
Non-current convertible notes, net	8,076,847	7,813,048
Accrued warranty liability	21,225	14,143
Total liabilities	15,681,674	27,563,740
Stockholders' Deficit:		
Series A preferred stock, \$.0001 par value; 750,000 shares authorized; 48,100 and 48,100 shares issued and outstanding, respectively (\$801,533 and \$752,765 Liquidation Preference, respectively)	5	5
Common stock, \$.0001 par value, 500,000,000 authorized; 4,786,804 and 3,659,828 shares issued and outstanding, respectively	479	368
Additional paid in capital	424,948,698	401,590,209
Accumulated deficit	(427,782,788)	(421,782,785)
Total stockholders' deficit	(2,833,606)	(20,192,203)
Total Liabilities and Stockholders' Deficit	\$ 12,848,068	\$ 7,371,537

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,	
	2021	2020
Revenues		
Products	\$ 607,783	\$ 66,613
Total Revenues	607,783	66,613
Costs and Expenses		
Costs of revenue	1,902,414	174,588
Research, development and manufacturing operations	4,140,319	1,165,193
Selling, general and administrative	3,297,982	1,029,720
Depreciation and amortization	57,314	151,658
Total Costs and Expenses	9,398,029	2,521,159
Loss from Operations	(8,790,246)	(2,454,546)
Other Income/(Expense)		
Other income/(expense), net	(169,423)	3,002,170
Interest expense	(1,088,327)	(3,507,533)
Change in fair value of derivatives and loss on extinguishment of liabilities, net	4,047,993	4,577,353
Total Other Income/(Expense)	2,790,243	4,071,990
Net Income/(Loss)	\$ (6,000,003)	\$ 1,617,444
Net Income/(Loss) Per Share (Basic)	\$ (1.54)	\$ 1.15
Net Income/(Loss) Per Share (Diluted)	\$ (1.54)	\$ 0.32
Weighted Average Common Shares Outstanding (Basic)	3,894,015	1,410,347
Weighted Average Common Shares Outstanding (Diluted)	3,894,015	3,721,120

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

ASCENT SOLAR TECHNOLOGIES, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' DEFICIT

	Series A Preferred Stock		Series A1 Preferred Stock		Common Stock		Additional Paid-In	Accumulated	Total Stockholders' Equity (Deficit)
	Shares	Amount	Shares	Amount	Shares	Amount	Capital	Deficit	
Balance at January 1, 2020	<u>48,100</u>	<u>\$ 5</u>	<u>-</u>	<u>\$ -</u>	<u>991,143</u>	<u>\$ 99</u>	<u>\$ 398,293,344</u>	<u>\$ (423,400,229)</u>	<u>\$ (25,106,781)</u>
Interest Expense paid with Common Stock	-	-	-	-	4,266	-	2,132	-	2,132
Proceeds from issuance of Series 1A Preferred Stock	-	-	1,300	-	-	-	1,300,000	-	1,300,000
Stock issued for fees	-	-	-	-	-	-	-	-	-
Loss on Extinguishment of Liabilities	-	-	-	-	-	-	150,000	-	150,000
Conversion of Bellridge Note into Common Shares	-	-	-	-	90,000	9	44,991	-	45,000
Conversion of Global Ichiban Note into Common Shares	-	-	-	-	174,419	18	599,984	-	600,002
Conversion of Series A1 Preferred Stock into Common Stock	-	-	-	-	2,400,000	240	1,199,760	-	1,200,000
Net Income								1,617,444	1,617,444
Balance at December 31, 2020	<u>48,100</u>	<u>\$ 5</u>	<u>1,300</u>	<u>\$ -</u>	<u>3,659,828</u>	<u>\$ 366</u>	<u>\$ 401,590,211</u>	<u>\$ (421,782,785)</u>	<u>(20,192,203)</u>
Proceeds from issuance of Series 1A Preferred Stock	-	-	2,500	-	-	-	2,500,000	-	2,500,000
Proceeds from issuance of Common Stock	-	-	-	-	148,334	15	12,999,985	-	13,000,000
Conversion of Global Ichiban Note into Common Shares	-	-	-	-	33,600	3	5,799,997	-	5,800,000
Loss on Extinguishment of Liabilities	-	-	-	-	-	-	1,686,079	-	1,686,079
Conversion of TubeSolar Series 1A Preferred Stock into Common Stock	-	-	(100)	-	200,000	20	(20)	-	-
Conversion of Nanyang Note into Common Stock	-	-	-	-	200,000	20	99,980	-	100,000
Conversion of Crowdex into Common Stock	-	-	-	-	545,042	55	272,466	-	272,521
Net Income								(6,000,003)	(6,000,003)
Balance at December 31, 2021	<u>48,100</u>	<u>\$ 5</u>	<u>3,700</u>	<u>\$ -</u>	<u>4,786,804</u>	<u>\$ 479</u>	<u>\$ 424,948,698</u>	<u>\$ (427,782,788)</u>	<u>(2,833,606)</u>

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,	
	2021	2020
Operating Activities:		
Net income/(loss)	\$ (6,000,003)	\$ 1,617,444
Adjustments to reconcile net loss to cash used in operating activities:		
Depreciation and amortization	57,314	151,658
Operating lease asset amortization	648,975	185,827
Patent write off	297,702	—
Realized (gain) on sale and foreclosure of assets	—	(2,987,170)
Amortization of deferred financing costs	—	4,525
Non-cash interest expense	—	820,035
Amortization of debt discount	1,008,162	1,381,685
Bad debt expense	—	(141)
Warranty reserve	7,082	(14,261)
Change in fair value of derivatives and (gain) on extinguishment of liabilities, net	(4,047,993)	(4,577,353)
Changes in operating assets and liabilities:		
Accounts receivable	(43,711)	(5,398)
Inventories	(57,741)	(539)
Prepaid expenses and other current assets	(301,161)	(524,502)
Accounts payable	(77,173)	(321,576)
Related party payable	(90,834)	(174,339)
Operating lease liabilities	(575,401)	(64,856)
Accrued interest	62,781	1,225,578
Accrued expenses	(292,442)	398,464
Net cash (used in) operating activities	(9,404,443)	(2,884,919)
Investing Activities:		
Purchase of property, plant and equipment	(280,317)	—
Contributions to equity method investment	(21,205)	—
Proceeds on sale of assets	—	254,600
Patent activity costs	—	(156)
Net cash provided by (used in) investing activities	(301,522)	254,444
Financing Activities:		
Proceeds from debt issuance	—	443,200
Repayment of debt	—	(145,000)
Proceeds from issuance of stock	15,500,000	2,500,000
Net cash provided by (used in) financing activities	15,500,000	2,798,200
Net change in cash and cash equivalents	5,794,035	167,725
Cash and cash equivalents at beginning of period	167,725	—
Cash and cash equivalents at end of period	\$ 5,961,760	\$ 167,725
Supplemental Cash Flow Information:		
Cash paid for interest	\$ —	\$ —
Non-Cash Transactions:		
Conversions of preferred stock and convertible notes to equity	\$ 6,072,521	\$ 647,132
Series 1A preferred stock conversion	\$ 100,000	\$ —
Extinguishment of note payable	\$ 193,200	\$ —
Operating lease assets obtained in exchange for operating lease liabilities	\$ —	\$ (5,819,489)
Non-cash mortgage derecognition	\$ —	\$ (6,443,897)
Non-cash property foreclosure	\$ —	\$ 6,443,897
Initial embedded derivative liabilities	\$ —	\$ (447,903)
Promissory notes exchanged for convertible notes	\$ —	\$ 650,000

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

ASCENT SOLAR TECHNOLOGIES, INC.
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, core technologies, and certain trade secrets and royalty free licenses to use in connection with the manufacturing, developing marketing, and commercializing Copper-Indium-Gallium-diSelenide (“CIGS”) photovoltaic (“PV”) products. ITN, a private company incorporated in 1994, is an incubator dedicated to the development of thin film, 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 CIGS PV products in particular. ITN formed Ascent to commercialize its investment in CIGS PV technologies.

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.

On September 15, 2021, the Company entered into the JDA with TubeSolar, a significant existing stakeholder in the Company. Under the terms of the JDA, the Company will produce, and TubeSolar will purchase, thin-film PV Foils for use in TubeSolar’s solar modules for APV applications that require solar foils for its production. Under the JDA, the Company will receive up (i) to \$4 million of NRE fees, (ii) up to \$13.5 million of payments upon achievement of certain agreed production and cost structure milestones, and (iii) product revenues from sales of PV Foils to TubeSolar. The JDA has no fixed term, and may only be terminated by either party for breach. The Company recognized \$40,000 in product revenue from TubeSolar during the year ended December 31, 2021.

The Company and TubeSolar have also jointly established Ascent Solar Technologies Germany GmbH (“Ascent Germany”), in which TubeSolar holds of 30% of the entity. The purpose of Ascent Germany is to establish and operate a PV manufacturing facility in Germany that will produce and deliver PV Foils exclusively to TubeSolar. Until Ascent Germany’s facility is fully operational, PV Foils will be manufactured in the Company’s existing facility in Thornton, Colorado. The parties expect to jointly develop next generation tooling for use in manufacturing PV Foils at the JV facility. The Company purchased 17,500 shares of the JV for 1 Euro per share and accounts for this investment as an equity method investment as it does not have control of this entity, but does have significant influence over the activities that most significantly impacts the entity’s operations and financial performance. The Company currently cannot quantify its maximum exposure in this entity.

On January 28, 2022 as of 5:00 pm Eastern Time, the Company effected a reverse stock split of the Company’s common stock, par value \$0.0001 per share (the “Common Stock”) at a ratio of one-for-five thousand (the “Reverse Stock Split”). The Company’s common stock began trading on a split-adjusted basis at 9:30 am Eastern Time on January 31, 2022. Stockholders also received one whole share of Common Stock in lieu of a fractional share and no fractional shares were issued. All shares and per share amounts in the consolidated financial statements and accompanying notes have been retroactively adjusted to give effect to the Reverse Stock Split.

Following the Reverse Stock Split, the Company’s issued and outstanding shares of Common Stock were decreased from approximately 23.74 billion pre-split shares to 4.81 million post-split shares. In connection with the Reverse Stock Split effectiveness, the number of authorized shares of the Company’s Common Stock were decreased from 30 billion to 500 million shares.

Although the Company is focused on various markets for its product, the Chief Executive Officer makes significant operating decisions and assesses the performance of the Company as a single business segment. Accordingly, the Company has one reportable segment.

NOTE 2. BASIS OF PRESENTATION

The accompanying consolidated financial statements have been derived from the accounting records of Ascent Solar Technologies, Inc. and its direct and indirectly wholly owned subsidiaries Ascent Solar (Asia) Pte. Ltd., and Ascent Solar (Shenzhen) Co., Ltd. (collectively, the “Company”) as of December 31, 2021 and 2020, and the results of operations for the years ended December 31, 2021 and 2020. Ascent Solar (Shenzhen) Co., Ltd. is wholly owned by Ascent Solar (Asia) Pte. Ltd. All significant inter-company balances and transactions have been eliminated in the accompanying consolidated financial statements.

The preparation of financial statements in conformity with US 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.

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, 2021, and 2020, the Company had inventory reserve balances of \$395,943 and \$598,392, respectively. If actual demand and market conditions are less favorable than those estimated by management, additional inventory write downs may be required.

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 10 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
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. As of December 31, 2021, and 2020, the Company had \$86,595 and \$439,836 of net patent costs, respectively. Of these amounts \$45,015 and \$103,740 represent costs net of amortization incurred for awarded patents, and the remaining \$41,580 and \$663,892 represents costs incurred for patent in process applications as of December 31, 2021 and 2020, respectively. During the years ended December 31, 2021 and 2020, the Company capitalized \$0 and \$156 in patent costs, respectively, as it worked to secure design rights and trademarks for newly developed products. Amortization expense was \$37,891 and \$45,920 for the years ended December 31, 2021 and 2020, respectively.

During the year ended December 31, 2021, the Company concluded that certain expired patents were not curable and certain patents in process would not be granted. As such, during the year ended December 31, 2021, the Company wrote off the remaining book value of these assets and recorded a charge of \$297,702 in Other income/(expense) in the consolidated statement of operations.

As of December 31, 2021, future amortization of patents is expected as follows:

2022	\$ 19,169
2023	19,168
2024	6,493
2025	185
2026	-
	<u>\$ 45,015</u>

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, 2021 and 2020, the Company did not incur impairments of its manufacturing facilities and equipment.

Equity Method Investment: The Company accounts for its investments in stock of other entities over which the Company has significant influence, but not control, using the equity method of accounting. Under the equity method of accounting, the Company increases its investment for contributions made and records its proportionate share of net earnings, declared dividends and partnership distributions based on the most recently available financial statements of the investee. The Company re-evaluates the classification at each balance sheet date and when events or changes in circumstances indicate that there is a change in the Company's ability to exercise significant influence. The Company evaluates its equity method investments for potential impairment whenever events or changes in circumstances indicate that there is an other-than-temporary decline in the value of the investment. Declines in fair value that are deemed to be other-than-temporary are charged to Other income (expense), net.

Related Party Payables: The Company accounts for fees due to board members in the related party payables account on the consolidated balance sheets.

Convertible Notes: The Company issues, from time to time, convertible notes. Refer to Note 11 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. Refer to Notes 11 and 12 for further discussion on embedded derivatives.

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.

Leases: The Company determines if an arrangement is a lease or contains a lease at the inception of the contract. The Company accounts for non-lease components, such as certain taxes, insurance and common area maintenance, separate from the lease arrangement. Operating lease liabilities, which represent the Company's obligation to make lease payments arising from the lease, and corresponding Operating lease right-of-use assets, which represent the Company's right to use an underlying asset for the lease term, are recognized at the commencement date of the lease based on the present value of fixed future payments over the lease term. The Company utilizes the lease term for which it is reasonably certain to use the underlying asset, including consideration of options to extend or terminate the lease. Incentives received from landlords are recorded as a reduction to the lease right-of-use assets. The Company does not recognize lease right-of-use assets and corresponding lease liabilities for leases with initial terms of 12 months or less.

The Company calculates the present value of future payments using the discount rate implicit in the lease, if available, or its incremental borrowing rate. The incremental borrowing rate is the rate of interest that a lessee would have to pay to borrow on a collateralized basis over a similar term at an amount equal to the lease payments in a similar economic environment. In determining the Company's operating lease right of use assets and operating lease liabilities, the Company applied these incremental borrowing rates to the minimum lease payments within the lease agreement.

Revenue Recognition:

Product revenue. We recognize revenue for the sale of PV modules 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.

During the years ended December 31, 2021 and 2020, the Company recognized product revenue of \$607,783 and \$66,613, respectively.

Milestone revenue. Each milestone arrangement is a separate performance obligation. The transaction price is estimated using the most likely amount method and revenue is recognized as the performance obligation is satisfied through achieving manufacturing or cost targets and engineering targets. No milestone revenue was recognized for the years ended December 31, 2021 and 2020.

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.

No government contract revenue was recognized for the years ended December 31, 2021 and 2020.

As a practical expedient, the Company elects to exclude disclosures related to certain unsatisfied performance obligations. These performance obligations include the milestone performance obligations which are wholly unsatisfied as of December 31, 2021.

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 creditworthiness and current economic trends. Reserves are established on an account-by-account basis and 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.

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.

As of December 31, 2021 and 2020, the Company had an accounts receivable, net balance of \$49,250 and \$5,539, respectively. As of December 31, 2021 and 2020, the Company had an allowance for doubtful accounts of \$26,000 and \$45,883, respectively.

The payment terms and conditions in customer contracts vary. Customers required to prepay are represented by the contract liabilities, included in Accrued Liabilities on the Consolidated Balance Sheets, until the Company's performance obligations are satisfied. Invoiced customers are typically required to pay within 30 days of invoicing. Deferred revenue was as follows:

Balance as of January 1, 2020	\$	-
Additions		307,500
Recognized as revenue		-
Balance as of December 31, 2020		307,500
Additions		22,500
Recognized as revenue		(307,500)
Balance as of December 31, 2021	\$	<u>22,500</u>

For the years ended December 31, 2021 and 2020, one customer's revenue individually represented 83% and 67%, respectively, of the Company's total revenue.

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 \$4,140,319 and \$1,165,193 for the years ended December 31, 2021 and 2020, 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 \$8,912 and \$3,559 for the years ended December 31, 2021 and 2020, respectively.

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 (2018-2021) 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.

Earnings per Share: Earnings per share ("EPS") are the amount of earnings attributable to each share of common stock. Basic EPS has been computed by dividing income available to common stockholders by the weighted-average number of common shares outstanding during the period. Income available to common stockholders has been computed by deducting dividends accumulated for the period on cumulative preferred stock (whether or not earned) from net income. Diluted earnings per share have been computed by dividing net income adjusted on an if-converted basis for the period by the weighted average number of common shares and potentially dilutive common share outstanding (which consist of options and convertible securities using the treasury stock method or the if-converted method, as applicable, to the extent they are dilutive).

Approximately 28.2 million dilutive common shares for the year ended December 31, 2021 were omitted because they were anti-dilutive. There were approximately 2.3 million dilutive shares for the year ended December 31, 2020.

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 5. Property, Plant and Equipment and Note 11. 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 and are considered to be Level 2. The carrying value for cash and cash equivalents, accrued expenses and other assets and liabilities approximate their fair values due to their short maturities.

Recently Issued Accounting Standards

In August 2020, the FASB issued ASU No. 2020-06, *Debt – Debt with Conversion and Other Options (Subtopic 470-20) and Derivatives and Hedging Contracts in Entity's Own Equity (Subtopic 815-40): Accounting for Convertible Instruments and Contracts in an Entity's Own Equity*. ASU 2020-06 will simplify the accounting for convertible instruments by reducing the number of accounting models for convertible debt instruments and convertible preferred stock. Limiting the accounting models results in fewer embedded conversion features being separately recognized from the host contract as compared with current GAAP. Convertible instruments that continue to be subject to separation models are (1) those with embedded conversion features that are not clearly and closely related to the host contract, that meet the definition of a derivative, and that do not qualify for a scope exception from derivative accounting and (2) convertible debt instruments issued with substantial premiums for which the premiums are recorded as paid-in capital. ASU 2020-06 also amends the guidance for the derivatives scope exception for contracts in an entity's own equity to reduce form-over-substance-based accounting conclusions. ASU 2020-06 will be effective for smaller reporting public companies for fiscal years beginning after December 15, 2023, including interim periods within those fiscal years. Early adoption is permitted, but no earlier than fiscal years beginning after December 15, 2020, including interim periods within those fiscal years. Management has not yet evaluated the impact that the adoption of ASU 2020-06 will have on the Company's consolidated financial statement presentation or disclosures.

Other new pronouncements issued but not effective as of December 31, 2021 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, 2021 and 2020, the Company entered into multiple financing agreements to fund operations. Further discussion of these transactions can be found in Notes 8, 9, 10, and 11.

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, 2021 the Company used \$9,404,443 in cash for operations. As of December 31, 2021, the Company had \$2,365,087 in net debt (debt adjusted for cash and cash equivalents), and \$687,165 in payables. Also, as of December 31, 2021, the Company owed \$475,671 in interest.

Additional projected product revenues are not anticipated to result in a positive cash flow position for the year 2022 overall and, as of December 31, 2021, the Company has a working capital of \$3,799,806. As such, cash liquidity sufficient for the year ending December 31, 2022 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.

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. PROPERTY, PLANT AND EQUIPMENT

The following table summarizes property, plant and equipment as of December 31, 2021 and 2020:

	As of December 31,	
	2021	2020
Furniture, fixtures, computer hardware and computer software	\$ 473,448	\$ 489,421
Manufacturing machinery and equipment	21,863,624	24,377,755
Manufacturing machinery and equipment, in progress	88,863	-
Depreciable property, plant and equipment	22,425,935	24,867,176
Less: Accumulated depreciation and amortization	(22,146,273)	(24,848,408)
Net property, plant and equipment	\$ 279,662	\$ 18,768

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, 2021 and 2020 was \$19,423 and \$105,738, respectively. Depreciation expense is recorded under "Depreciation and amortization expense" in the Consolidated Statements of Operations.

On July 29, 2020 the Company's owned facility at 12300 Grant Street, Thornton, CO 80241 (the "Building") was foreclosed by the Building's first lien holder ("Mortgage Holder") and sold at public auction. The successful bidder for the Building was the Mortgage Holder, at the price of \$7.193 million. As a result, the Company's obligations to Mortgage Holder and all of the Company's outstanding real property taxes on the Building were considered fully repaid. The Company recognized a gain of approximately \$3 million on the sale of the property.

On September 21, 2020, the Company entered into a lease agreement with 12300 Grant LLC ("Landlord"), an affiliated company of the Mortgage Holder, for approximately 100,000 rentable square feet of the Building (the "Lease"). The lease is classified as an operating lease and accounted for accordingly. The Lease term is for 88 months commencing on September 21, 2020 at a rent of \$50,000 per month including taxes, insurance and common area maintenance until December 31, 2020. Beginning January 1, 2021, the rent shall adjust to \$80,000 per month on a triple net basis and shall increase at an annual rate of 3% per annum until December 31, 2027.

As of December 31, 2021 and 2020, assets and liabilities related to the Company's lease were as follows:

	As of December 31,	
	2021	2020
Operating lease right-of-use assets, net	\$ 4,984,688	\$ 5,633,663
Current portion of operating lease liability	646,742	575,404
Non-current portion of operating lease liability	4,532,490	5,179,229

During the years ended December 31, 2021 and 2020 the Company recorded operating lease costs included in rent expense of \$1,033,570 and \$287,103, respectively.

Future maturities of the operating lease liability are as follows:

2022	\$	988,800
2023		1,018,464
2024		1,049,018
2025		1,080,488
2026		1,112,903
Thereafter		1,146,291
Total lease payments	\$	6,395,964
Less amounts representing interest		(1,216,732)
<i>Present value of lease liability</i>	\$	5,179,232

The remaining lease term and discount rate of the operating lease is 72.5 months and 7.0% respectively.

NOTE 6. INVENTORIES

Inventories consisted of the following at December 31, 2021 and 2020:

	As of December 31,	
	2021	2020
Raw materials	\$ 575,154	\$ 525,626
Work in process	15,803	-
Finished goods	1,215	8,805
Total	<u>\$ 592,172</u>	<u>\$ 534,431</u>

NOTE 7. NOTES PAYABLE

Prior to 2020, the Company entered into two agreements with a vendor ("Vendor 1") to convert the balance of their account into four notes payable in the aggregate amount of \$1,073,825. The notes bear interest of 6% per annum and matured on February 24, 2018 and July 31, 2018, respectively, but remained unpaid as of January 1, 2020. At January 1, 2020, the aggregate principal and accrued interest balances were \$1,073,825 and \$162,205, respectively. On September 11, 2020, the Company entered into a settlement agreement (the "Settlement Agreement A") with Vendor 1 and paid \$120,000 on September 23, 2020 as the full and final settlement of all amounts owed between the parties. Following payment, a satisfaction of an existing judgment in favor of Vendor 1 was filed in Adams County, Colorado. The Company booked a gain of approximately \$1.1 million relating to Settlement Agreement A.

Prior to 2020, the Company entered into an agreement with another vendor ("Vendor 2") 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, 2021, the Company had not made any payments on this note, the accrued interest was \$56,336, and the note is due upon demand. To the best of our knowledge, Vendor 2 had not made any attempts to recover any amount owing to them since 2019.

Prior to 2020, 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 December 31, 2019. The Company made principal and interest payments of \$32,529 and \$897, respectively. At January 1, 2020, the remaining principal and accrued interest balances were \$182,705 and \$21,933, respectively. On September 11, 2020, the Company entered into a settlement agreement (the "Settlement Agreement B") with the customer and paid \$20,000 on September 18, 2020 as the full and final settlement of all amounts owed between the parties. The Company booked a gain of approximately \$185,000 relating to Settlement Agreement B.

NOTE 8. DEBT

On August 2, 2019, Colorado Housing and Finance Authority (“CHFA”) entered into an agreement to assign the mortgage note to Iliad Research and Trading, L.P., a Utah limited liability partnership (“IRT”). This agreement closed on September 11, 2019, and IRT paid a total of \$5,885,148 to CHFA to assume the note. The payment amount consisted of \$5,405,666 of principal and \$479,482 of interest and fees. Interest was accrued on the note at the default interest rate of 10.5%. At January 1, 2020, the remaining principal and accrued interest balances were \$5,885,148 and \$190,158, respectively.

On July 29, 2020, the Company’s owned facility at 12300 Grant Street, Thornton, CO 80241 (the “Building”) was foreclosed by IRT and sold at public auction.

NOTE 9. SECURED PROMISSORY NOTE

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

	Global Ichiban	St. George	BD1	Total
Secured Notes Principal Balance at January 1, 2020	5,012,897	2,160,000	—	\$ 7,172,897
New notes	6,400,000	—	—	6,400,000
Note conversions	(600,000)	—	—	(600,000)
Note Assignments	—	(2,160,000)	2,160,000	—
Notes Exchanged	(5,012,897)	—	(2,160,000)	(7,172,897)
Secured Notes Principal Balance at December 31, 2020	5,800,000	—	—	5,800,000
Less: remaining discount	(394,363)	—	—	(394,363)
Secured Notes, net of discount, at December 31, 2020	5,405,637	—	—	5,405,637
New notes	—	—	—	—
Note conversions	(5,800,000)	—	—	(5,800,000)
Secured Notes Principal Balance at December 31, 2021	\$ —	\$ —	\$ —	\$ —

Global Ichiban Secured Promissory Notes

Prior to 2020, the Company had issued secured notes to Global Ichiban Limited (“Global”) that had aggregate remaining principal and accrued interest balances of \$5,012,897 and \$885,475, respectively, as of January 1, 2020.

All principal and accrued interest on the notes was 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) \$10,000 per share, at the option of the Company.

The notes may not be converted, and shares of the 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.

All the notes issued in accordance with the note purchase and exchange agreement dated November 30, 2017 were 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.

On September 9, 2020, the Company entered into a securities exchange agreement (“GI Exchange Agreement”) with Global. Pursuant to the terms of the GI Exchange Agreement, Global agreed to surrender and exchange all of its existing outstanding promissory notes with an aggregate principal balance of \$6,313,387 (including accrued interest). In exchange, the Company issued to Global a secured convertible promissory note with a principal amount of \$6,400,000 (“GI Exchange Note”). The GI Exchange Note will mature on September 30, 2022. Principal on the GI Exchange Note, if not converted, will be payable in a lump sum on September 30, 2022. The GI Exchange Note will not bear any accrued interest but bears a default

interest rate of 18% in the event of a default under the GI Exchange Note. The GI Exchange Note is secured by a lien on substantially all of the Company's assets pursuant to the Security Agreement dated November 30, 2017 (the "Security Agreement") entered into between the Company and Global. The Company has accounted for the GI Exchange Agreement as a troubled debt restructuring. The future undiscounted cash flow of the new secured convertible promissory note totaling \$6,400,000 is more than the carrying value of the original outstanding promissory notes totaling \$6,313,387, therefore no gain was recorded and a new effective interest rate has been established based on the carrying value of the original promissory notes and revised cash flow. The difference of \$86,613 was recorded as an original issue debt discount and will be charged to interest over the term of the note.

On December 9, 2020, Global converted \$600,000 into 174,419 common shares. On March 9, 2021, the Company entered into a settlement agreement ("Settlement") with Global. Pursuant to the Settlement, the Company issued 33,600 shares of Common Stock of the Company to Global in exchange for the cancellation of the remaining outstanding secured promissory note of \$5,800,000.

The conversion option associated with the note was deemed to include an embedded derivative that required bifurcation and separate accounting. Refer to Note 12. Derivative Liabilities for further details.

St. George Secured Convertible Notes

Prior to 2020, the Company had issued secured notes to St. George Investments LLC ("St. George") that had aggregate remaining principal and accrued interest balances of \$2,160,000 and \$252,751, respectively, as of January 1, 2020. Beginning six months from the date of issuance, 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 prices for the shares over the prior 10-day trading period immediately preceding the conversion.

Shares of common stock may not be issued pursuant to these 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.

The conversion option associated with the notes was deemed to include an embedded derivative that required bifurcation and separate accounting. Refer to Note 12. Derivative Liabilities for further details.

On September 9, 2020, all debts with St. George were assigned to BD1 as part of the Company's recapitalization and restructuring effort which began in June 2020. The Company subsequently entered into an Exchange Agreement with BD1 on December 18, 2020. Refer to the *BD1 Convertible Notes* in Note 11. Convertible Notes for further discussion.

NOTE 10. PROMISSORY NOTES

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

	Investor 1	Investor 2	BD1	SBA	Total
Promissory Notes Principal Balance at January 1, 2020	\$ 494,437	\$ 615,000	\$ —	\$ —	\$ 1,109,437
New principal	—	35,000	—	193,200	228,200
Notes assigned	(494,437)	(650,000)	1,144,437	—	—
Notes exchanged	—	—	(1,144,437)	—	\$(1,144,437)
Promissory Notes Principal Balance at December 31, 2020	—	—	—	193,200	193,200
Notes forgiven	—	—	—	(193,200)	(193,200)
Promissory Notes Balance at December 31, 2021	\$ —	\$ —	\$ —	\$ —	\$ —

Offering of Unsecured, Non-Convertible Notes to Investor 1

Prior to 2020, the Company had issued a note to a private investor ("Investor 1"), that had remaining principal and accrued interest balances of \$494,437 and \$145,971, respectively, as of January 1, 2020. The note bears an interest rate of 12%, and principal and interest on this note were payable at maturity. This note was not convertible into equity shares of the Company and was unsecured.

On September 11, 2020 the debt with Investor 1 was assigned to BD1 as part of the Company's recapitalization and restructuring effort which began in June 2020. The Company subsequently entered into an Exchange Agreement with BD1 on December 18, 2020. Refer to the *BD1 Convertible Notes* in Note 11. Convertible Notes for further discussion.

Offering of Unsecured, Non-Convertible Notes to Investor 2

Prior to 2020, the Company had issued notes to another private investor ("Investor 2"), that had aggregate remaining principal and accrued interest balances of \$615,000 and \$34,046, respectively, as of January 1, 2020. These notes bear interest at a rate of 12% and matured between September 11, 2019 and March 9, 2020. All principal and interest was payable upon maturity.

During 2020, the Company initiated a non-convertible, unsecured promissory note with Investor 2 for an aggregate principal amount of \$150,000. The promissory note was issued with an original issue discount of \$35,000, which will be recorded as interest expense ratably over the term of the note, resulting in proceeds to the company of \$115,000, which was received in several tranches between September 2020 and November 2020. This note bears interest at 12% per annum and matured on May 1, 2021. All principal and interest is payable upon maturity.

On September 11, 2020, the entire debt with Investor 2 was assigned to BD1 as part of the Company's recapitalization and restructuring effort which began in June 2020. The Company subsequently entered into an Exchange Agreement with BD1 on December 18, 2020. Refer to the *BD1 Convertible Notes* in Note 11. Convertible Notes for further discussion.

SBA PPP

On April 17, 2020, the Company obtained a PPP Loan from Vectra Bank Colorado ("Vectra") in the aggregate amount of \$193,200, which was established under the CARES Act, as administered by the Small Business Association ("SBA"). Under the terms of the CARES Act and the PPP, all or a portion of the principal amount of the PPP Loan is subject to forgiveness so long as, over the 24-week period following the Company's receipt of the proceeds of the PPP Loan, the Company uses those proceeds for payroll costs, rent, utility costs or the maintenance of employee and compensation levels. The PPP Loan is unsecured, guaranteed by the SBA, and has a two-year term, maturing on April 17, 2022. Interest accrues on the loan beginning with the initial disbursement; however, payments of principal and interest are deferred until Vectra's determination of the amount of forgiveness applied for by the Company is approved by the SBA. If the Company does not apply for forgiveness within 10 months after the last day of the covered period (defined, at the Company's election as 24 weeks), such payments will be due that month. On September 4, 2021, the Company received notification from Vectra that the SBA has forgiven the PPP

loan. The Company recognized \$195,852 of forgiven principal and accrued interest in Change in fair value of derivatives and gain/(loss) on extinguishment of liabilities, net in the Consolidated Statement of Operations.

NOTE 11. CONVERTIBLE NOTES

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

	Principal Balance 1/1/2020	New Notes	Notes assigned or exchanged	Notes converted	Principal Balance 12/31/2020	Less: Discount Balance	Net Principal Balance 12/31/2020
October 2016 Notes	\$ 330,000	\$ —	\$ (330,000)	\$ —	\$ —	\$ —	\$ —
St. George Notes	617,663	—	(617,663)	—	—	—	—
BayBridge Notes	940,600	—	(940,600)	—	—	—	—
Bellridge Notes	496,000	—	(451,000)	(45,000)	—	—	—
Power Up Notes	106,820	—	(106,820)	—	—	—	—
Widjaja Note	330,000	—	(330,000)	—	—	—	—
GS Capital Notes	169,500	—	(169,500)	—	—	—	—
Penumbra Note (related party)	—	250,000	(250,000)	—	—	—	—
BD1 Notes (related party)	—	10,500,000	—	—	10,500,000	(2,936,952)	7,563,048
Crowdex Note (related party)	—	—	250,000	—	250,000	—	250,000
	<u>\$ 2,990,583</u>	<u>\$ 10,750,000</u>	<u>\$ (2,945,583)</u>	<u>\$ (45,000)</u>	<u>\$ 10,750,000</u>	<u>\$ (2,936,952)</u>	<u>\$ 7,813,048</u>

	Principal Balance 12/31/2020	New Notes	Notes assigned or exchanged	Notes converted	Principal Balance 12/31/2021	Less: Discount Balance	Net Principal Balance 12/31/2021
BD1 Notes (related party)	\$ 10,500,000	\$ —	\$ (600,000)	\$ —	\$ 9,900,000	\$ (2,210,182)	\$ 7,689,818
Crowdex Note (related party)	250,000	—	—	(250,000)	—	—	—
Nanyang Note	—	—	600,000	(100,000)	500,000	(112,971)	387,029
	<u>\$ 10,750,000</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ (350,000)</u>	<u>\$ 10,400,000</u>	<u>\$ (2,323,153)</u>	<u>\$ 8,076,847</u>

October 2016 Convertible Notes

Prior to 2020, the Company had issued convertible notes to a private investor that had remaining principal and accrued interest balances of \$330,000 and \$65,010, respectively, as of January 1, 2020.

The convertible notes matured on December 31, 2017 and bear an interest 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.

The conversion option associated with the notes was deemed to include an embedded derivative that required bifurcation and separate accounting. Refer to Note 12. Derivative Liabilities for further details.

On September 11, 2020, the October 2016 Convertible Notes were assigned to BD1 as part of the Company's recapitalization and restructuring effort which began in June 2020. The Company subsequently entered into an Exchange Agreement with BD1 on December 18, 2020. Refer to the *BD1 Convertible Notes* in Note 11. Convertible Notes for further discussion.

St. George Convertible Note

Prior to 2020, the Company sold and issued a \$1,700,000 convertible note to St. George, which had a principal balance of \$617,663 as of January 1, 2020.

This note matured 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 a default interest rate has not been designated by St. George.

The conversion option associated with the note was deemed to include an embedded derivative that required bifurcation and separate accounting. Refer to Note 12. Derivative Liabilities for further details.

On September 9, 2020, the St. George Convertible Note was assigned to BD1 as part of the Company's recapitalization and restructuring effort which began in June 2020. The Company subsequently entered into an Exchange Agreement with BD1 on December 18, 2020. Refer to the *BD1 Convertible Notes* in Note 11. Convertible Notes for further discussion.

Baybridge Convertible Note

Prior to 2020, the Company had issued convertible notes to BayBridge Capital Fund LP ("BayBridge"), which had remaining principal and accrued interest balances of \$940,600 and \$65,888, respectively, as of January 1, 2020.

The Exchange Notes are unsecured, have no applicable registration rights, bear interest at a rate of 12% per annum, and matured between September 7, 2019 and August 22, 2020. The notes contain standard and customary events of default.

The terms of the Exchange Notes included a conversion feature which was the lesser of (i) a price range of \$2.50 to \$750, or (ii) a range of 65% to 70% of the lowest traded price for the shares over the prior five trading days.

The conversion option associated with the notes was deemed to include an embedded derivative that required bifurcation and separate accounting. Refer to Note 12. Derivative Liabilities for further details.

On September 11, 2020, the Baybridge Convertible Notes were assigned to BD1 as part of the Company's recapitalization and restructuring effort which began in June 2020. The Company subsequently entered into an Exchange Agreement with BD1 on December 18, 2020. Refer to the *BD1 Convertible Notes* in Note 11. Convertible Notes for further discussion.

Bellridge Convertible Notes

Prior to 2020, the Company had issued convertible notes to Bellridge Capital, LP ("Bellridge") which had aggregate principal and accrued interest balances of \$496,000 and \$63,474, respectively, as of January 1, 2020.

The note is not secured, contains no registration rights, has an interest rate of 10% per annum, matured on October 22, 2020, and contains standard and customary events of default. 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) \$2.50 or (ii) 70% of the lowest traded price for the shares over the prior ten-day trading period immediately preceding the conversion. The original issue discount of \$20,000 was charged to interest, ratably, over the life of the note.

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.

During 2020, an aggregate principal of \$45,000 and interest of \$2,133, on the Bellridge convertible notes had been converted into 94,266 shares of common stock and no cash payments of principal or interest had been made.

The conversion option associated with the notes was deemed to include an embedded derivative that required bifurcation and separate accounting. Refer to Note 12. Derivative Liabilities for further details.

On September 11, 2020, the Bellridge Convertible Notes were assigned to BD1 as part of the Company's recapitalization and restructuring effort which began in June 2020. The Company subsequently entered into an Exchange Agreement with BD1 on December 18, 2020. Refer to the *BD1 Convertible Notes* in Note 11. Convertible Notes for further discussion.

Power Up Convertible Notes

Prior to 2020, the Company had issued convertible notes to Power Up Lending Group, LTD ("Power Up"), which had remaining aggregate principal and accrued interest balances of \$106,820 and \$9,346, respectively, at January 1, 2020.

Beginning in six months after issuance, 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.

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.

The conversion option associated with the notes was deemed to include an embedded derivative that required bifurcation and separate accounting. Refer to Note 12. Derivative Liabilities for further details.

On September 11, 2020, the Power Up Convertible Notes were assigned to BD1 as part of the Company's recapitalization and restructuring effort which began in June 2020. The Company subsequently entered into an Exchange Agreement with BD1 on December 18, 2020. Refer to the *BD1 Convertible Notes* in Note 11. Convertible Notes for further discussion.

Widjaja Convertible Note

Prior to 2020, the Company had sold and issued a convertible note to Jason Widjaja ("Widjaja") which had remaining aggregate principal and accrued interest balances of \$330,000 and \$38,407, respectively, as of January 1, 2020. 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.

During 2020, no principal and no interest had been converted into shares of common stock and no cash payments of principal or interest had been made.

The conversion option associated with the note was deemed to include an embedded derivative that required bifurcation and separate accounting. Refer to Note 12. Derivative Liabilities for further details.

On September 11, 2020, the Widjaja Convertible Note was assigned to BD1 as part of the Company's recapitalization and restructuring effort which began in June 2020. The Company subsequently entered into an Exchange Agreement with BD1 on December 18, 2020. Refer to the *BD1 Convertible Notes* in Note 11. Convertible Notes for further discussion.

GS Capital Convertible Note

Prior to 2020, the Company had sold and issued convertible notes to GS Capital Partners, LLC (“GS”) which had remaining aggregate principal and accrued interest balances of \$169,500 and \$8,832, respectively, as of January 1, 2020.

These notes are unsecured, bear interest at 8% per annum, matures twelve months from the date of issuance, 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. There are no registration rights applicable to the note.

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 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 the Company's common stock.

The conversion option associated with the notes was deemed to include an embedded derivative that required bifurcation and separate accounting. Refer to Note 12. Derivative Liabilities for further details.

On September 11, 2020, the GS Convertible Note was assigned to BD1 as part of the Company's recapitalization and restructuring effort which began in June 2020. The Company subsequently entered into an Exchange Agreement with BD1 on December 18, 2020. Refer to the *BD1 Convertible Notes* in Note 11. Convertible Notes for further discussion.

Penumbra Convertible Note

On June 9, 2020, the Company issued to Penumbra Solar, Inc. (“Penumbra”) a \$250,000 aggregate principal amount convertible promissory note. The Company has received \$250,000 of gross proceeds from the offering of the note. The aggregate principal amount (together with accrued interest) will mature on June 9, 2021. The note bears interest at a rate of 6% per annum. The interest rate increases to 18% in the event of a default. The note is convertible, at the holder's option, into shares of the Company's Common Stock at a conversion price equal to \$0.50 per share.

On September 25, 2020, the Penumbra Convertible Note was assigned to Crowdex.

Crowdex Convertible Note

On September 25, 2020, as discussed above, Penumbra assigned its note to Crowdex. At December 31, 2020, the note had a principal balance of \$250,000 and an accrued interest balance of \$8,425. The aggregate principal amount (together with accrued interest) will mature on June 9, 2021. The note bears an interest rate of 6% per annum. The interest rate increases to 18% in the event of a default. The note is convertible, at the holder's option, into shares of the Company's Common Stock at a conversion price equal to \$0.50 per share. On December 9, 2021, Crowdex converted its aggregate principal and accrued interest totaling \$272,521 into 545,041 shares of common stock.

BD1 Convertible Note

During September 2020, a number of the Company's investors entered into assignment agreements to sell their existing debt to BD1. Refer to Notes 9, 10, and 11, for more information. The assignments did not change the terms of the notes, and transferred ownership of the following debts:

	Principal Converted	Interest Converted	Footnote Reference
St George	\$ 2,160,000	\$ 417,000	Note 9
Investor 1	495,000	187,000	Note 10
Investor 2	650,000	86,000	Note 10
October 2016 Note	330,000	79,000	Note 11
St George	618,000	—	Note 11
Baybridge	941,000	152,000	Note 11
Bellridge	451,000	121,000	Note 11
Power Up	107,000	16,000	Note 11
Widjaja	330,000	68,000	Note 11
GS Capital	170,000	19,000	Note 11
Total	\$ 6,252,000	\$ 1,145,000	

On December 18, 2020, the Company entered into a securities exchange agreement ("BD1 Exchange Agreement") with BD1, who had previously acquired all of the Company's existing outstanding unsecured notes (other than notes held by GI and Crowdex) from the original note holders as listed above.

Pursuant to the terms of the BD1 Exchange Agreement, BD1 agreed to surrender and exchange all of its outstanding promissory notes with principal balances of approximately \$10.4 million (including accrued interest and default penalties). In exchange, the Company issued to BD1 two unsecured convertible notes with an aggregate principal amount of \$10,500,000 ("BD1 Exchange Notes"). The BD1 Exchange Notes do not bear any interest, and will mature on December 18, 2025. BD1 has the right, at any time until the BD1 Exchange Notes are fully paid, to convert any outstanding and unpaid principal into shares of Common Stock at a fixed conversion price equal to \$0.50 per share. Accordingly, the Company would issue 21,000,000 shares of Common Stock upon a full conversion of the BD1 Exchange Notes.

On August 13, 2021, BD1 assigned \$600,000 of its outstanding principal balance to Nanyang Investment Management Pte Ltd ("Nanyang"). As of December 31, 2021, BD1 held notes with an aggregate principal amount of \$9,900,000 convertible to 19,800,000 shares of common stock.

Nanyang Convertible Note

On August 13, 2021, as discussed above, BD1 assigned \$600,000 of the BD1 Exchange Notes to Nanyang. This note does not bear any interest and will mature on December 18, 2025. Nanyang has the right, at any time until the note is fully paid, to convert any outstanding and unpaid principal into share of common stock at a fixed conversion price equal to \$0.50 per share. Accordingly, the Company would issue 1,200,000 common shares upon full conversion of this note. Shares of common stock may not be issued pursuant to this note if, after giving effect to the conversion or issuance, Nanyang, together with its affiliates, would beneficially own in excess of 4.99% of the outstanding shares of the Company's common stock.

On October 13, 2021, \$100,000 of Nanyang's convertible notes were converted into 200,000 shares of common stock. As of December 31, 2021, Nanyang held notes with an aggregate principal amount of \$500,000 convertible to 1,000,000 shares of common stock.

NOTE 12. DERIVATIVE LIABILITIES

The following table is a summary of the derivative liability activity for the years ended December 31, 2021 and 2020:

Derivative Liability Balance as of January 1, 2020	\$ 7,717,150
Additional derivative liability on new notes	447,903
Change in fair value of derivative liability	(2,861,069)
Derivative Liability Balance as of December 31, 2020	5,303,984
Liability extinguished	(5,303,984)
Derivative Liability Balance as of December 31, 2021	\$ —

Convertible Notes Assigned to BD1

The convertible notes that were assigned to BD1 in September 2020, further described above in Notes 10 and 11, were exchanged for new notes as part of the Company's recapitalization and restructuring effort which began in June 2020. Prior to the exchange, pursuant to a number of factors outlined in ASC Topic 815, *Derivatives and Hedging*, the conversion options 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.

At January 1, 2020, the aggregate derivative liability associated with these notes was \$5,706,175. This value was derived from Management's fair value assessment using the following assumptions: annual volatility range of 42% to 46%, present value discount rate of 12%, and a dividend yield of 0%.

During the first three quarters of 2020, pursuant to ASC Topic 815, *Derivatives and Hedging*, Management conducted quarterly fair value assessments of the embedded derivatives associated with these notes. Engaging the services of a firm specializing in these valuations, it was determined that a rational investor would not convert the notes, and would not expect to do so in the foreseeable future. The Company had reported doubt as to its ability to continue as a going concern since 2015. The Company scaled down operations and did not expect to ramp up until significant financing could be obtained and had been operating under these conditions for some time already, continuously chasing funding to continue operations. Circumstances shifted in late 2019 and early 2020, making fundraising and continuing operations more difficult, thereby reducing liquidity and attractiveness of the common stock. These new circumstances made it clear to current and prospective investors that the Company would either file bankruptcy or restructure with a strategic investor. Accordingly, as of the valuation date, conversion of a debt instrument into common stock that cannot be sold in the marketplace would put the holder in a far less secure position compared to holding the instrument as debt. As a result of the fair value assessments, the Company recorded an aggregate net gain of \$5,706,175 for the year ended December 31, 2020, as "Change in fair value of derivatives and gain/loss on extinguishment of liabilities, net" in the Consolidated Statements of Operations to properly reflect that the value of the embedded derivative had been eliminated in 2020.

Convertible Notes held by Global Ichiban

In connection with the convertible notes held by Global, further described above in Note 9, pursuant to a number of factors outlined in ASC Topic 815, *Derivatives and Hedging*, the conversion options 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.

At January 1, 2020, the aggregate derivative liability associated with these notes was \$2,010,975. This value was derived from Management's fair value assessment using the following assumptions: annual volatility of 46%, present value discount rate of 12%, and a dividend yield of 0%.

The conversion option in the GI 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 based on the following assumptions: annual volatility of 49%, expected interest rate of 1.52%, and a dividend yield of 0%, and appropriately recorded that value as a derivative liability. At September 9, 2020, the derivative liability associated with the Global note was \$447,903. The fair value of the derivative was recorded as a debt discount and will be charged to interest over the life of the note.

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. Management assessed the fair value option of this embedded derivative, as of December 31, 2020, using the following assumptions: annual volatility of 62%, and a dividend yield of 0%. As a result of the fair value assessments, the Company recorded an aggregate net loss of \$2,845,106 for the year ended December 31, 2020, as “Change in fair value of derivatives and gain/loss on extinguishment of liabilities, net” in the Consolidated Statement of Operations to properly reflect that the value of the embedded derivative of \$5,303,984 as of December 31, 2020.

On March 9, 2021, the Company entered into a settlement agreement with Global, further described above in Note 8. As a result of the settlement, the entire debt was cancelled and the Company recorded an aggregate net gain of \$5,303,984 as “Change in fair value of derivatives and gain/loss on extinguishment of liabilities, net” in the Consolidated Statement of Operations to properly reflect that the value of the embedded derivative had been eliminated.

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 \$6.0 million. 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 \$1.0 million. The final closings took place in August 2013, with the transfer of 625,000 shares of Series A Preferred Stock.

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 \$1,160,000, 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, 2021, 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 11) for outstanding shares of Series A Preferred Stock from the Series A Holder.

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 \$8.00 per share of Series A Preferred Stock plus any accrued and unpaid dividends.

As of December 31, 2021, there were 48,100 shares of Series A Preferred Stock outstanding and accrued and unpaid dividends of \$416,733.

NOTE 14. SERIES 1A PREFERRED STOCK

Series 1A Preferred Stock – Tranche 1 Closing

On September 22, 2020, the Company entered into a securities purchase agreement (“Series 1A SPA”) with Crowdex, for the private placement of up to \$5,000,000 of the Company’s newly designated Series 1A Convertible Preferred Stock (“Series 1A Preferred Stock”).

Each share of Series 1A Preferred Stock has an original issue price of \$1,000 per share. Shares of the Series 1A Preferred Stock are convertible into common stock at a fixed conversion price equal to \$0.50 per common share, subject to standard ratable anti-dilution adjustments.

Outstanding shares of Series 1A Preferred Stock are entitled to vote together with the holders of common stock as a single class (on an as-converted to common stock basis) on any matter presented to the stockholders of the Company for their action or consideration at any meeting of stock holders (or written consent of stockholders in lieu of meeting).

Holders of the Series 1A Preferred Stock are not entitled to any fixed rate of dividends. If the Company pays a dividend or otherwise makes a distribution payable on shares of common stock, holders of the Series 1A Preferred Stock will receive such dividend or distribution on an as-converted to common stock basis. There are no specified redemption rights for the Series 1A Preferred Stock. Upon liquidation, dissolution or winding up, holders of Series 1A Preferred Stock will be entitled to be paid out of the Company’s assets, prior to the holders of our common stock, an amount equal to \$1,000 per share plus any accrued but unpaid dividends (if any) thereon.

The Company sold 2,000 shares of Series 1A Preferred Stock to Crowdex in exchange for \$2,000,000 of gross proceeds at an initial closing under the Series 1A SPA on September 22, 2020.

In November 2020, Crowdex converted 1,200 shares of outstanding Series 1A Preferred Stock into 2,400,000 shares of common stock.

On December 31, 2020 the Company sold 500 shares of Series 1A Preferred Stock to Crowdex in exchange for the cancellation of the Crowdex Note issued on November 27, 2020. There were no additional cash proceeds from this closing.

On January 4, 2021, the Company entered into a securities purchase agreement (“Series 1A Tranche 2 SPA”) with TubeSolar. Pursuant to the Series 1A Tranche 2 SPA, the Company sold 2,500 shares of Series 1A Preferred Stock to TubeSolar and received \$2,500,000 of gross proceeds on January 5, 2021. During the year ended December 31, 2021, TubeSolar converted 100 shares of Series 1A Preferred Stock into 200,000 shares of common stock.

NOTE 15. STOCKHOLDERS’ EQUITY (DEFICIT)

Common Stock

At, the Company had 500 million 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, 2021, the Company had 4,786,804 shares of common stock outstanding. The Company has not declared or paid any dividends related to the common stock through December 31, 2021.

On March 4, 2021, Baybridge purchased 15,000 shares of the Company’s common stock for an aggregate purchase price of \$3,000,000.

On August 2, 2021, the Company entered into a common stock purchase agreement (“Common Stock SPA”) with BD1 for the placement of 133,333 shares of the Company’s common stock for an aggregate purchase price of \$10,000,000. The first tranche of 66,667 shares for \$5,000,000 closed on September 2, 2021 and the second tranche closed on November 5, 2021.

Preferred Stock

At December 31, 2020, 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:

Preferred Stock Series Designation	Shares Authorized	Shares Outstanding
Series A	750,000	48,100
Series 1A	5,000	3,700
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 1A Preferred Stock

Refer to Note 14 for Series 1A Preferred Stock activity.

Series B-1, B-2, C, D, D-1, E, F, G, H, I, J, J-1, and K Preferred Stock

There were no transactions involving the Series B-1, B-2, C, D, D-1, E, G, H, I, J, J-1, or K during the years ended December 31, 2021 and 2020.

NOTE 16. INCOME TAXES

The Company records 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.

At December 31, 2021, the Company had \$233.6 million of cumulative net operating loss carryforwards for federal income tax purposes that were available to offset future taxable income through the year 2037. At December 31, 2021, the Company had \$64.8 million of cumulative net operating loss carryforwards for federal income tax purposes that were available to offset future taxable income indefinitely. 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 \$298.4 million for the year ended December 31, 2021. 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, 2021 and 2020, the components of these temporary differences and the deferred tax asset were as follows:

	As of December 31,	
	2021	2020
Deferred Tax Asset		
Accrued Expenses	\$ 104,000	\$ 22,000
Inventory Allowance	98,000	137,000
Other	5,000	10,000
Operating Lease Liability	1,280,000	1,183,000
Tax effect of NOL carryforward	74,167,000	72,307,000
Depreciation	596,000	355,000
Warranty reserve	5,000	3,000
Gross Deferred Tax Asset	76,255,000	74,017,000
Valuation Allowance	(75,003,000)	(72,555,000)
Net Deferred Tax Asset	\$ 1,252,000	\$ 1,462,000
Operating lease right-of-use asset, net	(1,231,000)	(1,287,000)
Amortization	(21,000)	(175,000)
Net Deferred Tax Liability	\$ (1,252,000)	\$ (1,462,000)
Total	—	—

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, 2021. The Company's deferred tax valuation allowance of \$75.0 million reflected above is an increase of \$2.4 million from the valuation allowance reflected as of December 31, 2020 of \$72.6 million.

As of December 31, 2021, 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, 2021.

The Company's effective tax rate for the years ended December 31, 2021 and 2020 differs from the statutory rate due to the following (expressed as a percentage of pre-tax income):

	2021	2020
Federal statutory rate	21.0 %	21.0 %
State statutory rate	5.4 %	6.9 %
Permanent tax differences	(3.9) %	3.7 %
Derivative/Warrant Revaluation	— %	(30.9) %
Debt Discount	12.7 %	1.6 %
Deferred true-ups	4.9 %	48.9 %
Other	0.7 %	— %
Change in valuation allowance	(40.8) %	(51.2) %
	— %	— %

NOTE 17. COMMITMENTS AND CONTINGENCIES

In May 2019, the Company's former law firm filed suit against the Company in District Court in Adams County Colorado in an effort to collect approximately \$1.2 million of unpaid fees (and related interest charges). On September 11, 2020, the Company entered into a settlement agreement (the "Settlement Agreement") with its former law firm. Pursuant to the Settlement Agreement, the Company paid \$120,000 on September 23, 2020 as the full and final settlement of all amounts owed between the parties. Following such payment, a satisfaction of an existing judgment in favor of such law firm was filed in Adams County Colorado.

On July 29, 2020, the Company's owned facility at 12300 Grant Street, Thornton, CO 80241 (the "Building") was foreclosed by the Building's first lien holder ("Mortgage Holder") and sold at public auction. The successful bidder for the Building was the Mortgage Holder, at the price of \$7.193 million. As a result, the Company's obligations to Mortgage Holder and all of the Company's outstanding real property taxes on the Building were considered fully repaid.

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 18. 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 four 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. Employer 401(k) match expense was \$31,423 and 0 for the year ended December 31, 2021 and 2020, respectively. 401(k) match expenses are recorded under "Research, development and manufacturing operations" expense and "Selling, general and administrative" expense in the Consolidated Statements of Operations.

NOTE 19. SUBSEQUENT EVENTS

Below is the sequence of events subsequent to December 31, 2021 through the Audit Report date of March 14, 2022:

Reverse Stock Split

On January 28, 2022 as of 5:00 pm Eastern Time, the Company effected a 1:5,000 reverse stock split of the Company's common stock, par value \$0.0001 per share. The Company's common stock began trading on a split-adjusted basis as of 9:30 am Eastern Time on January 31, 2022.

BD1 Convertible Notes

On January 3, 2022, BD1 sold and assigned \$1,000,000 of its convertible notes to Fleur Capital Pte Ltd ("Fleur"). On January 21, 2022, BD1 sold and assigned \$1,000,000 of its convertible notes to Nanyang. The aggregate remaining principal balance held by BD1 after these assignments was \$7,900,000. On February 1, 2022, BD1 converted its \$7,900,000 aggregate outstanding principal amount into 15,800,000 shares of common stock.

Series 1A Preferred Stock

On February 1, 2022:

- Crowdex converted their remaining 1,300 shares of Series 1A Preferred Stock into 2,600,000 shares of common stock.
- TubeSolar converted their remaining 2,400 shares of Series 1A Preferred Stock into 4,800,000 shares of common stock.

Convertible Notes

On February 2, 2022:

- Nanyang converted \$600,000 of their convertible notes into 1,200,000 shares of common stock.
- Fleur converted \$700,000 of their convertible notes into 1,400,000 shares of common stock.

**DESCRIPTION OF THE REGISTRANT'S COMMON STOCK
REGISTERED PURSUANT TO SECTION 12 OF THE
SECURITIES AND EXCHANGE ACT OF 1934, AS AMENDED**

The common stock of Ascent Solar Technologies, Inc. is registered under Section 12 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"). Our shares of common stock are traded on the OTC stock market under the trading symbol "ASTI."

The following summary describes our common stock and the material provisions of our certificate of incorporation, our bylaws, and of the Delaware General Corporation Law (the "DGCL"). Because the following is only a summary, it does not contain all of the information that may be important to you. For a complete description, you should refer to our certificate of incorporation and bylaws filed as exhibits to our Annual Report on Form 10-K filed with the Securities Exchange Commission, of which this Exhibit 4.3 is a part. We encourage you to read those documents and the DGCL carefully.

Authorized Capital Stock

Our authorized capital stock consists of 500,000,000 shares of common stock, par value \$0.0001 per share, and 25,000,000 shares of preferred stock, par value \$0.0001 per share.

The authorized but unissued shares of common and preferred stock are available for future issuance without stockholder approval, unless otherwise required by law or applicable stock exchange rules. Additional authorized but unissued shares may be used for a variety of corporate purposes, including future public offerings to raise additional capital, corporate acquisitions and employee benefit plans. The existence of authorized but unissued shares could hinder or discourage an attempt to obtain control of us by means of a proxy contest, tender offer, merger or otherwise.

Outstanding Capital Stock

As of March 11, 2022, the Company had issued and outstanding:

- 30,586,804 shares of common stock;
- 48,100 shares of Series A preferred stock; and
- no shares of Series 1A, Series B-1, Series B-2, Series C, Series D, Series D-1, Series E, Series F, Series G, Series H, Series I, Series J, Series J-1 or Series K preferred stock.

Common Stock

The holders of our common stock are entitled to one vote for each share held on all matters submitted to a vote of the stockholders. The holders of our common stock do not have any cumulative voting rights. Holders of our common stock are entitled to receive ratably any dividends declared by our board of directors out of funds legally available for that purpose, subject to any preferential dividend rights of any outstanding preferred stock. Our common stock has no preemptive rights, conversion rights or other subscription rights or redemption or sinking fund provisions.

In the event of our liquidation, dissolution or winding up, holders of our common stock will be entitled to share ratably in all assets remaining after payment of all debts and other liabilities and any liquidation preference of any outstanding preferred stock. Each outstanding share of common stock is duly and validly issued, fully paid and non-assessable.

Preferred Stock

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

The issuance of shares of preferred stock, or the issuance of rights to purchase such shares, could be used to discourage an unsolicited acquisition proposal. For instance, the issuance of a series of preferred stock might impede a business combination by including class voting rights that would enable a holder to block such a transaction. In addition, under certain circumstances, the issuance of preferred stock could adversely affect the voting power of holders of our common stock. Although our board is required to make any determination to issue preferred stock based on its judgment as to the best interests of our stockholders, our board could act in a manner that would discourage an acquisition attempt or other transaction that some, or a majority, of our stockholders might believe to be in their best interests or in which such stockholders might receive a premium for their stock over the then market price of such stock.

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

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

Board Composition; Removal of Directors and Filling Board Vacancies

Our charter provides that stockholders may remove directors only for cause and only by the affirmative vote of the holders of at least a majority of the shares entitled to vote at an election of directors.

Our bylaws authorize only our board of directors to fill vacant directorships, including newly created seats. In addition, the number of directors constituting our board of directors may only be set by a resolution adopted by a majority vote of our entire board of directors. These provisions would prevent a stockholder from increasing the size of our board of directors and then gaining control of our board of directors by filling the resulting vacancies with its own nominees. This makes it more difficult to change the composition of our board of directors but promotes continuity of management.

Staggered Board

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

Advance Notice Requirements

Our bylaws provide advance notice procedures for stockholders seeking to bring matters before our annual meeting of stockholders or to nominate candidates for election as directors at our annual meeting of stockholders. Our bylaws also specify certain requirements regarding the form and content of a stockholder's notice. These provisions might preclude our stockholders from bringing matters before our annual meeting of stockholders or from making nominations for directors at our annual meeting of stockholders if the proper procedures are not followed. We expect that these provisions might also discourage or deter a potential acquirer from conducting a solicitation of proxies to elect the acquirer's own slate of directors or otherwise attempting to obtain control of our company.

Special Meetings

Our bylaws provide that special meetings of stockholders may only be called at the request of a majority of the board, and only those matters set forth in the notice of the special meeting may be considered or acted upon at a special meeting of stockholders.

Undesignated Preferred Stock

Our charter provides for 25,000,000 authorized shares of preferred stock. The existence of authorized but unissued shares of preferred stock may enable our board to discourage an attempt to obtain control of us by means of a merger, tender offer, proxy contest or otherwise. For example, if in the due exercise of its fiduciary obligations, our board of directors were to determine that a takeover proposal is not in the best interests of our stockholders, our board could cause shares of convertible preferred stock to be issued without stockholder approval in one or more private offerings or other transactions that might dilute the voting or other rights of the proposed acquirer or insurgent stockholder or stockholder group. In this regard, our

charter grants our board broad power to establish the rights and preferences of authorized and unissued shares of preferred stock. The issuance of shares of preferred stock could decrease the amount of earnings and assets available for distribution to holders of shares of common stock. The issuance may also adversely affect the rights and powers, including voting rights, of these holders and may have the effect of delaying, deterring or preventing a change in control of us.

Delaware Anti-Takeover Statute

We are subject to the provisions of Section 203 of the DGCL. In general, Section 203 prohibits a publicly held Delaware corporation from engaging in a “business combination” with an “interested stockholder” for a three-year period following the time that this stockholder becomes an interested stockholder, unless the business combination is approved in a prescribed manner. Under Section 203, a business combination between a corporation and an interested stockholder is prohibited unless it satisfies one of the following conditions:

- before the stockholder became interested, our board approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
- upon consummation of the transaction which resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the voting stock outstanding, shares owned by persons who are directors and also officers, and employee stock plans, in some instances, but not the outstanding voting stock owned by the interested stockholder; or
- at or after the time the stockholder became interested, the business combination was approved by our board and authorized at an annual or special meeting of the stockholders by the affirmative vote of at least two-thirds of the outstanding voting stock which is not owned by the interested stockholder.

Section 203 defines a business combination to include:

- any merger or consolidation involving the corporation and the interested stockholder;
- any sale, transfer, lease, pledge, exchange, mortgage or other disposition involving the interested stockholder of 10% or more of the assets of the corporation;
- subject to exceptions, any transaction that results in the issuance or transfer by the corporation of any stock of the corporation to the interested stockholder; or
- the receipt by the interested stockholder of the benefit of any loans, advances, guarantees, pledges or other financial benefits provided by or through the corporation.

In general, Section 203 defines an interested stockholder as any entity or person beneficially owning 15% or more of the outstanding voting stock of the corporation and any entity or person affiliated with or controlling or controlled by the entity or person.

Transfer Agent and Registrar

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

THIS PROMISSORY NOTE HAS NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED, OR APPLICABLE STATE SECURITIES LAWS. THE SECURITIES MAY NOT BE OFFERED FOR SALE, SOLD, TRANSFERRED OR ASSIGNED (I) IN THE ABSENCE OF (A) AN EFFECTIVE REGISTRATION STATEMENT FOR THE SECURITIES UNDER THE SECURITIES ACT OF 1933, AS AMENDED, OR (B) AN OPINION OF COUNSEL (WHICH COUNSEL SHALL BE SELECTED BY THE HOLDER), IN A GENERALLY ACCEPTABLE FORM, THAT REGISTRATION IS NOT REQUIRED UNDER SAID ACT OR (II) UNLESS SOLD PURSUANT TO RULE 144 OR RULE 144A UNDER SAID ACT. NOTWITHSTANDING THE FOREGOING, THE SECURITIES MAY BE PLEDGED IN CONNECTION WITH A BONA FIDE MARGIN ACCOUNT OR OTHER LOAN OR FINANCING ARRANGEMENT SECURED BY THE SECURITIES.

Remaining Principal Amount: \$1,000,000.00

Original Issue Date: December 18, 2020
Replacement Note Issue Date: January 3, 2022

UNSECURED CONVERTIBLE PROMISSORY NOTE

FOR VALUE RECEIVED, ASCENT SOLAR TECHNOLOGIES, INC., a Delaware corporation (hereinafter called “**Borrower**”), hereby promises to pay to Fleur Capital (S) Pte Ltd, a Singapore incorporation company in its capacity as manager, for and on behalf of clients accounts, or its assigns (the “**Holder**” and together with the Borrower, the “**Parties**”) or order, without demand, the sum of One Million Dollars (\$1,000,000.00) (“**Principal Amount**”), without accrued interest on the unpaid principal balance hereof and maturing on December 18, 2025 (the “**Maturity Date**”) together with fees incurred or other amounts owing hereunder, all as set forth below in this Promissory Note (this “**Note**” or this “**Agreement**”), if not sooner paid. All payments due hereunder (to the extent not converted into the Borrower’s common stock, \$.0001 par value per share (the “**Common Stock**”) in accordance with the terms hereof) shall be made in Common Stock equal to the Conversion Price as stipulated in Clause 2.1(b) and such payments shall be applied to amounts owing under the Note by Holder, in its sole discretion.

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 GENERAL PROVISIONS

1.1 Payment Grace Period. The Borrower shall have a five (5) day grace period to pay any monetary amounts due under this Note, after which grace period a default interest rate of ten percent (10%) per annum shall apply from the due date thereof until the same is paid (“**Default Interest**”).

1.2 Original Issue Discount. The Borrower acknowledges that the Principal Amount of this Note exceeds the Purchase Price for this Note and that such excess is an original issue discount and shall be fully earned and charged to the Borrower upon the execution of this Note, and shall be paid to the Holder as part of the outstanding principal balance as set forth in this Note.

1.3 Application of Payments. The Borrower acknowledges that the payments made in connection with this Note shall be applied first to collection expenses (including all attorneys’ fees and expenses), if any, thereafter to amounts due hereunder other than principal and interest, thereafter to accrued and unpaid interest (if any) and finally to Principal Amount all in the Holder’s sole discretion.

1.4 Change of Control. In the event of (i) any transaction or series of related transactions (including any reorganization, merger or consolidation) by an individual or legal entity or “group” (as described in Rule 13d-5(b)(1) promulgated under the Exchange Act (as defined below)) of effective control (whether through legal or beneficial ownership of capital stock of the Borrower, by contract or otherwise) that results in the transfer of 33% or more of the outstanding voting power of the Borrower, (ii) the Borrower merges into or consolidates with any other Person, or any Person merges into or consolidates with the Borrower and, after giving effect to such transaction, the stockholders of the Borrower immediately prior to such transaction own less than 66% of the aggregate voting power of the Borrower or the successor entity of such transaction, or (iii) a sale of all or substantially all of the assets of the Borrower to another person or entity ((i), (ii) and (iii) together, a “**Change of Control**”), this Note shall be automatically due and payable in full, immediately. The Borrower will give the Holder not less than twenty (20) business days prior written notice of the occurrence of any events referred to in this Section 1.4. The Holder acknowledges that the capital raising and restructuring transactions that are occurring on or about the date of this Note shall not be considered a Change of Control.

1.5 Exchange and Exchange Agreement. This Note (in the original principal amount of \$10,340,000.00) and a related note (in the principal amount of \$160,000.00) were issued pursuant to an exchange agreement between the Borrower and the original holder dated December 18, 2020 (the “**Exchange Agreement**”). This Note is being issued in partial replacement of the original \$10.34 million Note following an assignment of a \$1,000,000 portion by the original holder to the Holder on the date hereof.

1.6 Miscellaneous. The Default Interest on this Note shall be calculated on the basis of a 365-day year and the actual number of days elapsed. Principal and interest on this Note and other payments in connection with this Note shall be payable at the Holder’s offices as designated in lawful money of the United States of America in immediately available funds without set-off, deduction or counterclaim. Upon assignment of the interest of Holder in this Note, Borrower shall instead make its payment pursuant to the assignee’s instructions upon receipt of written notice thereof.

ARTICLE II OPTIONAL CONVERSION

The Holder, in its sole option, shall have the right to convert the principal due under this Note into Shares of the Borrower’s Common Stock as set forth below.

2.1 Conversion into the Borrower’s Common Stock.

(a) **Conversion Right.** At the Holder’s sole discretion, the Holder shall have the right from and after the date of the issuance of this Note and then at any time until this Note is fully paid, to convert any outstanding and unpaid principal portion of this Note at the election of the Holder (the date of giving of such notice of conversion in accordance with Section 2.3(a) being a “**Conversion Date**”) into fully paid and nonassessable shares of Common Stock as such stock exists on the date of issuance of this Note, or any shares of capital stock of Borrower into which such Common Stock shall hereafter be changed or reclassified, at the conversion price as defined in Section 2.1(b) hereof (the “**Conversion Price**”), determined as provided herein.

Upon delivery to the Borrower of a completed notice of conversion, a form of which is annexed hereto as Exhibit A (the “**Notice of Conversion**”), Borrower shall issue and deliver to the Holder within three (3) business days after the Conversion Date (such third day being the “**Delivery Date**”) that number of shares of Common Stock for the portion of the Note converted in accordance with the foregoing. At the election of the Holder, the Borrower will deliver accrued but unpaid interest on the Note, if any, through the Conversion Date directly to the Holder on or before the Delivery Date. The number of shares of Common Stock to be issued upon each conversion of this Note shall be determined by dividing that portion of the principal of the Note and interest, if any, to be converted, by the Conversion Price. To effect conversions hereunder, the Holder shall not be required to physically surrender this Note to the Borrower unless the entire principal amount of this Note, plus all accrued and unpaid interest thereon, has been so converted. Conversions hereunder shall have the effect of lowering the outstanding principal amount of this Note in an amount equal to the applicable conversion listed on the Notice of Conversion. The Holder and the Borrower shall maintain records showing the principal amount(s) converted and the date of such conversion(s). In the event of any dispute or discrepancy, the records of the Holder shall be controlling and determinative in the absence of manifest error.

(b) **Conversion Price.** Subject to adjustment as provided in Section 2.1(c) hereof, the conversion price per share shall be equal to \$0.0001 (“**Conversion Price**”). The Conversion Price may be adjusted pursuant to the other terms of this Note.

(c) **Effect of Certain Events.** The Conversion Price and number and kind of shares or other securities to be issued upon conversion determined pursuant to Section 2.1(a), shall be subject to adjustment from time to time upon the happening of certain events while this conversion right remains outstanding, as follows:

A. **Reclassification, etc.** If the Borrower at any time shall, by reclassification or otherwise, change the Common Stock into the same or a different number of securities of any class or classes that may be issued or outstanding, this Note, as to the unpaid principal portion thereof, shall thereafter be deemed to evidence the right to purchase an adjusted number of such securities and kind of securities as would have been issuable as the result of such change with respect to the Common Stock immediately prior to such reclassification or other change.

B. **Stock Splits, Combinations and Dividends.** If the shares of Common Stock are subdivided or combined into a greater or smaller number of shares of Common Stock, or if a dividend is paid on the Common Stock in shares of Common Stock, the Conversion Price shall be proportionately reduced in case of subdivision of shares or stock dividend or proportionately increased in the case of combination of shares, in each such case by the ratio which the total number of shares of Common Stock outstanding immediately after such event bears to the total number of shares of Common Stock outstanding immediately prior to such event.

(d) **Notice of Adjustments.** Whenever the Conversion Price is adjusted pursuant to Section 2.1(c) above, the Borrower shall promptly mail to the Holder a notice setting forth the Conversion Price after such adjustment and setting forth a statement of the facts requiring such adjustment. The Borrower shall, upon the written request at any time of the Holder, furnish to such Holder a like certificate setting forth (i) such adjustment or readjustment, (ii) the Conversion Price at the time in effect and (iii) the number of shares of Common Stock and the amount, if any, of other securities or property which at the time would be received upon conversion of the Note at the sole expense of the Borrower.

(e) **Further Adjustments.** In case at any time or, from time to time, the Borrower shall take any action that affects the Common Stock or other class of securities into which this Note may be converted under Article II, other than an action described herein, then, unless such action will not have a material adverse effect upon the rights of the Holder, the number of shares of such class of Common Stock (or other securities) into which this Note is convertible shall be adjusted in such a manner and at such time as shall be equitable under the circumstances.

(f) **Voluntary Adjustments.** The Borrower may at any time during the term of this Note reduce the then current Conversion Price to any amount and for any period of time deemed appropriate by the Board of Directors of the Borrower.

2.2 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. **Method of Conversion.** This Note may be converted by the Holder in whole or in part as described in Section 2.1(a) hereof. Upon partial conversion of this Note, a new Note containing the same date and provisions of this Note shall, at the request of the Holder, be issued by the Borrower to the Holder for the principal balance of this Note and interest which shall not have been converted or paid.

(a) **Mechanics of Conversion.** 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 copy of an executed Notice of Conversion in the form attached hereto as Exhibit A (via facsimile, electronic mail (email) or other reasonable means of communication dispatched on the Conversion Date on or prior to 11:59 p.m., New York, New York time). The Conversion Date specified in the Notice of Conversion shall be the Conversion Date so long as the Notice of Conversion is received by the Borrower before 11:59 p.m., New York, New York time, on such date.

(b) **Borrower's Response.** Upon receipt by the Borrower of a copy of a Notice of Conversion, the Borrower shall as soon as practicable, but in no event later than two (2) business days after receipt of such Conversion Notice, send, via facsimile or electronic mail (email) (or otherwise deliver) a confirmation of receipt of such Conversion Notice (the "**Conversion Confirmation**") to the Holder indicating that the Borrower will process such Conversion Notice in accordance with the terms herein. In the event the Borrower fails to issue its Conversion Confirmation within said two (2) Business Day time period, the Holder shall have the absolute and irrevocable right and authority to deliver the fully executed Conversion Notice to the Borrower's transfer agent, and the Borrower's transfer agent shall issue the applicable shares of Common Stock specified in such Conversion Notice (the "**Conversion Shares**") to Holder as hereby provided. To effect conversions hereunder, the Holder shall not be required to physically surrender this Note to the Borrower unless the entire principal amount of this Note, plus all accrued and unpaid interest thereon and other sums due hereunder, has been so converted. Conversions hereunder shall have the effect of lowering the outstanding sums owing under this Note in an amount stated in each applicable conversion notice. The Holder and the Borrower shall maintain records showing the principal and/or interest amount(s) converted and the date of such conversion(s).

(c) **Delivery of Common Stock Upon Conversion.** Upon receipt by the Borrower from the Holder of a facsimile transmission (or other reasonable means of communication) of a Notice of Conversion meeting the requirements for conversion as provided in this Section 2.3, the Borrower shall issue and deliver or cause to be issued and delivered to or upon the order of the Holder the electronic transfer (as described in Section 2.3 (e) herein below) the Common Stock issuable upon such conversion within three (3) business days after such receipt (and, solely in the case of conversion of the entire unpaid principal amount hereof, surrender of this Note) (such fifth business day being hereinafter referred to as the "**Deadline**") in accordance with the terms hereof.

(d) **Obligation of Borrower to Deliver Common Stock Absolute.** Upon submission by the Holder to 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 under this Article II, 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 or inaction 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 or any violation or alleged violation of law by the Holder or any other person or entity, and irrespective of any other circumstance which might otherwise limit such obligation of the Borrower to the Holder in connection with such conversion.

(e) **Delivery of Common Stock by Electronic Transfer.** In lieu of delivering physical certificates representing the Common Stock issuable upon conversion, provided the Borrower's transfer agent is participating in the Depository Trust Company ("**DTC**") Fast Automated Securities Transfer ("**FAST**") program or any similar program hereafter adopted by DTC performing substantially the same function, upon request of the Holder and its compliance with the provisions contained in Section 2.1 and in this Section 2.3, the Borrower shall 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 Withdrawal Agent Commission ("**DWAC**") system.

(f) **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 more than two (2) business days after the Deadline the Borrower shall pay to the Holder \$1,000 per day in cash or stock under the terms of this Note, for each day beyond the Deadline that the Borrower fails to deliver such Common Stock. Such cash amount shall be paid to Holder by the fifth (5th) 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.

(g) **Rescindment of Conversion Notice.** 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 (A) the Borrower fails to respond to Holder with a Conversion Confirmation pursuant to Section 2.3(b), (B) the Borrower fails to deliver of the Common Stock issuable upon conversion of this Note is more than two (2) business days after the Deadline, (C) the Holder is unable to procure a legal opinion required to have the Common Stock issued unrestricted and/or deposited to sell for any reason related to the Borrower's standing with the Securities and Exchange Commission ("SEC") or FINRA, or any action or inaction by the Borrower, (D) the Holder is unable to deposit the Common Stock requested in the Conversion Notice for any reason related to the Borrower's standing with the SEC or FINRA, or any action or inaction by the Borrower, (E) if the Holder is informed by the Borrower that the Borrower does not have enough Common Stock authorized to satisfy the Conversion Notice, or (F) if OTC Markets, Inc. f/k/a "Pink Sheets" changes the Borrower's designation to 'Limited Information' (Yield), 'No Information' (Stop Sign), 'Caveat Emptor' (Skull and Crossbones), or 'OTC', 'Other OTC' or 'Grey Market' (Exclamation Mark Sign) on any day after the date of the Conversion Notice prior to delivery of such Common Stock, the Holder may, at the Holder's sole discretion, rescind or void the Conversion Notice ("Rescindment Notice") by notifying the Borrower in the same manner that a Conversion Notice is required to be delivered to the Borrower pursuant to the terms of this Note. If the Holder chooses to provide the Borrower a timely Rescindment Notice, the Borrower shall pay to the Holder \$2,000 per day in cash or stock under the terms of this Note, for each day that the Borrower was in violation of A-F in this Section 2.3(g) up until the day the Holder submits a Rescindment Notice to the Borrower. Such cash amount shall be paid to Holder by the fifth (5th) 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.

(h) **Transfer Taxes and Legal Opinions.** Without limitation, the issuance of certificates for shares of the Common Stock on conversion of this Note shall be made without charge to the Holder hereof for any legal opinion fees, documentary stamp or similar taxes, or any other issuance or transfer fees of any nature or kind that may be payable in respect of the issue or delivery of such certificates, any such taxes or fees, if payable, to be paid by the Borrower. The Borrower agrees, at the Borrower's sole expense, to provide the Holder with a valid and reasonably accepted legal opinion concerning the issuance of certificates for shares of the Common Stock on conversion of this Note. If the Holder is required to obtain a legal opinion, the Borrower shall reimburse the Holder \$2,000 which may be deducted from the principal received by the Conversion Notice.

2.3 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 Securities Act of 1933, as amended (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 or (iii) such shares are sold or transferred pursuant to Rule 144 under the Act (or a successor rule) ("**Rule 144**") or (iv) 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 2.4. Until such time as the shares of Common Stock issuable upon conversion of this Note have been registered under the Act or an exemption that permits removal of the legend, shall bear a legend substantially in the following form, as appropriate:

"THE SECURITIES REPRESENTED BY THIS CERTIFICATE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED. THE SECURITIES MAY NOT BE SOLD, TRANSFERRED OR ASSIGNED IN THE ABSENCE OF AN EFFECTIVE REGISTRATION STATEMENT FOR THE SECURITIES UNDER SAID ACT, OR AN OPINION OF COUNSEL IN FORM, SUBSTANCE AND SCOPE CUSTOMARY FOR OPINIONS OF COUNSEL IN COMPARABLE TRANSACTIONS, THAT REGISTRATION IS NOT REQUIRED UNDER SAID ACT UNLESS SOLD PURSUANT TO RULE 144 OR REGULATION S UNDER SAID ACT."

The legend set forth above shall be removed and the Borrower shall issue to the Holder a new certificate therefor free of any transfer legend if (i) the Borrower or its transfer agent shall have received 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 Common Stock may be made without registration under the Act and the shares are so sold or transferred, (ii) such Holder provides the Borrower or its transfer agent with reasonable assurances that the Common Stock issuable upon conversion of this Note (to the extent such securities are deemed to have been acquired on the same date) can be sold pursuant to Rule 144 without volume or manner-of-sale restrictions or current public information requirements as determined by the counsel to the Borrower as set forth in a written opinion letter to such effect and addressed to the Transfer Agent and the Holder, or (iii) 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 Rule 144 without any restriction as to the number of securities as of a particular date that can then be immediately sold. The Borrower acknowledges and agrees that the holding period of the Common Stock issuable upon conversion of this Note under Rule 144(d) shall be deemed to have commenced as of October 22, 2019 (the most recent issuance date of the Exchange Securities exchanged for this Note pursuant to the Exchange Agreement) and, accordingly, a failure to remove legends from Common Stock issuable upon conversion of this Note shall cause liquidated damages to accrue pursuant to Section 2.3 herein. In any event, and subject to compliance with applicable securities laws, the Holder may enter into lawful hedging transactions in the course of hedging the position it assumes and the Holder may also enter into lawful short positions or other derivative transactions relating to the Common Stock or other securities, or interests in the Common Stock or other securities, and deliver the Common Stock or other securities, or interests in the Common Stock, to close out its short or other positions or otherwise settle other transactions, or loan or pledge the Common Stock, or interests in the Common Stock, to third parties who in turn may dispose of the Common Stock.

2.4 Holder's Conversion Limitations. The Borrower shall not effect any conversion of this Note, and the Holder shall not have the right to convert any portion of this Note, to the extent that after giving effect to the conversion set forth on the applicable Notice of Conversion, the Holder (together with the Holder's Affiliates (such Persons, "Attribution Parties")) would beneficially own in excess of the Beneficial Ownership Limitation (as defined below). For purposes of the foregoing sentence, the number of shares of Common Stock beneficially owned by the Holder and its Affiliates and Attribution Parties shall include the number of shares of Common Stock issuable upon conversion of this Note with respect to which such determination is being made, but shall exclude the number of shares of Common Stock which are issuable upon

(a) conversion of the remaining, unconverted principal amount of this Note beneficially owned by the Holder or any of its Affiliates or Attribution Parties and (ii) exercise or conversion of the unexercised or unconverted portion of any other securities of the Borrower subject to a limitation on conversion or exercise analogous to the limitation contained herein beneficially owned by the Holder or any of its Affiliates or Attribution Parties. Except as set forth in the preceding sentence, for purposes of this Section 2.5, beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. To the extent that the limitation contained in this Section 2.5 applies, the determination of whether this Note is convertible (in relation to other securities owned by the Holder together with any Affiliates and Attribution Parties) and of which principal amount of this Note is convertible shall be in the sole discretion of the Holder, and the submission of a Notice of Conversion shall be deemed to be the Holder's determination of whether this Note may be converted (in relation to other securities owned by the Holder together with any Affiliates or Attribution Parties) and which principal amount of this Note is convertible, in each case subject to the Beneficial Ownership Limitation. To ensure compliance with this restriction, the Holder will be deemed to represent to the Borrower each time it delivers a Notice of Conversion that such Notice of Conversion has not violated the restrictions set forth in this paragraph and the Borrower shall have no obligation to verify or confirm the accuracy of such determination. In addition, a determination as to any group status as contemplated above shall be determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. For purposes of this Section 2.5, in determining the number of outstanding shares of Common Stock, the Holder may rely on the number of outstanding shares of Common Stock as stated in the most recent of the following: (i) the Borrower's most recent periodic or annual report filed with the Commission, as the case may be, (ii) a more recent public announcement by the Borrower, or (iii) a more recent written notice by the Borrower or the Borrower's transfer agent setting forth the number of shares of Common Stock outstanding. Upon the written or oral request of a Holder, the Borrower shall within two Trading Days confirm orally and in writing to the Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares

of Common Stock shall be determined after giving effect to the conversion or exercise of securities of the Borrower, including this Note, by the Holder or its Affiliates since the date as of which such number of outstanding shares of Common Stock was reported. The “Beneficial Ownership Limitation” shall be 4.99% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock issuable upon conversion of this Note held by the Holder. The Holder, upon notice to the Borrower, may increase or decrease the Beneficial Ownership Limitation provisions of this Section 2.5, provided that the Beneficial Ownership Limitation in no event exceeds 9.99% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock upon conversion of this Note held by the Holder and the Beneficial Ownership Limitation provisions of this Section 2.5 shall continue to apply. Any increase in the Beneficial Ownership Limitation will not be effective until the 61st day after such notice is delivered to the Borrower. The Beneficial Ownership Limitation provisions of this paragraph shall be construed and implemented in a manner other than in strict conformity with the terms of this Section 2.5 to correct this paragraph (or any portion hereof) which may be defective or inconsistent with the intended Beneficial Ownership Limitation contained herein or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitations contained in this paragraph shall apply to a successor holder of this Note.

2.5 Status as Shareholder. Upon submission of a Notice of Conversion by the Holder, (i) the shares covered thereby shall be deemed converted into shares of Common Stock and (ii) the Holder’s rights as a Holder of such converted portion of this Note shall cease and terminate, excepting only the right to receive certificates for such shares of Common Stock and to any remedies provided herein or otherwise available at law or in equity to such Holder because of a failure by the Borrower to comply with the terms of this Note or the Exchange Agreement. Notwithstanding the foregoing, if a Holder has not received certificates for all shares of Common Stock prior to the tenth (10th) business day after the expiration of the Deadline with respect to a conversion of any portion of this Note for any reason, then (unless the Holder otherwise elects to retain its status as a holder of Common Stock by so notifying the Borrower) the Holder shall regain the rights of a Holder of this Note with respect to such unconverted portions of this Note and the Borrower shall, as soon as practicable, return such unconverted Note to the Holder or, if the Note has not been surrendered, adjust its records to reflect that such portion of this Note has not been converted. In all cases, the Holder shall retain all of its rights and remedies including, without limitation, (i) the right to receive Default Interest and Default Amounts for any Event of Default and (ii) the right to have the Default Interest and Default Amounts added to the principal amount of this Note which shall be convertible into Common Stock in accordance with the terms of this Note.

ARTICLE III
REPRESENTATIONS AND WARRANTIES

3. Representations and Warranties of the Borrower. The Borrower hereby represents and warrants to the Holder that:

- (a) The Borrower's Common Stock is registered under Section 12(g) of the Securities Exchange Act of 1934 (the "**Exchange Act**");
- (b) The Borrower is subject to the reporting requirements of section 13 or 15(d) of the Exchange Act and has filed all required reports under section 13 or 15(d) of the Exchange Act during the 12 months prior to the date hereof (or for such shorter period that the issuer was required to file such reports);
- (c) **Regulatory Compliance.** Borrower is not an "investment company" or a company "controlled" by an "investment company" under the Investment Company Act of 1940, as amended. Borrower is not engaged as one of its important activities in extending credit for margin stock (under Regulations X, T and U of the Federal Reserve Board of Governors). Borrower has complied in all material respects with the Federal Fair Labor Standards Act. Neither Borrower nor any of its subsidiaries ("**Subsidiaries**") is a "holding company" or an "affiliate" of a "holding company" or a "subsidiary company" of a "holding company" as each term is defined and used in the Public Utility Holding Company Act of 2005. Borrower has not violated any laws, ordinances or rules, the violation of which could reasonably be expected to have a material adverse effect on its business. None of Borrower's or any of its Subsidiaries' properties or assets has been used by Borrower or any Subsidiary or, to the best of Borrower's knowledge, by previous Persons, in disposing, producing, storing, treating, or transporting any hazardous substance other than legally. Borrower and each of its Subsidiaries have obtained all consents, approvals and authorizations of, made all declarations or filings with, and given all notices to, all Governmental Authorities that are necessary to continue their respective businesses as currently conducted;
- (d) **Litigation.** There is no claim, legal action, suit, arbitration, investigation or other proceeding pending, or to the knowledge of the Borrower, threatened against or relating to the Borrower or its assets. Neither the Borrower nor any of its assets are subject to any outstanding judgment, order, writ, injunction or decree of any Governmental Authority. There is currently no investigation or review by any Governmental Authority with respect to the Borrower pending or, to the knowledge of the Borrower, threatened, nor has any Governmental Authority notified the Borrower of its intention to conduct the same;
- (e) **SEC Matters.** To the knowledge of the Borrower, neither the Borrower, nor any current or past officer or director of the Borrower has ever been sanctioned, disciplined, fined, and/or imprisoned for any violations of any securities laws of the United States or any other jurisdiction.

ARTICLE IV
CERTAIN COVENANTS

4.1 Exchange Listing, Existence. The Borrower shall make such filings, registrations or qualifications and take all other necessary action and will use its best efforts to obtain such consents, approvals and authorizations, if any, and satisfy all conditions that any stock exchange or the OTCBB (as defined below) may impose on the listing of the Common Stock and shall use its best efforts to obtain and maintain such listing continuously thereafter for so long as all or any of the principal amount of the Note remains outstanding. The Borrower shall maintain and preserve, and cause each of its Subsidiaries to maintain and preserve, its existence, rights and privileges, and become or remain, and cause each of its Subsidiaries to become or remain, duly qualified and in good standing in each jurisdiction in which the character of the properties owned or leased by it or in which the transaction of its business makes such qualification necessary.

4.2 No Integration. Neither the Borrower nor any of its affiliates (as defined in Rule 501(b) of Regulation D ("**Regulation D**") of the Act) has, directly or through any agent, sold, offered for sale, solicited offers to buy or otherwise negotiated in respect of, any security (as defined in the Securities Act), that is or will be integrated with the sale of the Note in a manner that would require registration of the Note under the Securities Act.

4.3 Shell Company Status. The Borrower is not now, and has not, prior to the date of this Note, been a “shell company” as such term is defined in Rule 12b-2 of the Exchange Act.

4.4 Public Information. The Borrower shall make such filings, registrations or qualifications and take all other necessary action and will use its best efforts to satisfy all conditions to be in compliance and satisfy the current public information requirement under Rule 144(c), more specifically with Rule 144(c)(1), and otherwise without restriction or limitation pursuant to Rule 144, and shall use its best efforts to obtain such listing on an and maintain such listing continuously thereafter for so long as all or any of the principal amount of the Note remains outstanding.

4.5 DTCC Eligibility. The Borrower shall make such filings, registrations or qualifications and take all other necessary action to remain DTCC-eligible and not have its eligibility revoked or “chilled” by the Depository Trust Company (“DTC”) or any similar program hereafter adopted performing substantially the same function.

4.6 Legal Action Notice. The Borrower shall promptly report of any legal actions pending or threatened in writing against Borrower or any of its Subsidiaries that could result in damages or costs to Borrower or any of its Subsidiaries of, individually or in the aggregate, Fifty Thousand Dollars (\$50,000) or more.

4.7 Other Financial Information. The Borrower shall deliver budgets, sales projections, operating plans and other financial information reasonably requested by the Holder.

4.8 Change in Nature of Business. So long as the Borrower shall have any obligation under this Note, the Borrower shall not make, or permit any of its Subsidiaries to make, any material change in the nature of its business as described in the Borrower’s most recent annual report filed on Form 10-K with the SEC. The Borrower shall not modify its corporate structure or purpose.

4.9 Statutory Disqualification. So long as the Borrower shall have any obligation under this Note, the Borrower nor any of its officers, directors, controlling persons, employees, representatives, agents, affiliates, or any other person working for or on behalf of the Borrower is or shall be subject to statutory disqualification as defined in Section 3(a)(39) of the Exchange Act, as amended or Rule 506(d) under the Act.

ARTICLE V EVENT OF DEFAULT

The occurrence of any of the following events of default (“**Event of Default**”) shall, at the option of the Holder hereof, make all sums of principal and interest then remaining unpaid hereon and all other amounts payable hereunder immediately due and payable, upon demand, without presentment, or grace period, all of which hereby are expressly waived, except as set forth below:

5.1 Failure to Pay Principal. The Borrower fails to pay any principal, interest, or other sum due under this Note whether on demand, at maturity, upon acceleration, Change of Control or otherwise.

5.2 Conversion of Note into Common Stock. The Borrower fails to issue shares of Common Stock to the Holder (or announces or threatens 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 (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 or fails to remove 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 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 announcement, statement or threat not to honor its obligations shall not be rescinded in writing) for ten (10) days after the Borrower shall have been notified thereof in writing by the Holder.

5.3 Breach of Covenant. The Borrower or any Subsidiary of Borrower breaches any material covenant or other material term or condition of this Note or the Exchange Agreement in any material respect and

such breach, if subject to cure, continues for a period of five (5) business days after written notice to the Borrower or any such Subsidiary of Borrower from the Holder.

5.4 Breach of Representations and Warranties. Any material representation or warranty of the Borrower or any Subsidiary of Borrower made herein or in the Exchange Agreement, in any statement or certificate given in writing pursuant hereto or in connection herewith or therewith shall be false or misleading in any material respect as of the date made and as of the Issue Date.

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

5.6 Cessation of Operations. Any cessation of operations by Borrower or any operating Subsidiary of Borrower for a period of 30 consecutive days.

5.7 Maintenance of Assets. The failure by Borrower or any Subsidiary of Borrower to protect, defend and maintain validity and enforceability of any material intellectual property rights, personal, real property or other assets which are necessary to conduct its business (whether now or in the future).

5.8 Receiver or Trustee. The Borrower or any Subsidiary of 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.

5.9 Judgments. Any money judgment, writ or similar process shall be entered or filed against the Borrower or any Subsidiary of the Borrower or any of its property or other assets for more than Fifty Thousand Dollars (\$50,000), and shall remain unvacated, unbonded or unstayed for a period of twenty (20) days unless otherwise consented to by the Holder, which consent will not be unreasonably withheld.

5.10 Bankruptcy. Bankruptcy, insolvency, reorganization or liquidation proceedings or other proceedings or relief under any bankruptcy law or any law for the relief of debtors shall be instituted by the Borrower or any Subsidiary of Borrower or any such proceeding shall be instituted against the Borrower or any Subsidiary of Borrower, which proceedings are not, within sixty (60) days after institution thereof, discharged or stayed pending appeal.

5.11 Delisting. An event resulting in the Borrower's Common Stock no longer being quoted on the Over-The-Counter Bulletin Board (the "OTCBB"); failure to comply with the requirements for continued quotation on the OTCBB for a period of five (5) consecutive trading days; or notification from the OTCBB that the Borrower is not in compliance with the conditions for such continued quotation and such non-compliance continues for five (5) days following such notification. If the Borrower's Common Stock is quoted by OTC Markets, Inc. f/k/a "Pink Sheets," then any event or failure of the Borrower's Common Stock to be listed as "Pink Current Information" for trading or quotation for five (5) or more consecutive days.

5.12 DTC Eligible. An event resulting in the Borrower's Common Stock no longer being eligible to deposit (either electronically or by physical certificates, or otherwise) shares into the DTC system; failure to comply with the requirements for continued DTC eligibility for a period of seven (7) consecutive trading days; or notification from DTC that the Borrower is not in compliance with the conditions for such continued DTC eligibility and such non-compliance continues for seven (7) days following such notification

5.13 Stop Trade. An SEC or judicial stop trade or order trading suspension with respect to the Borrower's Common Stock that lasts for seven (7) or more consecutive trading days.

5.14 Failure to Deliver Replacement Note. Borrower's failures to timely deliver, if required, a replacement Note.

5.15 Financial Statement Restatement. A restatement of any financial statements filed by the Borrower with the SEC for any date or period from two years prior to the Issue Date of this Note and until this Note is no longer outstanding, if the result of such restatement could reasonably be expected to have, by comparison to the unrestated financial statements, a material adverse effect on the Borrower's business or operations.

5.16 Reverse Splits. The Borrower effectuates a reverse split of its Common Stock without twenty-five (25) business days prior written notice to the Holder.

5.17 Misrepresentations. Borrower or any representative acting for Borrower makes any representation, warranty, or other statement now or later in this Note or in any writing delivered to the Holder or to induce the Holder to enter this Note, and such representation, warranty, or other statement is incorrect or contains any untrue statement of a material fact, or omits or will omit to state a material fact necessary to make the statements or facts contained herein or therein not misleading in any material respect in light of the circumstances under which they were made.

5.18 Other Note Default. A default by the Borrower or the occurrence of an Event of Default under any other note issued by the Borrower.

5.19 Failure to Timely File Borrower's Financial Reports. The Borrower fails to timely file all reporting required under the Exchange Act, filed with the SEC and, if the Borrower's Common Stock is quoted by OTC Markets, Inc. f/k/a "Pink Sheets," then the Borrower's failure to timely file all reports required to be filed by it with OTC Markets, Inc. f/k/a "Pink Sheets" whereby the Borrower either (i) fails to be reported as "Pink Current Information" designated company, or (ii) is reported as "No Inside."

5.20 Default Under the Note. An Event of Default has occurred and is continuing under this Note, then, upon the occurrence and during the continuation of any Event of Default specified in Section 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.9, 5.10, 5.11, 5.12, 5.13, 5.14, 5.15, 5.16, 5.17, 5.18 or 5.19, at the option of the Holder exercisable through the delivery of written notice to the Borrower by such Holder (the "**Default Notice**"), and upon the occurrence of an Event of Default specified in Section 5.8, 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 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 Payment Date**") plus (y) Default Interest, if any, on the amounts referred to in clauses (w) and/or (x) plus (z) any other amounts owed to the Holder pursuant to this Note (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, any and all 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 then in effect divided by the Conversion Price then in effect.

**ARTICLE VI
MISCELLANEOUS**

6.1 Failure or Indulgence Not Waiver. No failure or delay on the part of the Holder hereof in the exercise of any power, right or privilege hereunder shall operate as a waiver, election, or acquiescence 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 privilege. No waiver hereunder shall be effective unless signed by the party granting the waiver and then is only effective for the specific instance and purpose for which it is given. All rights and remedies existing hereunder are cumulative to, and not exclusive of, any rights or remedies otherwise available provided for by law, or in equity.

6.2 Demand Waiver. Borrower hereby waives: (i) demand, notice of default, delinquency or dishonor, notice of payment and nonpayment, notice of any default, notice of acceleration, nonpayment at maturity, notice of costs, expenses and losses and interest thereon, notice of late charges; (ii) all defenses and pleas on the grounds of any release, compromise, settlement, extension, or extensions of the time of payment or any due date under this Note, in whole or in part, whether before or after maturity and with or without notice; and (iii) diligence in taking any action to collect any sums owing under this Note or in proceeding against any the rights and interests in and to properties securing payment of this Note such as, but not limited to, the renewal of accounts, documents, instruments, chattel paper, and guarantees held by the Holder on which Borrower is liable.

6.3 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, electronic mail (email), or facsimile, to such 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, when received, (b) upon email or facsimile, upon confirmation of receipt by the recipient, or (c) on the third 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.

6.4 Amendment Provision. The term “Note” and all reference thereto, as used throughout this instrument, shall mean this instrument as originally executed, or if later amended or supplemented in writing, then as so amended or supplemented.

6.5 Assignability. The Holder, without consent from or notice to anyone, may at any time assign the Holder’s rights in this Note, the Borrower’s obligations under this Note, or any part thereof. This Note shall be binding upon the Borrower and their respective legal representatives, heirs and its successors, and shall inure to the benefit of the Holder and its successors, assigns, heirs, administrators and transferees. The Borrower may not assign its obligations under this Note.

6.6 Cost of Collection. Borrower shall pay to the Holder, on demand and if demanded, prior to any conclusion of any action related hereto, the amount of any and all expenses, including, without limitation, attorneys’ fees, appellate attorney’s fees, legal costs and expenses, as well as collection agency fees and costs, any of which the Holder, whether or not the Holder agrees to dismiss an action upon payment of sums allegedly due, obtains substantially the relief sought or may incur in connection with (a) enforcement or collection of this Note following an Event of Default; (b) exercise or enforcement of any the rights, remedies or powers of the Holder hereunder or with respect to any or all of the obligations under this Note upon breach or threatened breach; or (c) failure by Borrower to perform and observe any agreements of Borrower contained herein.

6.7 Governing Law. This Note shall be governed by and construed in accordance with the laws of the State of New York without regard to conflicts of laws principles that would result in the application of the substantive laws of another jurisdiction. Any action brought by either party against the other concerning the transactions contemplated by this Agreement must be brought only in the civil or state courts of New York or in the federal courts located in the State and county of New York. Both parties and the individual signing this Agreement on behalf of the Borrower agree to submit to the jurisdiction of such courts. The prevailing party shall be entitled to recover from the other party its reasonable attorney’s fees and costs at both the trial and appellate level. In the event that any provision of this Note 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 unenforceability of any other provision of this Note in any other jurisdiction. Nothing contained herein shall be deemed or operate to preclude the Holder from bringing suit or taking other legal action against the Borrower in any other jurisdiction to collect on the Borrower's obligations to Holder, to realize on any collateral or any other security for such obligations, or to enforce a judgment or other decision in favor of the Holder. **This Note shall be deemed an unconditional obligation of Borrower for the payment of money and, without limitation to any other remedies of Holder, may be enforced against Borrower by summary proceeding pursuant to New York Civil Procedure Law and Rules Section 3213 or any similar rule or statute in the jurisdiction where enforcement is sought. For purposes of such rule or statute, any other document or agreement to which Holder and Borrower are parties or which Borrower delivered to Holder, which may be convenient or necessary to determine Holder's rights hereunder or Borrower's obligations to Holder are deemed a part of this Note, whether or not such other document or agreement was delivered together herewith or was executed apart from this Note.**

6.8 Waiver of Jury Trial. TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, BORROWER AND THE HOLDER EACH HEREBY KNOWINGLY, VOLUNTARILY, INTENTIONALLY AND IRREVOCABLY WAIVE THEIR RIGHT TO A JURY TRIAL OF ANY CLAIM OR CAUSE OF ACTION ARISING OUT OF OR BASED UPON THIS AGREEMENT OR ANY CONTEMPLATED TRANSACTION, OR ANY COURSE OF CONDUCT, COURSE OF DEALING, STATEMENTS (WHETHER VERBAL OR WRITTEN) OR ACTIONS OF OR BETWEEN ANY PARTY HERETO, INCLUDING CONTRACT, TORT, BREACH OF DUTY AND ALL OTHER CLAIMS. THE BORROWER AGREES AND CONSENTS TO THE GRANTING TO HOLDER OF RELIEF FROM ANY STAY ORDER WHICH MIGHT BE ENTERED BY ANY COURT AGAINST HOLDER AND TO ASSIST HOLDER IN OBTAINING SUCH RELIEF. THIS WAIVER IS A MATERIAL INDUCEMENT FOR BOTH PARTIES TO ENTER INTO THIS AGREEMENT. EACH PARTY HAS REVIEWED THIS WAIVER WITH ITS COUNSEL. THE BORROWER'S REASONABLE RELIANCE UPON SUCH INDUCEMENT IS HEREBY ACKNOWLEDGED.

6.9 Certain Amounts. Whenever pursuant to this Note the Borrower is required to pay an amount in excess of the outstanding principal amount (or the portion thereof required to be paid at that time) plus accrued and unpaid interest plus Default Interest on such interest, the Borrower and the Holder agree that the actual damages to the Holder from the receipt of cash payment on this Note may be difficult to determine and the amount to be so paid by the Borrower represents stipulated damages and not a penalty and is intended to compensate the Holder in part for loss of the opportunity to convert this Note and to earn a return from the sale of shares of Common Stock acquired upon conversion of this Note at a price in excess of the price paid for such shares pursuant to this Note. The Borrower and the Holder hereby agree that such amount of stipulated damages is not plainly disproportionate to the possible loss to the Holder from the receipt of a cash payment without the opportunity to convert this Note into shares of Common Stock. To the extent it may lawfully do so, the Borrower hereby agrees not to insist upon or plead or in any manner whatsoever claim, and will resist any and all efforts to be compelled to take the benefit or advantage of, usury laws wherever enacted, now or at any time hereafter in force, in connection with any claim, action or proceeding that may be brought by the Holder in order to enforce any right or remedy under this Note.

6.10 Usury Savings Clause. Borrower and Holder intend to contract in compliance with all state and federal usury laws governing the loan evidenced by this Note. Holder and Borrower agree that none of the terms of this Note shall be construed to require payment of interest at a rate in excess of the maximum interest rate allowed by any applicable state, federal or foreign usury laws. If Holder receives sums which constitute interest that would otherwise increase the effective interest rate on this Note to a rate in excess of that permitted by any applicable law, then all such sums constituting interest in excess of the maximum lawful rate shall at Holder's option either be credited to the payment of principal or returned to Borrower.

Notwithstanding any provision in this Note to the contrary, the total liability for payments of interest and payments in the nature of interest, including, without limitation, all charges, fees, exactions, or other sums which may at any time be deemed to be interest, shall not exceed the limit imposed by the usury laws of the jurisdiction governing this Note or any other applicable law. In the event the total liability of payments of interest and payments in the nature of interest, including, without limitation, all charges, fees, exactions or other sums which

may at any time be deemed to be interest, shall, for any reason whatsoever, result in an effective rate of interest, which for any month or other interest payment period exceeds the limit imposed by the usury laws of the jurisdiction governing this Note, all sums in excess of those lawfully collectible as interest for the period in question shall, without further agreement or notice by, between, or to any party hereto, be applied to the reduction of the outstanding principal balance due hereunder immediately upon receipt of such sums by the Holder hereof, with the same force and effect as though the Borrower had specifically designated such excess sums to be so applied to the reduction of the principal balance then outstanding, and the Holder hereof had agreed to accept such sums as a penalty-free payment of principal; provided, however, that the Holder may, at any time and from time to time, elect, by notice in writing to the Borrower, to waive, reduce, or limit the collection of any sums in excess of those lawfully collectible as interest, rather than accept such sums as a prepayment of the principal balance then outstanding. It is the intention of the parties that the Borrower does not intend or expect to pay, nor does the Holder intend or expect to charge or collect any interest under this Note greater than the highest non-usurious rate of interest which may be charged under applicable law.

6.11 Maximum Payments. Nothing contained herein shall be deemed to establish or require the payment of a rate of interest or other charges in excess of the maximum rate permitted by applicable law. In the event that the rate of interest required to be paid or other charges hereunder exceed the maximum rate permitted by applicable law, any payments in excess of such maximum rate shall be credited against amounts owed by the Borrower to the Holder and thus refunded to the Borrower, the manner of handling such excess to be at the Holder's election.

6.12 Further Assurances. At any time or from time to time after the date hereof, the Parties agree to cooperate with each other and, at the request of any other Party, to execute and deliver any further instruments or documents and to take all such further action as the other Party may reasonably request in order to evidence or effectuate the consummation of the transactions contemplated hereby and to otherwise carry out the intent of the Parties hereunder.

6.13 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 inequity, 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.

6.14 No Impairment. The Borrower will not, by amendment of its Articles of Incorporation or By-Laws or other organizational document, or through reorganization, consolidation, merger, dissolution, issue or sale of securities, sale of assets or any other voluntary action, willfully avoid or seek to avoid the observance or performance of any of the terms of this Note, but will at all times in good faith assist in the carrying out of all such terms and in the taking of all such action as may be necessary or appropriate in order to protect the rights of the Holder under this Note against impairment or dilution.

6.15 Substitute Note or Notes. Upon (i) receipt by the Borrower of evidence reasonably satisfactory to it of the ownership of and the loss, theft, destruction or mutilation hereof, and, in the case of loss, theft or destruction, of any indemnification undertaking by the Holder to the Borrower in customary form, or (ii) the request of the Holder of this Note upon surrender hereof, the Borrower shall execute and deliver in lieu hereof, a new Note or Notes, payable to the order of the Holder or such persons as the Holder may request and in a principal amount equal to the unpaid principal amount hereof, which shall be dated and bear interest from the date to which interest has theretofore been paid hereon. Each such Note shall in all other respects be in the same form and be treated the same as this Note and all references herein to this Note shall apply to each such Note. This Note is exchangeable, upon the surrender hereof by the Holder at the principal office of the Borrower, for a new Note or Notes representing in the aggregate the outstanding Principal of this Note, and each such new Note will represent such portion of such outstanding Principal as is designated by the Holder at the time of such surrender.

6.16 Absolute Obligation. No provision of this Note shall alter or impair the obligation of the Borrower, which is absolute and unconditional, to pay the principal of, accrued interest, Default Amounts, or

damages as applicable, on this Note at the time, place, and rate, and in the coin or currency, herein prescribed. This Note is a direct, unconditional and secured debt obligation of the Borrower.

6.17 Relationship. The relationship of the parties to this Note is determined solely by the provisions of this Note. The parties do not intend to create any agency, partnership, joint venture, trust, fiduciary or other relationship with duties or incidents different from those of parties to an arm's-length contract.

6.18 Entire Agreement. This Note and any instruments and agreements to be executed pursuant to this Note, sets forth the entire agreement and understanding of the Parties with respect to its subject matter of this Note and supersedes, merges and replaces all prior and contemporaneous understandings, discussions and negotiations, oral or written, regarding the same subject matter which shall remain in full force and effect and may not be altered or modified, except in writing and signed by the party to be charged thereby, and supersedes any and all previous discussions between the parties relating to the subject matter thereof.

6.19 Counterparts. This Note may be executed in two or more counterparts, all of which when taken together shall be considered one and the same agreement and shall become effective when this Note has been signed by the Borrower and delivered to any other party, it being understood that all parties need not sign the same counterpart. In the event that any signature is delivered by facsimile transmission, by email in "portable document format" (".pdf"), electronic signature or other similar electronic means intended to preserve the original graphic and pictorial appearance of this Note, such signature shall have the same effect as physical delivery of the paper document bearing original signature and create a valid and binding obligation of the party executing (or on whose behalf such signature is executed) the same with the same force and effect as if such facsimile signature were an original thereof.

6.20 Counsel. The parties expressly acknowledge that each has been advised to seek separate counsel for advice in this matter and has been given a reasonable opportunity to do so.

6.21 Headings. The headings in this Note are for convenience of reference only and shall not affect the interpretation of this Note.

[Signatures on Following Pages]

IN WITNESS WHEREOF, Borrower has caused this Promissory Note to be signed in its name by anauthorized officer as of the first date written above.

ASCENT SOLAR TECHNOLOGIES, INC.

By: /s/ Victor Lee

Name: Victor Lee

Title: President & CEO

EXHIBIT A
ASCENT SOLAR TECHNOLOGIES, INC.
NOTICE OF CONVERSION

(To be Executed by the Registered Holder in order to Convert the Note)

The undersigned hereby irrevocably elects to convert the sum of: \$_____ principal amount due under the terms of the Note (defined below) into shares of common stock, par value \$0.0001 per share ("**Common Stock**"), of **ASCENT SOLAR TECHNOLOGIES, INC.** a Delaware corporation (the "**Borrower**") according to the conditions of the Unsecured Convertible Promissory Note of the Borrower dated as of _____ (the "**Note**"), as of the date written below. If securities are to be issued in the name of a person other than the undersigned, the undersigned will pay all transfer taxes payable with respect thereto and is delivering herewith such certificates. No fee will be charged to the Holder for any conversion, except for transfer taxes, if any. A copy of each Note is attached hereto (or evidence of loss, theft or destruction thereof).

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: _____ DTC#: _____
Account Number: _____ Name: _____

In lieu of receiving shares of Common Stock issuable pursuant to this Notice of Conversion by way of a DWAC Transfer, 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:

Name: _____
Address: _____

The undersigned represents and warrants that all offers and sales by the undersigned of the securities issuable to the undersigned upon conversion of the Note shall be made pursuant to registration of the securities under the Securities Act of 1933, as amended (the "**Act**"), or pursuant to an exemption from registration under the Act.

Date of Conversion: _____
Conversion Price: _____
Applicable Conversion Discount: _____
Conversion Shares: _____
Default Sums/Damages Shares: _____
Total number of Shares of Common Stock to be Issued Pursuant
To the terms of the Notes: _____
Conversion Shares to be Registered to the Following: _____
Name: _____
Address: _____
Address: _____

[NAME OF HOLDER]

By: _____
Name: _____
Title: _____

The Borrower hereby acknowledges this Notice of Conversion and agrees to direct the Borrower’s Transfer Agent to issue the above indicated number of shares of Common Stock.

ASCENT SOLAR TECHNOLOGIES, INC.

By: _____
Name: _____
Title: _____

THIS PROMISSORY NOTE HAS NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED, OR APPLICABLE STATE SECURITIES LAWS. THE SECURITIES MAY NOT BE OFFERED FOR SALE, SOLD, TRANSFERRED OR ASSIGNED (I) IN THE ABSENCE OF (A) AN EFFECTIVE REGISTRATION STATEMENT FOR THE SECURITIES UNDER THE SECURITIES ACT OF 1933, AS AMENDED, OR (B) AN OPINION OF COUNSEL (WHICH COUNSEL SHALL BE SELECTED BY THE HOLDER), IN A GENERALLY ACCEPTABLE FORM, THAT REGISTRATION IS NOT REQUIRED UNDER SAID ACT OR (II) UNLESS SOLD PURSUANT TO RULE 144 OR RULE 144A UNDER SAID ACT. NOTWITHSTANDING THE FOREGOING, THE SECURITIES MAY BE PLEDGED IN CONNECTION WITH A BONA FIDE MARGIN ACCOUNT OR OTHER LOAN OR FINANCING ARRANGEMENT SECURED BY THE SECURITIES.

Remaining Principal Amount: \$1,000,000.00

Original Issue Date: December 18, 2020

Replacement Note Issue Date: January 21, 2022

UNSECURED CONVERTIBLE PROMISSORY NOTE

FOR VALUE RECEIVED, ASCENT SOLAR TECHNOLOGIES, INC., a Delaware corporation (hereinafter called “**Borrower**”), hereby promises to pay to Nanyang Investment Management Pte Ltd, a Singapore incorporation company in its capacity as manager, for and on behalf of a client account, or its assigns (the “**Holder**” and together with the Borrower, the “**Parties**”) or order, without demand, the sum of One Million Dollars (\$1,000,000.00) (“**Principal Amount**”), without accrued interest on the unpaid principal balance hereof and maturing on December 18, 2025 (the “**Maturity Date**”) together with fees incurred or other amounts owing hereunder, all as set forth below in this Promissory Note (this “**Note**” or this “**Agreement**”), if not sooner paid. All payments due hereunder (to the extent not converted into the Borrower’s common stock, \$.0001 par value per share (the “**Common Stock**”) in accordance with the terms hereof) shall be made in Common Stock equal to the Conversion Price as stipulated in Clause 2.1(b) and such payments shall be applied to amounts owing under the Note by Holder, in its sole discretion.

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 GENERAL PROVISIONS

1.1 Payment Grace Period. The Borrower shall have a five (5) day grace period to pay any monetary amounts due under this Note, after which grace period a default interest rate of ten percent (10%) per annum shall apply from the due date thereof until the same is paid (“**Default Interest**”).

1.2 Original Issue Discount. The Borrower acknowledges that the Principal Amount of this Note exceeds the Purchase Price for this Note and that such excess is an original issue discount and shall be fully earned and charged to the Borrower upon the execution of this Note, and shall be paid to the Holder as part of the outstanding principal balance as set forth in this Note.

1.3 Application of Payments. The Borrower acknowledges that the payments made in connection with this Note shall be applied first to collection expenses (including all attorneys' fees and expenses), if any, thereafter to amounts due hereunder other than principal and interest, thereafter to accrued and unpaid interest (if any) and finally to Principal Amount all in the Holder's sole discretion.

1.4 Change of Control. In the event of (i) any transaction or series of related transactions (including any reorganization, merger or consolidation) by an individual or legal entity or "group" (as described in Rule 13d-5(b)(1) promulgated under the Exchange Act (as defined below)) of effective control (whether through legal or beneficial ownership of capital stock of the Borrower, by contract or otherwise) that results in the transfer of 33% or more of the outstanding voting power of the Borrower, (ii) the Borrower merges into or consolidates with any other Person, or any Person merges into or consolidates with the Borrower and, after giving effect to such transaction, the stockholders of the Borrower immediately prior to such transaction own less than 66% of the aggregate voting power of the Borrower or the successor entity of such transaction, or (iii) a sale of all or substantially all of the assets of the Borrower to another person or entity ((i), (ii) and (iii) together, a "**Change of Control**"), this Note shall be automatically due and payable in full, immediately. The Borrower will give the Holder not less than twenty (20) business days prior written notice of the occurrence of any events referred to in this Section 1.4. The Holder acknowledges that the capital raising and restructuring transactions that are occurring on or about the date of this Note shall not be considered a Change of Control.

1.5 Exchange and Exchange Agreement. This Note (in the original principal amount of \$10,340,000.00) and a related note (in the principal amount of \$160,000.00) were issued pursuant to an exchange agreement between the Borrower and the original holder dated December 18, 2020 (the "**Exchange Agreement**"). This Note is being issued in partial replacement of the original \$10.34 million Note following an assignment of a \$1,000,000 portion by the original holder to the Holder on the date hereof.

1.6 Miscellaneous. The Default Interest on this Note shall be calculated on the basis of a 365-day year and the actual number of days elapsed. Principal and interest on this Note and other payments in connection with this Note shall be payable at the Holder's offices as designated in lawful money of the United States of America in immediately available funds without set-off, deduction or counterclaim. Upon assignment of the interest of Holder in this Note, Borrower shall instead make its payment pursuant to the assignee's instructions upon receipt of written notice thereof.

ARTICLE II OPTIONAL CONVERSION

The Holder, in its sole option, shall have the right to convert the principal due under this Note into Shares of the Borrower's Common Stock as set forth below.

2.1 Conversion into the Borrower's Common Stock.

(a) Conversion Right. At the Holder's sole discretion, the Holder shall have the right from and after the date of the issuance of this Note and then at any time until this Note is fully paid, to convert any outstanding and unpaid principal portion of this Note at the election of the Holder (the date of giving of such notice of conversion in accordance with Section 2.3(a) being a "**Conversion Date**") into fully paid and nonassessable shares of Common Stock as such stock exists on the date of issuance of this Note, or any shares of capital stock of Borrower into which such Common Stock shall hereafter be changed or reclassified, at the conversion price as defined in Section 2.1(b) hereof (the "**Conversion Price**"), determined as provided herein.

Upon delivery to the Borrower of a completed notice of conversion, a form of which is annexed hereto as Exhibit A (the "**Notice of Conversion**"), Borrower shall issue and deliver to the Holder within three (3) business days after the Conversion Date (such third day being the "**Delivery Date**") that number of shares of Common Stock for the portion of the Note converted in accordance with the foregoing. At the election of the Holder, the Borrower will deliver accrued but unpaid interest on the Note, if any, through the Conversion Date directly to the Holder on or before the Delivery Date. The number of shares of Common Stock to be issued upon

each conversion of this Note shall be determined by dividing that portion of the principal of the Note and interest, if any, to be converted, by the Conversion Price. To effect conversions hereunder, the Holder shall not be required to physically surrender this Note to the Borrower unless the entire principal amount of this Note, plus all accrued and unpaid interest thereon, has been so converted. Conversions hereunder shall have the effect of lowering the outstanding principal amount of this Note in an amount equal to the applicable conversion listed on the Notice of Conversion. The Holder and the Borrower shall maintain records showing the principal amount(s) converted and the date of such conversion(s). In the event of any dispute or discrepancy, the records of the Holder shall be controlling and determinative in the absence of manifest error.

(b) **Conversion Price.** Subject to adjustment as provided in Section 2.1(c) hereof, the conversion price per share shall be equal to \$0.0001 (“**Conversion Price**”). The Conversion Price may be adjusted pursuant to the other terms of this Note.

(c) **Effect of Certain Events.** The Conversion Price and number and kind of shares or other securities to be issued upon conversion determined pursuant to Section 2.1(a), shall be subject to adjustment from time to time upon the happening of certain events while this conversion right remains outstanding, as follows:

A. **Reclassification, etc.** If the Borrower at any time shall, by reclassification or otherwise, change the Common Stock into the same or a different number of securities of any class or classes that may be issued or outstanding, this Note, as to the unpaid principal portion thereof, shall thereafter be deemed to evidence the right to purchase an adjusted number of such securities and kind of securities as would have been issuable as the result of such change with respect to the Common Stock immediately prior to such reclassification or other change.

B. **Stock Splits, Combinations and Dividends.** If the shares of Common Stock are subdivided or combined into a greater or smaller number of shares of Common Stock, or if a dividend is paid on the Common Stock in shares of Common Stock, the Conversion Price shall be proportionately reduced in case of subdivision of shares or stock dividend or proportionately increased in the case of combination of shares, in each such case by the ratio which the total number of shares of Common Stock outstanding immediately after such event bears to the total number of shares of Common Stock outstanding immediately prior to such event.

(d) **Notice of Adjustments.** Whenever the Conversion Price is adjusted pursuant to Section 2.1(c) above, the Borrower shall promptly mail to the Holder a notice setting forth the Conversion Price after such adjustment and setting forth a statement of the facts requiring such adjustment. The Borrower shall, upon the written request at any time of the Holder, furnish to such Holder a like certificate setting forth (i) such adjustment or readjustment, (ii) the Conversion Price at the time in effect and (iii) the number of shares of Common Stock and the amount, if any, of other securities or property which at the time would be received upon conversion of the Note at the sole expense of the Borrower.

(e) **Further Adjustments.** In case at any time or, from time to time, the Borrower shall take any action that affects the Common Stock or other class of securities into which this Note may be converted under Article II, other than an action described herein, then, unless such action will not have a material adverse effect upon the rights of the Holder, the number of shares of such class of Common Stock (or other securities) into which this Note is convertible shall be adjusted in such a manner and at such time as shall be equitable under the circumstances.

(f) **Voluntary Adjustments.** The Borrower may at any time during the term of this Note reduce the then current Conversion Price to any amount and for any period of time deemed appropriate by the Board of Directors of the Borrower.

2.2 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.

2.3 **Method of Conversion.** This Note may be converted by the Holder in whole or in part as described in Section 2.1(a) hereof. Upon partial conversion of this Note, a new Note containing the same date and provisions of this Note shall, at the request of the Holder, be issued by the Borrower to the Holder for the principal balance of this Note and interest which shall not have been converted or paid.

(a) **Mechanics of Conversion.** 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 copy of an executed Notice of Conversion in the form attached hereto as Exhibit A (via facsimile, electronic mail (email) or other reasonable means of communication dispatched on the Conversion Date on or prior to 11:59 p.m., New York, New York time). The Conversion Date specified in the Notice of Conversion shall be the Conversion Date so long as the Notice of Conversion is received by the Borrower before 11:59 p.m., New York, New York time, on such date.

(b) **Borrower's Response.** Upon receipt by the Borrower of a copy of a Notice of Conversion, the Borrower shall as soon as practicable, but in no event later than two (2) business days after receipt of such Conversion Notice, send, via facsimile or electronic mail (email) (or otherwise deliver) a confirmation of receipt of such Conversion Notice (the "**Conversion Confirmation**") to the Holder indicating that the Borrower will process such Conversion Notice in accordance with the terms herein. In the event the Borrower fails to issue its Conversion Confirmation within said two (2) Business Day time period, the Holder shall have the absolute and irrevocable right and authority to deliver the fully executed Conversion Notice to the Borrower's transfer agent, and the Borrower's transfer agent shall issue the applicable shares of Common Stock specified in such Conversion Notice (the "**Conversion Shares**") to Holder as hereby provided. To effect conversions hereunder, the Holder shall not be required to physically surrender this Note to the Borrower unless the entire principal amount of this Note, plus all accrued and unpaid interest thereon and other sums due hereunder, has been so converted. Conversions hereunder shall have the effect of lowering the outstanding sums owing under this Note in an amount stated in each applicable conversion notice. The Holder and the Borrower shall maintain records showing the principal and/or interest amount(s) converted and the date of such conversion(s).

(c) **Delivery of Common Stock Upon Conversion.** Upon receipt by the Borrower from the Holder of a facsimile transmission (or other reasonable means of communication) of a Notice of Conversion meeting the requirements for conversion as provided in this Section 2.3, the Borrower shall issue and deliver or cause to be issued and delivered to or upon the order of the Holder the electronic transfer (as described in Section 2.3 (e) herein below) the Common Stock issuable upon such conversion within three (3) business days after such receipt (and, solely in the case of conversion of the entire unpaid principal amount hereof, surrender of this Note) (such fifth business day being hereinafter referred to as the "**Deadline**") in accordance with the terms hereof.

(d) **Obligation of Borrower to Deliver Common Stock Absolute.** Upon submission by the Holder to 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 under this Article II, 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 or inaction 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 or any violation or alleged violation of law by the Holder or any other person or entity, and irrespective of any other circumstance which might otherwise limit such obligation of the Borrower to the Holder in connection with such conversion.

(e) **Delivery of Common Stock by Electronic Transfer.** In lieu of delivering physical certificates representing the Common Stock issuable upon conversion, provided the Borrower's transfer agent is participating in the Depository Trust Company ("**DTC**") Fast Automated Securities Transfer ("**FAST**") program

or any similar program hereafter adopted by DTC performing substantially the same function, upon request of the Holder and its compliance with the provisions contained in Section 2.1 and in this Section 2.3, the Borrower shall 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 Withdrawal Agent Commission ("DWAC") system.

(f) **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 more than two (2) business days after the Deadline the Borrower shall pay to the Holder \$1,000 per day in cash or stock under the terms of this Note, for each day beyond the Deadline that the Borrower fails to deliver such Common Stock. Such cash amount shall be paid to Holder by the fifth (5th) 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.

(g) **Rescindment of Conversion Notice.** 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 (A) the Borrower fails to respond to Holder with a Conversion Confirmation pursuant to Section 2.3(b), (B) the Borrower fails to deliver of the Common Stock issuable upon conversion of this Note is more than two (2) business days after the Deadline, (C) the Holder is unable to procure a legal opinion required to have the Common Stock issued unrestricted and/or deposited to sell for any reason related to the Borrower's standing with the Securities and Exchange Commission ("SEC") or FINRA, or any action or inaction by the Borrower, (D) the Holder is unable to deposit the Common Stock requested in the Conversion Notice for any reason related to the Borrower's standing with the SEC or FINRA, or any action or inaction by the Borrower, (E) if the Holder is informed by the Borrower that the Borrower does not have enough Common Stock authorized to satisfy the Conversion Notice, or (F) if OTC Markets, Inc. f/k/a "Pink Sheets" changes the Borrower's designation to 'Limited Information' (Yield), 'No Information' (Stop Sign), 'Caveat Emptor' (Skull and Crossbones), or 'OTC', 'Other OTC' or 'Grey Market' (Exclamation Mark Sign) on any day after the date of the Conversion Notice prior to delivery of such Common Stock, the Holder may, at the Holder's sole discretion, rescind or void the Conversion Notice ("Rescindment Notice") by notifying the Borrower in the same manner that a Conversion Notice is required to be delivered to the Borrower pursuant to the terms of this Note. If the Holder chooses to provide the Borrower a timely Rescindment Notice, the Borrower shall pay to the Holder \$2,000 per day in cash or stock under the terms of this Note, for each day that the Borrower was in violation of A-F in this Section 2.3(g) up until the day the Holder submits a Rescindment Notice to the Borrower. Such cash amount shall be paid to Holder by the fifth (5th) 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.

(h) **Transfer Taxes and Legal Opinions.** Without limitation, the issuance of certificates for shares of the Common Stock on conversion of this Note shall be made without charge to the Holder hereof for any legal opinion fees, documentary stamp or similar taxes, or any other issuance or transfer fees of any nature or kind that may be payable in respect of the issue or delivery of such certificates, any such taxes or fees, if payable, to be paid by the Borrower. The Borrower agrees, at the Borrower's sole expense, to provide the Holder with a valid and reasonably accepted legal opinion concerning the issuance of certificates for shares of the Common Stock on conversion of this Note. If the Holder is required to obtain a legal opinion, the Borrower shall reimburse the Holder \$2,000 which may be deducted from the principal received by the Conversion Notice.

2.4 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 Securities Act of 1933, as amended (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 or (iii) such shares are sold or transferred pursuant to Rule 144 under the Act (or a successor rule) (“**Rule 144**”) or (iv) 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 2.4. Until such time as the shares of Common Stock issuable upon conversion of this Note have been registered under the Act or an exemption that permits removal of the legend, shall bear a legend substantially in the following form, as appropriate:

“THE SECURITIES REPRESENTED BY THIS CERTIFICATE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED. THE SECURITIES MAY NOT BE SOLD, TRANSFERRED OR ASSIGNED IN THE ABSENCE OF AN EFFECTIVE REGISTRATION STATEMENT FOR THE SECURITIES UNDER SAID ACT, OR AN OPINION OF COUNSEL IN FORM, SUBSTANCE AND SCOPE CUSTOMARY FOR OPINIONS OF COUNSEL IN COMPARABLE TRANSACTIONS, THAT REGISTRATION IS NOT REQUIRED UNDER SAID ACT UNLESS SOLD PURSUANT TO RULE 144 OR REGULATIONS UNDER SAID ACT.”

The legend set forth above shall be removed and the Borrower shall issue to the Holder a new certificate therefor free of any transfer legend if (i) the Borrower or its transfer agent shall have received 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 Common Stock may be made without registration under the Act and the shares are so sold or transferred, (ii) such Holder provides the Borrower or its transfer agent with reasonable assurances that the Common Stock issuable upon conversion of this Note (to the extent such securities are deemed to have been acquired on the same date) can be sold pursuant to Rule 144 without volume or manner-of-sale restrictions or current public information requirements as determined by the counsel to the Borrower as set forth in a written opinion letter to such effect and addressed to the Transfer Agent and the Holder, or (iii) 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 Rule 144 without any restriction as to the number of securities as of a particular date that can then be immediately sold. The Borrower acknowledges and agrees that the holding period of the Common Stock issuable upon conversion of this Note under Rule 144(d) shall be deemed to have commenced as of October 22, 2019 (the most recent issuance date of the Exchange Securities exchanged for this Note pursuant to the Exchange Agreement) and, accordingly, a failure to remove legends from Common Stock issuable upon conversion of this Note shall cause liquidated damages to accrue pursuant to Section 2.3 herein. In any event, and subject to compliance with applicable securities laws, the Holder may enter into lawful hedging transactions in the course of hedging the position it assumes and the Holder may also enter into lawful short positions or other derivative transactions relating to the Common Stock or other securities, or interests in the Common Stock or other securities, and deliver the Common Stock or other securities, or interests in the Common Stock, to close out its short or other positions or otherwise settle other transactions, or loan or pledge the Common Stock, or interests in the Common Stock, to third parties who in turn may dispose of the Common Stock.

2.5 Holder’s Conversion Limitations. The Borrower shall not effect any conversion of this Note, and the Holder shall not have the right to convert any portion of this Note, to the extent that after giving effect to the conversion set forth on the applicable Notice of Conversion, the Holder (together with the Holder’s Affiliates (such Persons, “Attribution Parties”)) would beneficially own in excess of the Beneficial Ownership Limitation (as defined below). For purposes of the foregoing sentence, the number of shares of Common Stock beneficially owned by the Holder and its Affiliates and Attribution Parties shall include the number of shares of Common Stock issuable upon conversion of this Note with respect to which such determination is being made, but shall exclude the number of shares of Common Stock which are issuable upon conversion of the remaining, unconverted principal amount of this Note beneficially owned by the Holder or any of its Affiliates or Attribution Parties and (ii) exercise or conversion of the unexercised or unconverted portion of any other securities of the Borrower subject to a limitation on conversion or exercise analogous to the limitation contained herein beneficially owned by the Holder or any of its Affiliates or Attribution Parties. Except as set forth in the preceding sentence, for purposes of this Section 2.5, beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. To the extent that the limitation contained in this Section 2.5 applies, the

determination of whether this Note is convertible (in relation to other securities owned by the Holder together with any Affiliates and Attribution Parties) and of which principal amount of this Note is convertible shall be in the sole discretion of the Holder, and the submission of a Notice of Conversion shall be deemed to be the Holder's determination of whether this Note may be converted (in relation to other securities owned by the Holder together with any Affiliates or Attribution Parties) and which principal amount of this Note is convertible, in each case subject to the Beneficial Ownership Limitation. To ensure compliance with this restriction, the Holder will be deemed to represent to the Borrower each time it delivers a Notice of Conversion that such Notice of Conversion has not violated the restrictions set forth in this paragraph and the Borrower shall have no obligation to verify or confirm the accuracy of such determination. In addition, a determination as to any group status as contemplated above shall be determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. For purposes of this Section 2.5, in determining the number of outstanding shares of Common Stock, the Holder may rely on the number of outstanding shares of Common Stock as stated in the most recent of the following: (i) the Borrower's most recent periodic or annual report filed with the Commission, as the case may be, (ii) a more recent public announcement by the Borrower, or (iii) a more recent written notice by the Borrower or the Borrower's transfer agent setting forth the number of shares of Common Stock outstanding. Upon the written or oral request of a Holder, the Borrower shall within two Trading Days confirm orally and in writing to the Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to the conversion or exercise of securities of the Borrower, including this Note, by the Holder or its Affiliates since the date as of which such number of outstanding shares of Common Stock was reported. The "Beneficial Ownership Limitation" shall be 4.99% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock issuable upon conversion of this Note held by the Holder. The Holder, upon notice to the Borrower, may increase or decrease the Beneficial Ownership Limitation provisions of this Section 2.5, provided that the Beneficial Ownership Limitation in no event exceeds 9.99% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock upon conversion of this Note held by the Holder and the Beneficial Ownership Limitation provisions of this Section 2.5 shall continue to apply. Any increase in the Beneficial Ownership Limitation will not be effective until the 61st day after such notice is delivered to the Borrower. The Beneficial Ownership Limitation provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 2.5 to correct this paragraph (or any portion hereof) which may be defective or inconsistent with the intended Beneficial Ownership Limitation contained herein or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitations contained in this paragraph shall apply to a successor holder of this Note.

2.6 Status as Shareholder. Upon submission of a Notice of Conversion by the Holder, (i) the shares covered thereby shall be deemed converted into shares of Common Stock and (ii) the Holder's rights as a Holder of such converted portion of this Note shall cease and terminate, excepting only the right to receive certificates for such shares of Common Stock and to any remedies provided herein or otherwise available at law or in equity to such Holder because of a failure by the Borrower to comply with the terms of this Note or the Exchange Agreement. Notwithstanding the foregoing, if a Holder has not received certificates for all shares of Common Stock prior to the tenth (10th) business day after the expiration of the Deadline with respect to a conversion of any portion of this Note for any reason, then (unless the Holder otherwise elects to retain its status as a holder of Common Stock by so notifying the Borrower) the Holder shall regain the rights of a Holder of this Note with respect to such unconverted portions of this Note and the Borrower shall, as soon as practicable, return such unconverted Note to the Holder or, if the Note has not been surrendered, adjust its records to reflect that such portion of this Note has not been converted. In all cases, the Holder shall retain all of its rights and remedies including, without limitation, (i) the right to receive Default Interest and Default Amounts for any Event of Default and (ii) the right to have the Default Interest and Default Amounts added to the principal amount of this Note which shall be convertible into Common Stock in accordance with the terms of this Note.

ARTICLE III REPRESENTATIONS AND WARRANTIES

3. Representations and Warranties of the Borrower. The Borrower hereby represents and warrants to the Holder that:

(a) The Borrower's Common Stock is registered under Section 12(g) of the Securities Exchange Act of 1934 (the "Exchange Act");

(b) The Borrower is subject to the reporting requirements of section 13 or 15(d) of the Exchange Act and has filed all required reports under section 13 or 15(d) of the Exchange Act during the 12 months prior to the date hereof (or for such shorter period that the issuer was required to file such reports);

(c) **Regulatory Compliance.** Borrower is not an "investment company" or a company "controlled" by an "investment company" under the Investment Company Act of 1940, as amended. Borrower is not engaged as one of its important activities in extending credit for margin stock (under Regulations X, T and U of the Federal Reserve Board of Governors). Borrower has complied in all material respects with the Federal Fair Labor Standards Act. Neither Borrower nor any of its subsidiaries ("Subsidiaries") is a "holding company" or an "affiliate" of a "holding company" or a "subsidiary company" of a "holding company" as each term is defined and used in the Public Utility Holding Company Act of 2005. Borrower has not violated any laws, ordinances or rules, the violation of which could reasonably be expected to have a material adverse effect on its business. None of Borrower's or any of its Subsidiaries' properties or assets has been used by Borrower or any Subsidiary or, to the best of Borrower's knowledge, by previous Persons, in disposing, producing, storing, treating, or transporting any hazardous substance other than legally. Borrower and each of its Subsidiaries have obtained all consents, approvals and authorizations of, made all declarations or filings with, and given all notices to, all Governmental Authorities that are necessary to continue their respective businesses as currently conducted;

(d) **Litigation.** There is no claim, legal action, suit, arbitration, investigation or other proceeding pending, or to the knowledge of the Borrower, threatened against or relating to the Borrower or its assets. Neither the Borrower nor any of its assets are subject to any outstanding judgment, order, writ, injunction or decree of any Governmental Authority. There is currently no investigation or review by any Governmental Authority with respect to the Borrower pending or, to the knowledge of the Borrower, threatened, nor has any Governmental Authority notified the Borrower of its intention to conduct the same;

(e) **SEC Matters.** To the knowledge of the Borrower, neither the Borrower, nor any current or past officer or director of the Borrower has ever been sanctioned, disciplined, fined, and/or imprisoned for any violations of any securities laws of the United States or any other jurisdiction.

ARTICLE IV CERTAIN COVENANTS

4.1 Exchange Listing, Existence. The Borrower shall make such filings, registrations or qualifications and take all other necessary action and will use its best efforts to obtain such consents, approvals and authorizations, if any, and satisfy all conditions that any stock exchange or the OTCBB (as defined below) may impose on the listing of the Common Stock and shall use its best efforts to obtain and maintain such listing continuously thereafter for so long as all or any of the principal amount of the Note remains outstanding. The Borrower shall maintain and preserve, and cause each of its Subsidiaries to maintain and preserve, its existence, rights and privileges, and become or remain, and cause each of its Subsidiaries to become or remain, duly qualified and in good standing in each jurisdiction in which the character of the properties owned or leased by it or in which the transaction of its business makes such qualification necessary.

4.2 No Integration. Neither the Borrower nor any of its affiliates (as defined in Rule 501(b) of Regulation D ("Regulation D") of the Act) has, directly or through any agent, sold, offered for sale, solicited offers to buy or otherwise negotiated in respect of, any security (as defined in the Securities Act), that is or will be integrated with the sale of the Note in a manner that would require registration of the Note under the Securities Act.

4.3 Shell Company Status. The Borrower is not now, and has not, prior to the date of this Note, been a "shell company" as such term is defined in Rule 12b-2 of the Exchange Act.

4.4 Public Information. The Borrower shall make such filings, registrations or qualifications and take all other necessary action and will use its best efforts to satisfy all conditions to be in compliance and satisfy the current public information requirement under Rule 144(c), more specifically with Rule 144(c)(1), and otherwise without restriction or limitation pursuant to Rule 144, and shall use its best efforts to obtain such listing on an and maintain such listing continuously thereafter for so long as all or any of the principal amount of the Note remains outstanding.

4.5 DTCC Eligibility. The Borrower shall make such filings, registrations or qualifications and take all other necessary action to remain DTCC-eligible and not have its eligibility revoked or “chilled” by the Depository Trust Company (“DTC”) or any similar program hereafter adopted performing substantially the same function.

4.6 Legal Action Notice. The Borrower shall promptly report of any legal actions pending or threatened in writing against Borrower or any of its Subsidiaries that could result in damages or costs to Borrower or any of its Subsidiaries of, individually or in the aggregate, Fifty Thousand Dollars (\$50,000) or more.

4.7 Other Financial Information. The Borrower shall deliver budgets, sales projections, operating plans and other financial information reasonably requested by the Holder.

4.8 Change in Nature of Business. So long as the Borrower shall have any obligation under this Note, the Borrower shall not make, or permit any of its Subsidiaries to make, any material change in the nature of its business as described in the Borrower’s most recent annual report filed on Form 10-K with the SEC. The Borrower shall not modify its corporate structure or purpose.

4.9 Statutory Disqualification. So long as the Borrower shall have any obligation under this Note, the Borrower nor any of its officers, directors, controlling persons, employees, representatives, agents, affiliates, or any other person working for or on behalf of the Borrower is or shall be subject to statutory disqualification as defined in Section 3(a)(39) of the Exchange Act, as amended or Rule 506(d) under the Act.

ARTICLE V EVENT OF DEFAULT

The occurrence of any of the following events of default (“**Event of Default**”) shall, at the option of the Holder hereof, make all sums of principal and interest then remaining unpaid hereon and all other amounts payable hereunder immediately due and payable, upon demand, without presentment, or grace period, all of which hereby are expressly waived, except as set forth below:

5.1 Failure to Pay Principal. The Borrower fails to pay any principal, interest, or other sum due under this Note whether on demand, at maturity, upon acceleration, Change of Control or otherwise.

5.2 Conversion of Note into Common Stock. The Borrower fails to issue shares of Common Stock to the Holder (or announces or threatens 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 (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 or fails to remove 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 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 announcement, statement or threat not to honor its obligations shall not be rescinded in writing) for ten (10) days after the Borrower shall have been notified thereof in writing by the Holder.

5.3 Breach of Covenant. The Borrower or any Subsidiary of Borrower breaches any material covenant or other material term or condition of this Note or the Exchange Agreement in any material respect and such breach, if subject to cure, continues for a period of five (5) business days after written notice to the Borrower or any such Subsidiary of Borrower from the Holder.

5.4 Breach of Representations and Warranties. Any material representation or warranty of the Borrower or any Subsidiary of Borrower made herein or in the Exchange Agreement, in any statement or certificate given in writing pursuant hereto or in connection herewith or therewith shall be false or misleading in any material respect as of the date made and as of the Issue Date.

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

5.6 Cessation of Operations. Any cessation of operations by Borrower or any operating Subsidiary of Borrower for a period of 30 consecutive days.

5.7 Maintenance of Assets. The failure by Borrower or any Subsidiary of Borrower to protect, defend and maintain validity and enforceability of any material intellectual property rights, personal, real property or other assets which are necessary to conduct its business (whether now or in the future).

5.8 Receiver or Trustee. The Borrower or any Subsidiary of 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.

5.9 Judgments. Any money judgment, writ or similar process shall be entered or filed against the Borrower or any Subsidiary of the Borrower or any of its property or other assets for more than Fifty Thousand Dollars (\$50,000), and shall remain unvacated, unbonded or unstayed for a period of twenty (20) days unless otherwise consented to by the Holder, which consent will not be unreasonably withheld.

5.10 Bankruptcy. Bankruptcy, insolvency, reorganization or liquidation proceedings or other proceedings or relief under any bankruptcy law or any law for the relief of debtors shall be instituted by the Borrower or any Subsidiary of Borrower or any such proceeding shall be instituted against the Borrower or any Subsidiary of Borrower, which proceedings are not, within sixty (60) days after institution thereof, discharged or stayed pending appeal.

5.11 Delisting. An event resulting in the Borrower's Common Stock no longer being quoted on the Over-The-Counter Bulletin Board (the "OTCBB"); failure to comply with the requirements for continued quotation on the OTCBB for a period of five (5) consecutive trading days; or notification from the OTCBB that the Borrower is not in compliance with the conditions for such continued quotation and such non-compliance continues for five (5) days following such notification. If the Borrower's Common Stock is quoted by OTC Markets, Inc. f/k/a "Pink Sheets," then any event or failure of the Borrower's Common Stock to be listed as "Pink Current Information" for trading or quotation for five (5) or more consecutive days.

5.12 DTC Eligible. An event resulting in the Borrower's Common Stock no longer being eligible to deposit (either electronically or by physical certificates, or otherwise) shares into the DTC system; failure to comply with the requirements for continued DTC eligibility for a period of seven (7) consecutive trading days; or notification from DTC that the Borrower is not in compliance with the conditions for such continued DTC eligibility and such non-compliance continues for seven (7) days following such notification

5.13 Stop Trade. An SEC or judicial stop trade or order trading suspension with respect to the Borrower's Common Stock that lasts for seven (7) or more consecutive trading days.

5.14 Failure to Deliver Replacement Note. Borrower's failures to timely deliver, if required, a replacement Note.

5.15 Financial Statement Restatement. A restatement of any financial statements filed by the Borrower with the SEC for any date or period from two years prior to the Issue Date of this Note and until this Note is no longer outstanding, if the result of such restatement could reasonably be expected to have, by comparison to the unrestated financial statements, a material adverse effect on the Borrower's business or operations.

5.16 Reverse Splits. The Borrower effectuates a reverse split of its Common Stock without twenty-five (25) business days prior written notice to the Holder.

5.17 Misrepresentations. Borrower or any representative acting for Borrower makes any representation, warranty, or other statement now or later in this Note or in any writing delivered to the Holder or to induce the Holder to enter this Note, and such representation, warranty, or other statement is incorrect or contains any untrue statement of a material fact, or omits or will omit to state a material fact necessary to make the statements or facts contained herein or therein not misleading in any material respect in light of the circumstances under which they were made.

5.18 Other Note Default. A default by the Borrower or the occurrence of an Event of Default under any other note issued by the Borrower.

5.19 Failure to Timely File Borrower's Financial Reports. The Borrower fails to timely file all reporting required under the Exchange Act, filed with the SEC and, if the Borrower's Common Stock is quoted by OTC Markets, Inc. f/k/a "Pink Sheets," then the Borrower's failure to timely file all reports required to be filed by it with OTC Markets, Inc. f/k/a "Pink Sheets" whereby the Borrower either (i) fails to be reported as "Pink Current Information" designated company, or (ii) is reported as "No Inside."

5.20 Default Under the Note. An Event of Default has occurred and is continuing under this Note, then, upon the occurrence and during the continuation of any Event of Default specified in Section 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.9, 5.10, 5.11, 5.12, 5.13, 5.14, 5.15, 5.16, 5.17, 5.18 or 5.19, at the option of the Holder exercisable through the delivery of written notice to the Borrower by such Holder (the "**Default Notice**"), and upon the occurrence of an Event of Default specified in Section 5.8, 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 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 Payment Date**") plus (y) Default Interest, if any, on the amounts referred to in clauses (w) and/or (x) plus (z) any other amounts owed to the Holder pursuant to this Note (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, any and all 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 then in effect divided by the Conversion Price then in effect.

ARTICLE VI MISCELLANEOUS

6.1 Failure or Indulgence Not Waiver. No failure or delay on the part of the Holder hereof in the exercise of any power, right or privilege hereunder shall operate as a waiver, election, or acquiescence 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 privilege. No waiver hereunder shall be effective unless signed by the party granting the waiver and then is only effective for the specific instance and purpose for which it is given. All rights and remedies existing hereunder are cumulative to, and not exclusive of, any rights or remedies otherwise available provided for by law, or in equity.

6.2 Demand Waiver. Borrower hereby waives: (i) demand, notice of default, delinquency or dishonor, notice of payment and nonpayment, notice of any default, notice of acceleration, nonpayment at maturity, notice of costs, expenses and losses and interest thereon, notice of late charges; (ii) all defenses and pleas on the grounds of any release, compromise, settlement, extension, or extensions of the time of payment or any due date under this Note, in whole or in part, whether before or after maturity and with or without notice; and (iii) diligence in taking any action to collect any sums owing under this Note or in proceeding against any the rights and interests in and to properties securing payment of this Note such as, but not limited to, the renewal of accounts, documents, instruments, chattel paper, and guarantees held by the Holder on which Borrower is liable.

6.3 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, electronic mail (email), or facsimile, to such 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, when received, (b) upon email or facsimile, upon confirmation of receipt by the recipient, or (c) on the third 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.

6.4 Amendment Provision. The term "Note" and all reference thereto, as used throughout this instrument, shall mean this instrument as originally executed, or if later amended or supplemented in writing, then as so amended or supplemented.

6.5 Assignability. The Holder, without consent from or notice to anyone, may at any time assign the Holder's rights in this Note, the Borrower's obligations under this Note, or any part thereof. This Note shall be binding upon the Borrower and their respective legal representatives, heirs and its successors, and shall inure to the benefit of the Holder and its successors, assigns, heirs, administrators and transferees. The Borrower may not assign its obligations under this Note.

6.6 Cost of Collection. Borrower shall pay to the Holder, on demand and if demanded, prior to any conclusion of any action related hereto, the amount of any and all expenses, including, without limitation, attorneys' fees, appellate attorney's fees, legal costs and expenses, as well as collection agency fees and costs, any of which the Holder, whether or not the Holder agrees to dismiss an action upon payment of sums allegedly due, obtains substantially the relief sought or may incur in connection with (a) enforcement or collection of this Note following an Event of Default; (b) exercise or enforcement of any the rights, remedies or powers of the Holder hereunder or with respect to any or all of the obligations under this Note upon breach or threatened breach; or (c) failure by Borrower to perform and observe any agreements of Borrower contained herein.

6.7 Governing Law. This Note shall be governed by and construed in accordance with the laws of the State of New York without regard to conflicts of laws principles that would result in the application of the substantive laws of another jurisdiction. Any action brought by either party against the other concerning the transactions contemplated by this Agreement must be brought only in the civil or state courts of New York or in the federal courts located in the State and county of New York. Both parties and the individual signing this Agreement on behalf of the Borrower agree to submit to the jurisdiction of such courts. The prevailing party shall be entitled to recover from the other party its reasonable attorney's fees and costs at both the trial and appellate level. In the event that any provision of this Note 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 unenforceability of any other provision of this Note in any other jurisdiction. Nothing contained herein shall be deemed or operate to preclude the Holder from bringing suit or taking other legal action against the Borrower in any other jurisdiction to collect on the Borrower's obligations to Holder, to realize on any collateral or any other security for such obligations, or to enforce a judgment or other decision in favor of the Holder. **This Note shall be deemed an unconditional obligation of Borrower for the**

payment of money and, without limitation to any other remedies of Holder, may be enforced against Borrower by summary proceeding pursuant to New York Civil Procedure Law and Rules Section 3213 or any similar rule or statute in the jurisdiction where enforcement is sought. For purposes of such rule or statute, any other document or agreement to which Holder and Borrower are parties or which Borrower delivered to Holder, which may be convenient or necessary to determine Holder's rights hereunder or Borrower's obligations to Holder are deemed a part of this Note, whether or not such other document or agreement was delivered together herewith or was executed apart from this Note.

6.8 Waiver of Jury Trial. TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, BORROWER AND THE HOLDER EACH HEREBY KNOWINGLY, VOLUNTARILY, INTENTIONALLY AND IRREVOCABLY WAIVE THEIR RIGHT TO A JURY TRIAL OF ANY CLAIM OR CAUSE OF ACTION ARISING OUT OF OR BASED UPON THIS AGREEMENT OR ANY CONTEMPLATED TRANSACTION, OR ANY COURSE OF CONDUCT, COURSE OF DEALING, STATEMENTS (WHETHER VERBAL OR WRITTEN) OR ACTIONS OF OR BETWEEN ANY PARTY HERETO, INCLUDING CONTRACT, TORT, BREACH OF DUTY AND ALL OTHER CLAIMS. THE BORROWER AGREES AND CONSENTS TO THE GRANTING TO HOLDER OF RELIEF FROM ANY STAY ORDER WHICH MIGHT BE ENTERED BY ANY COURT AGAINST HOLDER AND TO ASSIST HOLDER IN OBTAINING SUCH RELIEF. THIS WAIVER IS A MATERIAL INDUCEMENT FOR BOTH PARTIES TO ENTER INTO THIS AGREEMENT. EACH PARTY HAS REVIEWED THIS WAIVER WITH ITS COUNSEL. THE BORROWER'S REASONABLE RELIANCE UPON SUCH INDUCEMENT IS HEREBY ACKNOWLEDGED.

6.9 Certain Amounts. Whenever pursuant to this Note the Borrower is required to pay an amount in excess of the outstanding principal amount (or the portion thereof required to be paid at that time) plus accrued and unpaid interest plus Default Interest on such interest, the Borrower and the Holder agree that the actual damages to the Holder from the receipt of cash payment on this Note may be difficult to determine and the amount to be so paid by the Borrower represents stipulated damages and not a penalty and is intended to compensate the Holder in part for loss of the opportunity to convert this Note and to earn a return from the sale of shares of Common Stock acquired upon conversion of this Note at a price in excess of the price paid for such shares pursuant to this Note. The Borrower and the Holder hereby agree that such amount of stipulated damages is not plainly disproportionate to the possible loss to the Holder from the receipt of a cash payment without the opportunity to convert this Note into shares of Common Stock. To the extent it may lawfully do so, the Borrower hereby agrees not to insist upon or plead or in any manner whatsoever claim, and will resist any and all efforts to be compelled to take the benefit or advantage of, usury laws wherever enacted, now or at any time hereafter in force, in connection with any claim, action or proceeding that may be brought by the Holder in order to enforce any right or remedy under this Note.

6.10 Usury Savings Clause. Borrower and Holder intend to contract in compliance with all state and federal usury laws governing the loan evidenced by this Note. Holder and Borrower agree that none of the terms of this Note shall be construed to require payment of interest at a rate in excess of the maximum interest rate allowed by any applicable state, federal or foreign usury laws. If Holder receives sums which constitute interest that would otherwise increase the effective interest rate on this Note to a rate in excess of that permitted by any applicable law, then all such sums constituting interest in excess of the maximum lawful rate shall at Holder's option either be credited to the payment of principal or returned to Borrower.

Notwithstanding any provision in this Note to the contrary, the total liability for payments of interest and payments in the nature of interest, including, without limitation, all charges, fees, exactions, or other sums which may at any time be deemed to be interest, shall not exceed the limit imposed by the usury laws of the jurisdiction governing this Note or any other applicable law. In the event the total liability of payments of interest and payments in the nature of interest, including, without limitation, all charges, fees, exactions or other sums which may at any time be deemed to be interest, shall, for any reason whatsoever, result in an effective rate of interest, which for any month or other interest payment period exceeds the limit imposed by the usury laws of the jurisdiction governing this Note, all sums in excess of those lawfully collectible as interest for the period in question shall, without further agreement or notice by, between, or to any party hereto, be applied to the reduction of the outstanding principal balance due hereunder immediately upon receipt of such sums by the Holder hereof,

with the same force and effect as though the Borrower had specifically designated such excess sums to be so applied to the reduction of the principal balance then outstanding, and the Holder hereof had agreed to accept such sums as a penalty-free payment of principal; provided, however, that the Holder may, at any time and from time to time, elect, by notice in writing to the Borrower, to waive, reduce, or limit the collection of any sums in excess of those lawfully collectible as interest, rather than accept such sums as a prepayment of the principal balance then outstanding. It is the intention of the parties that the Borrower does not intend or expect to pay, nor does the Holder intend or expect to charge or collect any interest under this Note greater than the highest non-usurious rate of interest which may be charged under applicable law.

6.11 Maximum Payments. Nothing contained herein shall be deemed to establish or require the payment of a rate of interest or other charges in excess of the maximum rate permitted by applicable law. In the event that the rate of interest required to be paid or other charges hereunder exceed the maximum rate permitted by applicable law, any payments in excess of such maximum rate shall be credited against amounts owed by the Borrower to the Holder and thus refunded to the Borrower, the manner of handling such excess to be at the Holder's election.

6.12 Further Assurances. At any time or from time to time after the date hereof, the Parties agree to cooperate with each other and, at the request of any other Party, to execute and deliver any further instruments or documents and to take all such further action as the other Party may reasonably request in order to evidence or effectuate the consummation of the transactions contemplated hereby and to otherwise carry out the intent of the Parties hereunder.

6.13 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 inequity, 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.

6.14 No Impairment. The Borrower will not, by amendment of its Articles of Incorporation or By-Laws or other organizational document, or through reorganization, consolidation, merger, dissolution, issue or sale of securities, sale of assets or any other voluntary action, willfully avoid or seek to avoid the observance or performance of any of the terms of this Note, but will at all times in good faith assist in the carrying out of all such terms and in the taking of all such action as may be necessary or appropriate in order to protect the rights of the Holder under this Note against impairment or dilution.

6.15 Substitute Note or Notes. Upon (i) receipt by the Borrower of evidence reasonably satisfactory to it of the ownership of and the loss, theft, destruction or mutilation hereof, and, in the case of loss, theft or destruction, of any indemnification undertaking by the Holder to the Borrower in customary form, or (ii) the request of the Holder of this Note upon surrender hereof, the Borrower shall execute and deliver in lieu hereof, a new Note or Notes, payable to the order of the Holder or such persons as the Holder may request and in a principal amount equal to the unpaid principal amount hereof, which shall be dated and bear interest from the date to which interest has theretofore been paid hereon. Each such Note shall in all other respects be in the same form and be treated the same as this Note and all references herein to this Note shall apply to each such Note. This Note is exchangeable, upon the surrender hereof by the Holder at the principal office of the Borrower, for a new Note or Notes representing in the aggregate the outstanding Principal of this Note, and each such new Note will represent such portion of such outstanding Principal as is designated by the Holder at the time of such surrender.

6.16 Absolute Obligation. No provision of this Note shall alter or impair the obligation of the Borrower, which is absolute and unconditional, to pay the principal of, accrued interest, Default Amounts, or damages as applicable, on this Note at the time, place, and rate, and in the coin or currency, herein prescribed. This Note is a direct, unconditional and secured debt obligation of the Borrower.

6.17 Relationship. The relationship of the parties to this Note is determined solely by the provisions of this Note. The parties do not intend to create any agency, partnership, joint venture, trust, fiduciary or other relationship with duties or incidents different from those of parties to an arm's-length contract.

6.18 Entire Agreement. This Note and any instruments and agreements to be executed pursuant to this Note, sets forth the entire agreement and understanding of the Parties with respect to its subject matter of this Note and supersedes, merges and replaces all prior and contemporaneous understandings, discussions and negotiations, oral or written, regarding the same subject matter which shall remain in full force and effect and may not be altered or modified, except in writing and signed by the party to be charged thereby, and supersedes any and all previous discussions between the parties relating to the subject matter thereof.

6.19 Counterparts. This Note may be executed in two or more counterparts, all of which when taken together shall be considered one and the same agreement and shall become effective when this Note has been signed by the Borrower and delivered to any other party, it being understood that all parties need not sign the same counterpart. In the event that any signature is delivered by facsimile transmission, by email in "portable document format" (".pdf"), electronic signature or other similar electronic means intended to preserve the original graphic and pictorial appearance of this Note, such signature shall have the same effect as physical delivery of the paper document bearing original signature and create a valid and binding obligation of the party executing (or on whose behalf such signature is executed) the same with the same force and effect as if such facsimile signature were an original thereof.

6.20 Counsel. The parties expressly acknowledge that each has been advised to seek separate counsel for advice in this matter and has been given a reasonable opportunity to do so.

6.21 Headings. The headings in this Note are for convenience of reference only and shall not affect the interpretation of this Note.

[Signatures on Following Pages]

IN WITNESS WHEREOF, Borrower has caused this Promissory Note to be signed in its name by anauthorized officer as of the first date written above.

ASCENT SOLAR TECHNOLOGIES, INC.

By: /s/ Victor Lee

Name: Victor Lee

Title: President & CEO

EXHIBIT A
ASCENT SOLAR TECHNOLOGIES, INC.

NOTICE OF CONVERSION
(To be Executed by the Registered Holder in order to
Convert the Note)

The undersigned hereby irrevocably elects to convert the sum of: \$_____ principal amount due under the terms of the Note (defined below) into shares of common stock, par value \$0.0001 per share (“**Common Stock**”), of **ASCENT SOLAR TECHNOLOGIES, INC.** a Delaware corporation (the “**Borrower**”) according to the conditions of the Unsecured Convertible Promissory Note of the Borrower dated as of _____ (the “**Note**”), as of the date written below. If securities are to be issued in the name of a person other than the undersigned, the undersigned will pay all transfer taxes payable with respect thereto and is delivering herewith such certificates. No fee will be charged to the Holder for any conversion, except for transfer taxes, if any. A copy of each Note is attached hereto (or evidence of loss, theft or destruction thereof).

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: _____ DTC#: _____
Account Number: _____ Name: _____

In lieu of receiving shares of Common Stock issuable pursuant to this Notice of Conversion by way of a DWAC Transfer, 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:

Name: _____
Address: _____

The undersigned represents and warrants that all offers and sales by the undersigned of the securities issuable to the undersigned upon conversion of the Note shall be made pursuant to registration of the securities under the Securities Act of 1933, as amended (the “**Act**”), or pursuant to an exemption from registration under the Act.

Date of Conversion: _____
Conversion Price: _____
Applicable Conversion Discount: _____
Conversion Shares: _____
Default Sums/Damages Shares: _____
Total number of Shares of Common Stock to be Issued Pursuant
To the terms of the Notes: _____
Conversion Shares to be Registered to the Following: _____
Name: _____
Address: _____
Address: _____

[NAME OF HOLDER]

By: _____
Name: _____
Title: _____

The Borrower hereby acknowledges this Notice of Conversion and agrees to direct the Borrower’s Transfer Agent to issue the above indicated number of shares of Common Stock.

ASCENT SOLAR TECHNOLOGIES, INC.

By: _____
Name: _____
Title: _____

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 14, 2022 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, 2021.

/s/ Haynie & Company

Haynie & Company
Salt Lake City, Utah
March 14, 2022

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.

March 14, 2022

/s/ VICTOR LEE

Victor Lee

President and Chief Executive Officer

(Principal Executive 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, Michael J. Gilbreth, 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.

March 14, 2022

/s/ MICHAEL J. GILBRETH

Michael J. Gilbreth

Chief 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, 2021 as filed with the Securities and Exchange Commission on the date therein specified (the “Report”), I, Victor Lee, President and Chief Executive 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, to my knowledge:

- (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.

March 14, 2022

/s/ VICTOR LEE

Victor Lee
President and Chief Executive Officer
(Principal Executive 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, 2021 as filed with the Securities and Exchange Commission on the date therein specified (the “Report”), I, Michael Gilbreth, Chief 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, to my knowledge:

- (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.

March 14, 2022

/s/ MICHAEL J. GILBRETH

Michael J. Gilbreth
Chief Financial Officer
(Chief Accounting Officer and Authorized Signatory)