Annual Report
2019

Use of Forward-Looking Statements

This presentation contains forward-looking statements made pursuant to the Safe Harbor provisions of the Private Securities Litigation Reform Act of 1995, including but not limited to statements concerning future financial performance; the capabilities and performance of our current and future technology and products; our business strategies, including anticipated trends, growth, and developments in markets in which we target, and our entry into digital commerce; the anticipated market adoption of our current and future products; the value of our products, including reduction in logistic costs for our partners; and our performance in operations, including component supply management, product quality, and customer service. These forward-looking statements are based upon current expectations that involve risks and uncertainties. Any statements that are not of historical fact, may be forward-looking statements. Words used such as "anticipates," "believes," "continues," "designed," "estimates," "expects," "goal," "intends," "likely," "may," "ongoing," "plans," "projects," "pursuing," "seeks," "should," "will," "would" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these words. All forward-looking statements are based on our current assumptions, expectations and beliefs, and involve substantial risks and uncertainties that may cause results, performance or achievement to materially differ from those expressed or implied by these forward-looking statements. Therefore, you should not place undue reliance on our forward-looking statements. A detailed discussion of risk factors that affect our business is included in the filings we make with the Securities and Exchange Commission (SEC) from time to time, including our most recent report on Form 10-K, particularly under the heading "Risk Factors." Copies of these filings are available on the Enphase website at http://investor.enphase.com/sec.cfm, or on the SEC website at www.sec.gov. All forward-looking statements in this presentation are based on information currently available to us, and we assume no obligation to update these forward-looking statements in light of new information or future events.

Industry Information

Information regarding market and industry statistics in this presentation is based on information available to us that we believe is accurate. It is generally based on publications that are not produced for purposes of economic analysis.

Non-GAAP Financial Metrics

• The Company has presented certain non-GAAP financial measures in this presentation. Generally, a non-GAAP financial measure is a numerical measure of a company's performance, financial position, or cash flows that either excludes or includes amounts that are not normally excluded or included in the most directly comparable measure calculated and presented in accordance with generally accepted accounting principles in the United States of America, or GAAP. Reconciliation of each non-GAAP financial measure to the most directly comparable GAAP financial measure can be found in the Appendix to this presentation. Non-GAAP financial measures presented by the Company include non-GAAP gross profit, gross margin, operating expenses, income from operations, net income (loss) and net income (loss) per share.

• These non-GAAP financial measures do not reflect a comprehensive system of accounting, differ from GAAP measures with the same captions and may differ from non-GAAP financial measures with the same or similar captions that are used by other companies. In addition, these non-GAAP measures have limitations in that they do not reflect all of the amounts associated with the Company's results of operations as determined in accordance with GAAP. As such, these non-GAAP measures should be considered as a supplement to, and not as a substitute for, or superior to, financial measures calculated in accordance with GAAP. The Company uses these non-GAAP financial measures to analyze its operating performance and future prospects, develop internal budgets and financial goals, and to facilitate period-to-period comparisons. The Company believes that these non-GAAP financial measures reflect an additional way of viewing aspects of its operations that, when viewed with its GAAP results, provide a more complete understanding of factors and trends affecting its business.

• As presented in the "Reconciliation of Non-GAAP Financial Measures" table in the Appendix to this presentation, each of the non-GAAP financial measures excludes one or more of the following items for purposes of calculating non-GAAP financial measures to facilitate an evaluation of the Company's current operating performance and a comparison to its past operating performance:

• Stock-based compensation expense. The Company excludes stock-based compensation expense from its non-GAAP measures primarily because they are non-cash in nature. Moreover, the impact of this expense is significantly affected by the Company's stock price at the time of an award over which management has limited to no control.

• Restructuring charges. The Company excludes restructuring charges due to the nature of the expenses being unplanned and arising outside the ordinary course of continuing operations. These costs primarily consist of fees paid for restructuring-related management consulting services, cash-based severance costs and modification of stock-based compensation related to workforce reduction actions, asset write-downs of property and equipment and lease loss reserves, and other contract termination costs resulting from restructuring initiatives.

• Reserve for non-recurring legal matter. This item represents a charge taken for the potential settlement cost related to a dispute with a vendor. This item is excluded as it relates to a specific matter and is not reflective of the Company's ongoing financial performance.

• Acquisition related expenses and amortization. This item represents expenses incurred related to the Company's acquisition of SunPower's microinverter business, which are non-recurring in nature, and amortization of acquired intangible assets, which is a non-cash expense. Acquisition related expenses and amortization of acquired intangible assets are not reflective of the Company's ongoing financial performance.

• Non-recurring debt prepayment fees and non-cash interest. This item consists primarily of amortization of debt issuance costs, accretion of debt discount and non-recurring debt settlement costs, because these expenses does not represent a cash outflow for the Company except in the period the financing was secured or when the financing was settled, and such amortization expense or settlement of debt costs is not reflective of the Company's ongoing financial performance.

• Non-GAAP income tax adjustment. This item represents the amount adjusted to the Company's GAAP tax provision or benefit to present the non-GAAP tax amount based on cash tax expense and reserves.

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Encharge 3 battery system
Empower smart switch
Encharge 10 battery system

Badri Kothandaraman
President and CEO

"COVID-19 is redefining how we work and how we interact with each other."

Dear fellow shareholders,

What a beginning to the year!

The whole world has been turned upside down in just three months. COVID-19 is redefining how we work and how we interact with each other. The details of the Coronavirus are still emerging – how it originates, how it spreads and who it affects. Until we have effective prevention and control mechanisms in place, it seems that social distancing and working from home will continue to be the new norm for a period of time. Travel has come to a standstill and commerce is significantly impacted.

Although the picture today is gloomy, we hope our collective strength in the face of adversity will give rise to new findings in medicine and new ways of doing business. At this point, we can all build resilience by having a positive mindset, staying healthy, connecting socially while practicing physical distancing, and figuring out unconventional ways for work to continue. In this spirit and backdrop, this letter highlights our 2019 accomplishments and 2020 priorities.

The personal side

First, a brief history about me and the circumstances under which I joined Enphase Energy. I was born and raised in Chennai, India from 1971 to 1993. Education was a high priority for my parents, and despite being a middle-class family, they ensured that my sister and I attended the best schools. After completing my bachelor's degree from the Indian Institute of Technology, Chennai, I boarded my first airplane flight in 1993 to attend graduate school in the U.S.

In 1995, after completing my master's degree in materials science from U.C. Berkeley, I began working at Cypress Semiconductor as a sustaining engineer in the Fab. During the course of a 21-year career at Cypress, I worked in process technology and chip design, eventually landing in general management where I managed multiple memory, USB and IoT businesses. I have always been a strong analytical thinker and am very detail oriented, but perhaps the biggest skill I acquired in my 21 years at Cypress was building scalable business processes.

In late 2016, I decided to leave Cypress and try something new. I was enjoying my new-found freedom and dabbling with a startup until March 2017, when I had the opportunity to meet with Enphase.

"By Q3'18, we were increasingly profitable and gross margin had climbed to more than 30%."

The context leading to 2019

During my initial meeting at Enphase, it became obvious that Enphase was special. I was shown the IQ 6™ microinverter, which I viewed as an engineering marvel of a microinverter that produced 300W of AC power with a form factor just a little larger than the iPhone plus. This sleek device not only had incredible power density but was capable of working on the roof in the harshest of conditions for 25 years!

I decided to join the talented Enphase team in April 2017, and the hard work ahead was cut out for us. The company was not doing well financially, despite its strong technology and products. The main problem was the lack of operational discipline; we had to stop the bleeding.

We stopped accepting unprofitable business, started pricing products based on value, worked on reducing costs, and became laser-focused on conserving cash. We were fortunate to have an amazingly loyal customer base that absolutely loved our products. We worked hard, began turning the corner and in Q4'17, we were break-even on a non-GAAP basis. We also increased our focus on customer experience and top line growth.

In Q1'18, we introduced the IQ 7™ microinverter to customers in the U.S. By Q3'18, we were increasingly profitable and gross margin had climbed to more than 30%. A majority of our worldwide shipments was IQ 7 microinverters, and we started seeing a huge uptick in product demand. As a result, we started facing supply constraints in meeting this demand due to component shortages. We ended Q4'18 with GAAP profitability for the first time in the Company's history, and the stage was set for us to fix our supply problems and ramp up business in 2019.

IQ microinverters in a rooftop installation

2019 Performance

2019 exceeded my wildest imagination!

"Our revenue nearly doubled in 2019 to $624.3 million and 2019 was the first full year of GAAP profitability in Enphase's history."

Our revenue nearly doubled in 2019 to $624.3 million, from $316.2 million in 2018. We shipped 6.2 million microinverters in 2019, compared to 2.8 million microinverters in 2018, representing more than a 100% increase. Our non-GAAP gross margin in 2019 was more than 35%[1], compared to 30.2%[1] in 2018, primarily due to great pricing and cost management.

Most of the revenue growth came from North America, where we built a strong sales team focusing on small- and medium-sized installers. I often wonder what caused such explosive growth in such a short time period. I go back to our core differentiation – semiconductor core, software enabled, and Ensemble™ technology – all built on a distributed architecture, which in turn delivers high quality, scalable and easy to support solutions for our installers and homeowners.

Enphase headquarters, Fremont, CA

Distributed architecture is the norm

Our co-founders, Raghu Belur and Martin Fornage, built their careers in the telecommunications industry and strongly believed in the concept of a "distributed" architecture. In network parlance, intelligence gets pushed deeper and deeper into the network with end points making autonomous decisions. This has been shown to be true not only in telecommunications but in other areas too; for example, we have witnessed the move from main frames to PCs and from monolithic computing systems to blade servers in the datacenter, and others.

[1] See Appendix for reconciliation to comparable GAAP Measures

"Enphase microinverters are based on a high-speed digital semiconductor architecture with bi-directional communication, along with gateway and cloud software, forming a true Internet of Things (IoT) system."

IQ 8 microinverter ASIC

The common threads running through these examples are semiconductors and software. Extending a similar approach to solar power conversion could help us build the most flexible, efficient, reliable, and cost-effective power system available. This is the reason why Enphase has designed its microinverters based on a high-speed digital semiconductor architecture with bi-directional communication, along with gateway and cloud software, forming a true Internet of Things (IoT) system.

We have now applied the same distributed architecture to energy storage as well. Both our solar microinverters and battery systems are intelligent end points and make autonomous decisions. Our IP portfolio now includes more than 300 issued patents, and many additional pending, worldwide – a testament to our product innovation.

Our semiconductor architecture digitizes power conversion and integrates more functions

Enphase employs a single-stage resonant converter for its microinverters. This means that power from the DC solar panels is converted directly into AC in a single stage, as opposed to two-stage converters which split the isolation and inversion functions. Physically, the topology consists of a DC-side "Full-Bridge" and an AC-side 4-Quadrant "Half-Bridge" coupled with a high frequency transformer.

By carefully controlling the frequency and relative phase angles of the two bridges, we excite a resonant current that transfers energy between the DC and AC sides of the converter. The direct conversion in a single stage translates to fewer losses and fewer components. The power stage uses just eight transistors (four per bridge) and a single highly optimized high frequency magnetic component; fewer components represent higher reliability and lower costs. The single-stage resonant inverter has many advantages over the conventional two-stage design but is notoriously difficult to control in a direct DC-to-AC inverter application.

Enphase uses a 100% predictive control technique for power conversion. A custom application-specific integrated circuit (ASIC) is used specifically for implementing a fully digital version of this control technique. The ASIC includes a specially designed analog-to-digital converter to measure the resonant tank current with less than 200 nanoseconds of latency while consuming very little power.

Once these critical signals are digitized, the remaining processing can be done real-time using dedicated digital signal processing (DSP) blocks in the ASIC. We have been able to derive a single optimal trajectory by imposing constraints requiring all switching transitions to occur with zero-voltage across the switch (i.e. “zero-voltage-switching”) and maintaining the circulating resonant current as small as possible to achieve the desired power conversion at the lowest possible frequency.

“This pursuit of the ASIC approach has paid Enphase big dividends, as it is efficient, scalable and cost effective for our microinverters.“

This pursuit of the ASIC approach has paid Enphase big dividends, as it is efficient, scalable and cost effective for our microinverters. In every microinverter generation, we have reduced the component count by incorporating more functionality into the ASIC.

IQ 7 has 300+ components as compared to our older 5th generation microinverter with 400+ components. The IQ 8™ microinverter, with its grid-agnostic capability, is about 1,000 times faster in response time as compared to IQ 7. The ASIC incorporated in IQ 8 has substantially more functionality than in IQ 7, including an embedded Arm® processor.

Our first generation microinverter produced 175W of power at approximately 94% efficiency with minimal functionality other than power conversion. In stark comparison, the IQ 7 microinverter operates as high as 366W of power at approximately 97% efficiency with additional analog and digital integration; the IQ 8 microinverter is expected to do even more. This is the true power of a semiconductor-based architecture.

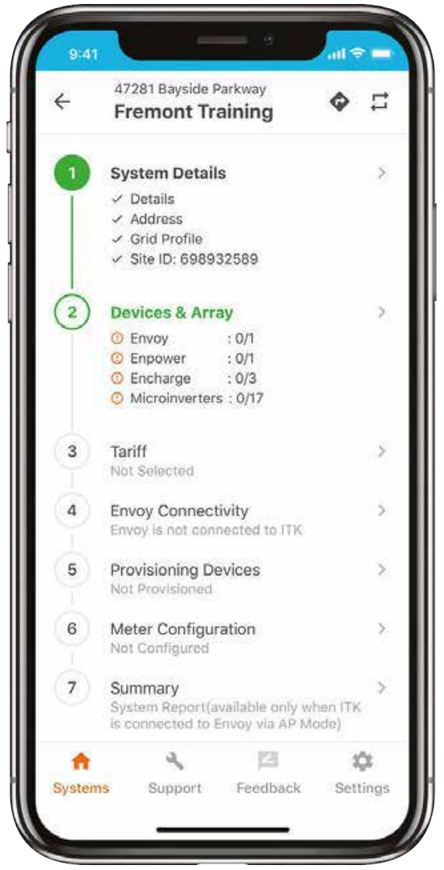
“Our software defined architecture enables us to build a single hardware platform and adapt the operation of the microinverter to the grid requirements.”

Software helps with ultimate flexibility and quality

Every component in our microinverter system is defined by software. It begins with firmware stored in the flash memory of our microinverter that defines the basic operation and safe operating zones for abnormal grid events. Our software defined architecture enables us to build a single hardware platform and adapt the operation of the microinverter to the grid requirements of each geography, utility and even to each home.

For example, regardless of whether the microinverter operates in the U.S. at 240V-60Hz, Line-Line, or in Europe at 230V-50Hz, Line-Neutral, we use the same hardware. Furthermore, the unique grid requirements, such as in California or Hawaii, are accomplished by an operating profile that is also configured by software.

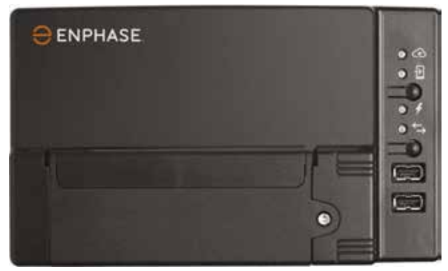
We have applied similar thinking as we move into our energy storage systems. For example, beginning with our sixth generation microinverter, power conversion has been bi-directional. This means that we can have power flow from DC to AC to act like an inverter, or control power flow from AC to DC to act like a charge controller for our storage systems – all accomplished with the same hardware platform and a minor modification in software. This gives us incredible flexibility to manage our supply chain.



Enphase Installer Toolkit is used to easily setup, manage and monitor all aspects of solar and storage systems

The Envoy™ is our gateway, a device that controls and communicates with the microinverters and batteries. The Envoy also communicates real-time with our proprietary Enlighten™ cloud platform. The communication between the Envoy and microinverters is achieved over the AC powerline through power line communication, or PLC, without the need for additional wires.

The communication to the cloud is accomplished either over the homeowner's broadband network or an independent cellular network. In addition to communication, the Envoy provides metering capability to measure both energy production and consumption in a home. The Enlighten cloud monitors the critical parameters of the solar system.



IQ Envoy communication gateway

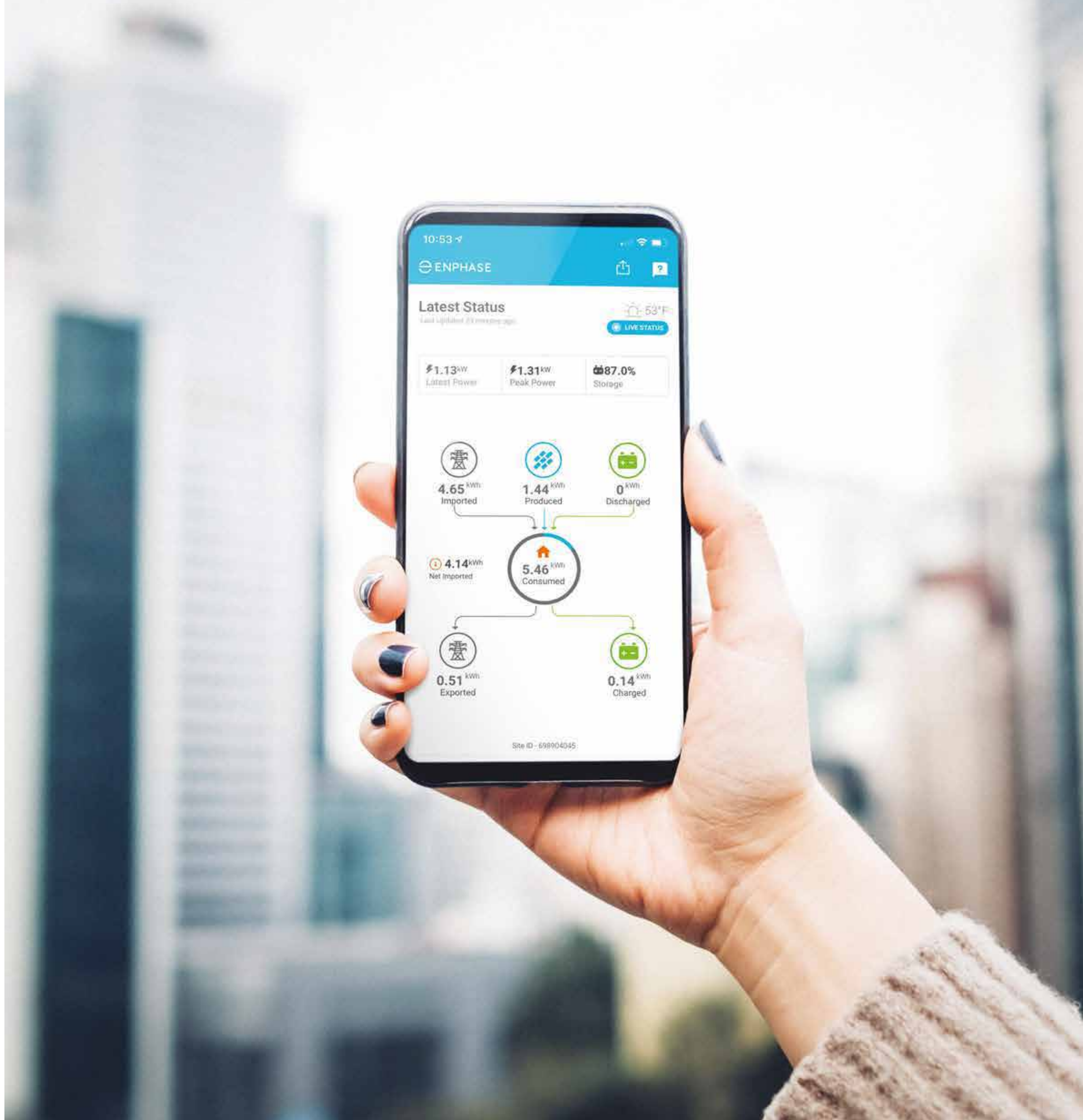
Today, Enphase microinverters are deployed in more than one million installations which send real-time data back to the Enlighten cloud system. In the past few years, we have enabled customers to monitor their own consumption through the Enlighten mobile app. Enlighten collects as much as 3GB to 4GB of data per day, which is invaluable to our customer service team to monitor and determine the health of the microinverters should issues arise. The ability to analyze microinverter data under various operating conditions in great detail can also be used by our engineering teams to improve the quality of microinverters from one generation to the next.

"Today, Enphase microinverters are deployed in more than one million installations which send real-time data back to the Enlighten cloud system."

Finally, the communication between the microinverter system and the cloud is bi-directional. This means that not only can the microinverters send data to the cloud, but the cloud can also send data to the microinverters. This allows us to future-proof our systems by enabling the remote upgrading of our microinverters - a feature called over-the-air software upgrade. Solar systems today are designed to last over 25 years. It is unrealistic to think that operating conditions will not change over that time.

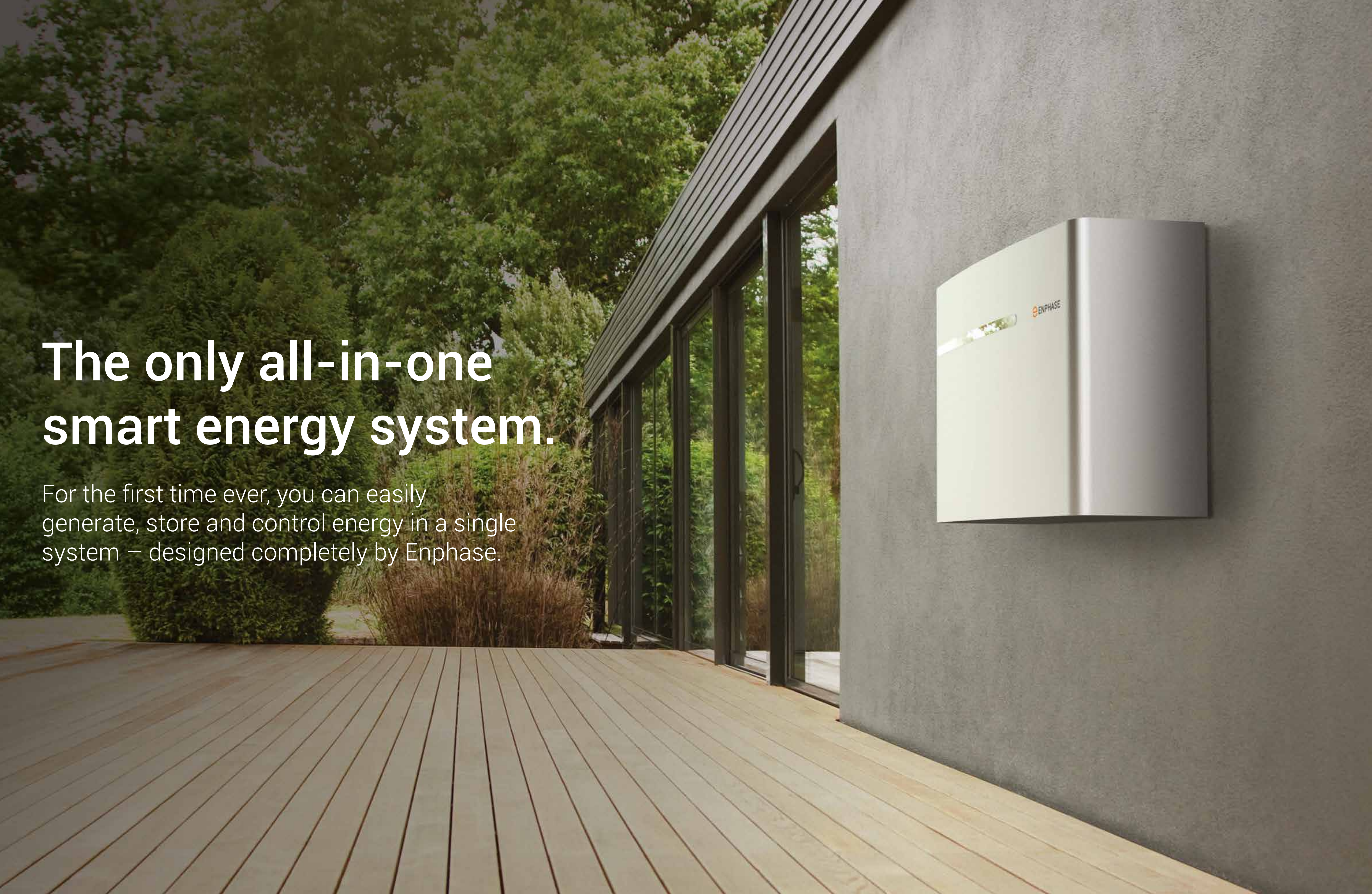
For example, electrical grid, weather, load, regulations, and tariffs are all subject to change. A combination of software-defined hardware and over-the-air software upgrade capabilities make the systems in the field remotely upgradeable without requiring our installer partners to do in-person site visits, helping to greatly improve operational efficiency.

All the power
In the palm of your hand



The only all-in-one smart energy system.

For the first time ever, you can easily generate, store and control energy in a single system – designed completely by Enphase.



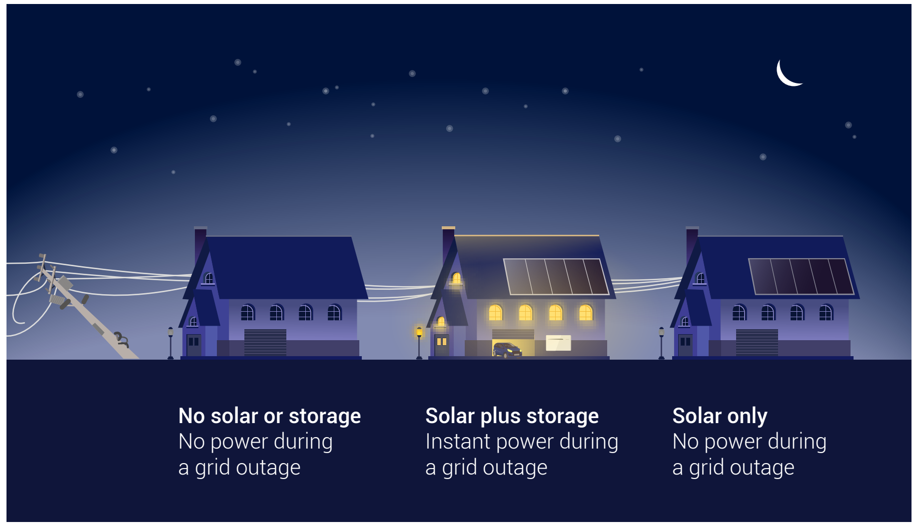
Ensemble is a game changer

One of Solar's biggest challenges is that it is "grid-tied." This means that for solar systems today, if the grid fails or is off-line, there will be no production out of the solar system, even if the sun is still shining. To address this limitation, we invented Ensemble technology, an energy management technology that is completely grid agnostic.

"We invented Ensemble, an energy management technology that is completely grid agnostic, enabling solar systems to operate even in the absence of a grid."

In the event of a grid failure, the solar system with Ensemble technology will form its own microgrid for the home. The Ensemble system uses a three-tiered hierarchical control architecture, similar to that of the conventional utility grid. The three tiers work together to create a robust flexible power system that is designed to respond quickly to fluctuating demands while coordinating power flow to minimize cost of operation.

The first tier in this system, "primary control", is accomplished with the embedded digital signal processor (DSP) within our ASIC in the microinverter. It is an autonomous tier that uses local voltage and frequency to balance instantaneous generation and load via a governing response, and does not rely on communication, making it fast and reliable. In addition, a high-speed brownout capability is integrated into the primary control system. When a microinverter determines that it is operating at its limit, it augments the primary response in order to keep operating within its designed envelope. This system is useful to manage load inrush from motors and heaters. When grid-tied, microinverters operate exactly how they do today, with the voltage and frequency controlled by the utility.



Enphase Always-On systems keep the power on, even when the grid is down

While the primary controller provides a proportional response to changes in load which create deviations in voltage and frequency, these deviations are removed using "secondary control". The Ensemble secondary controller resides in the Envoy and broadcasts PLC and ZigBee™ messages which are received by the microinverter fleet. These messages contain biases to the primary control equations in order to maintain a certain quality of service.

When operating off-grid, this objective is to maintain a specific voltage and frequency target. For example, when a load turns on, the voltage and frequency drops until enough primary control response is triggered to meet the new demand. This is often referred to as the "governing response" of the system. The Envoy gateway observes the reduced voltage and frequency and broadcasts new bias terms to the microinverter fleet in order to restore the target system voltage and frequency.

"Tertiary control" is the third tier with the objective of "economic optimization", which means optimizing the energy flow among resources such that the load is serviced at the lowest cost. This occurs when the "marginal cost of energy delivered" is equalized among all resources. This controller, which resides in our cloud system Enlighten, collects telemetry data in order to calculate marginal cost curves for all resources within its jurisdiction. It then calculates the required tertiary biases that will equalize the marginal costs among all the resources and multi-casts these tertiary biases to each resource.

Quality is the bedrock of the Enphase design

"Quality is at the heart of everything we do."

Quality is at the heart of everything we do. We are passionate about building products that people can count on for 25 years and in the harshest of climate conditions. As previously noted, our single stage architecture results in a reduced number of components with higher efficiency, leading to lesser power dissipation. The fewer number of components, the higher the intrinsic quality of the microinverter. Our target is to achieve less than 500 defective parts per million (DPPM), which translates to a failure rate of less than 0.05%, shipped on an annualized basis. This requires constant fleet monitoring to detect problems, assembling a cross-functional task force to review quality on a regular basis, and using the 8D method of problem solving.

Enlighten monitoring platform

For example, we recently had an issue where homes in a particular region with a unique weather pattern stopped producing solar power. Our Always-On strategy ensures that Enphase-based systems are connected to the Enlighten cloud and can be monitored 24-7. Therefore, our fleet monitoring team was able to isolate the exact conditions under which this problem occurred. This enabled us to quickly replicate the problem in our R&D lab and the root cause pointed to a defective component. With our multi-sourcing approach, we were able to initiate the switch to a different component supplier immediately.

As for the fleet, we were able to come up with a software fix which runs in the background and prevents these power downs. In addition, we were able to incorporate the unique failure mechanism in our reliability suite of tests. This example demonstrates the power of our software-defined architecture and cross-functional problem-solving capabilities. Due to such excellent collaboration within our teams, we were able to drop the IQ 7 DPPM by nearly a third during 2019, enabling us to get closer to our 500 DPPM target.

Customer service is our strength

"When a customer calls, you jump." This has been our mantra for the past few years since I have built our leadership team. Our installed base is steadily growing and is now more than one million installations. While we welcome calls from homeowners and installers, we strive to provide a superior customer experience so that calls are not necessary in the first place. The name of the game is how to make it "bone simple" for the customer. We strive to get progressively better through the use of technology and self-service options, such as our upcoming online community and other features.

"Our worldwide Net Promoter Score (NPS) increased from 37% in 2018 to 52% in 2019."

We are proud that our customer contact centers in Idaho, Australia, France, and India have ramped up well to achieve high levels of customer satisfaction. Our worldwide Net Promoter Score (NPS) increased from 37% in 2018 to 52% in 2019. We drove down our mean call wait time to approximately 1.3 minutes by Q4'19. Our goal is to be under one minute, and we have initiatives in 2020 to help us achieve that. Our installed base represents many potential service opportunities, including solar and storage upgrades. We are scratching the surface on understanding the homeowner experience through our legacy product upgrade program, with more than 7,200 homeowners having participated in the program by the end of 2019. We also introduced the Enphase e-commerce store in the U.S. based on feedback from customers who want a quick access to products that are hard to find through traditional channels.

"Our microinverter shipments increased every quarter in 2019, accelerating from approximately 820,000 units in Q4'18 to 2.1 million units in Q4'19."

Our operations team did an outstanding job in 2019

In prior sections of this letter, I highlighted our technological core differentiation as well as our customer experience focus. It would be remiss on my part to not recognize our operational excellence. Our microinverter shipments increased every quarter in 2019, accelerating from approximately 820,000 units in Q4'18 to 2.1 million units in Q4'19. We had a big challenge to meet customer demand, particularly in the first half of 2019. We used a multi-sourcing approach along with our efficient OpEx-Lite and CapEx-Lite model. We forged strong power transistor partnerships, which helped us immensely to secure power transistor capacity in Q4'18 and increase it further throughout 2019. We worked with our contract manufacturer to add microinverter capacity in Mexico as mitigation to the Section 301 Tariffs, which increased to 25% in 2019. We were able to increase our total microinverter manufacturing capacity to 2.5 million units in Q4'19, with 500,000 units coming from Mexico, and all with modest increases to our capital expenditures and operating expenses. In addition, we scaled our supply chain business processes and organization to improve on-time delivery to approximately 99% by the end of Q4'19.

IQ 7XS™ microinverters integrated into SunPower® X-Series solar modules

Our new product performance was okay, not stellar

New products are our life blood. If it had not been for the IQ product family, Enphase would be in a different place today. Fortunately, the best is yet to come! We have a compelling differentiation with Ensemble energy management technology and a multi-year product roadmap that is laid out clearly in front of us. Our engineering teams in India, New Zealand and the U.S. spent the bulk of 2019 getting up to speed on Ensemble technology and battery storage products. If there is one thing we could do better, it is getting new products out faster.

IQ 7A microinverter

"Our Encharge storage system represents a transformative opportunity to increase our revenue potential per home from approximately $2,000 to $10,000."

Let's look at what we did in 2019. The IQ 7 family of microinverters are our smallest, lightest and most powerful microinverters, and were instrumental in improving our non-GAAP gross margin to 35.7% in 2019. Approximately 98% of our total shipments are in 3 flavors of the IQ 7 – IQ 7, IQ 7+™ and IQ 7X™. We released our highest power microinverter, IQ 7A™ for 450W DC modules during the latter part of 2019. Solar installers can pair the IQ 7A microinverter with mono-facial or bifacial solar modules, up to 450W. We are working on further reducing our cost per watt by leveraging our semiconductor integration, power expertise and economies of scale. We continue to work closely with our AC module (ACM) partners, most notably SunPower, to develop ACMs which help create value through reduced logistics costs and faster installation times.

A critical driver for our profitable top line growth is storage. Our Encharge™ storage system based on Ensemble technology represents a transformative opportunity to increase our revenue potential per home from approximately $2,000 to $10,000. Encharge storage systems have usable capacities of 3.4 kWh and 10.1 kWh, helping to keep homes powered when the grid goes down, and saving money when the grid is up. These systems are compatible with both new and existing Enphase IQ™ solar systems with IQ 6 or IQ 7 microinverters, providing a simple upgrade path for existing customers. We expect to ramp up our Encharge 3™ and Encharge 10™ storage systems for North American customers in 2020.

35-15-20 is our new financial model

We surpassed our original 30-20-10 target financial model handily for most of 2019; 30-20-10 stands for 30% gross margin, 20% operating expenses, and 10% operating income, all as a percentage of revenue on a non-GAAP basis. At our Analyst Day in December 2019, we introduced a new baseline financial model of 35-15-20. This baseline model represents the minimum financial performance we expect to achieve over the next 24 months, while demonstrating profitable topline growth. Our 2019 GAAP net income was $161.1 million, resulting in diluted earnings per share of $1.23. It should be noted that 2019 was the first full year of GAAP profitability in Enphase's history. Our non-GAAP net income was $124.2 million, resulting in non-GAAP diluted earnings per share of $0.95.[1]

[1] See Appendix for reconciliation to comparable GAAP Measures

"The potent combination of the IQ 7 family of products along with great customer experience was the biggest reason for our financial success in 2019."

We executed on all the priorities I highlighted in my letter a year ago

In conclusion, we had a great 2019 on many fronts. We improved leaps and bounds on customer experience, instituted many business processes in operations and new product development, and executed well on our growth vectors. If I were to summarize it in one sentence, the potent combination of the IQ 7 family of products along with great customer experience was the biggest reason for our financial success in 2019. We had 577 full-time employees at the end of 2019, and I am proud of all their hard work and dedication.

Performance metrics

Below is a recap of our financial performance in 2019 as compared with 2018. Dollars are represented in thousands, except per-share data and percentages:

	GAAP			
	2019		2018	
Revenue	$	624,333	$	316,159
Gross margin		35.4 %		29.9 %
Operating expense		19.0 %		29.4 %
Operating income	$	102,729	$	1,596
Net income (loss)	$	161,148	$	(11,627)
Basic EPS	$	1.38	$	(0.12)
Diluted EPS	$	1.23	$	(0.12)

	Non-GAAP [1]			
	2019		2018	
Revenue	$	624,333	$	316,159
Gross margin		35.7 %		30.2 %
Operating expense		15.4 %		23.7 %
Operating income	$	126,592	$	20,535
Net income	$	124,205	$	10,013
Basic EPS	$	1.06	$	0.10
Diluted EPS	$	0.95	$	0.10

[1] See Appendix for reconciliation to comparable GAAP measures

Our 2020 priorities

“We will continue with our mission to deliver technology solutions that make clean energy affordable, reliable and accessible to all.“

Our solid execution in 2019 has positioned us well with a solid financial foundation. As we move into 2020, our focus is on the following priorities that will help us to further service homeowners and fuel profitable growth.

Reinforce remarkable customer experiences

Quality and customer service constitute customer experience. This has been a priority at Enphase for the past three years. We believe that great companies have a level of consistency that goes beyond goals and have quality and service ingrained into their culture. “Customer First” is Enphase's first core value. Our goals are to partner with installers and distributors so that we can provide exceptional service to homeowners and business owners. We are doing well in the U.S.; we are intensifying our focus on the international regions like Europe and Australia. We significantly increased our headcount in these regions going into 2020. We are convinced that continued reinforcement of customer experience will be a huge competitive advantage.

Introduce new products and expand our market

IQ 8D microinverter for the small commercial market

After the market release of the Encharge storage system, we expect to release the grid-agnostic IQ 8 photovoltaic (PV) product for residential solar applications followed by the IQ 8D™ microinverter product for the small commercial solar market and the Ensemble-in-a-Box™ product for the India off-grid market. We believe this will increase our serviceable available market (SAM) from $3.3 billion in 2020 to $12.5 billion in 2022, providing an opportunity for meaningful topline growth and profitability. Every one of these products leverages our core differentiation of semiconductors, software and Ensemble.

Leverage digital transformation

Today, we are engaged digitally with our installed base of more than one million sites through the Enlighten mobile and desktop applications, putting us in a unique position to understand their energy needs. Similarly, we work very closely with a few thousand installers every year. By developing a comprehensive digital platform on which the homeowner, installer and Enphase can interact, we can significantly enhance the experience for all parties. This is a multi-year activity for which we expect to make significant progress in 2020.

Final thoughts

We are looking forward with a clear focus on growth fueled by continuing innovation. We have a very strong balance sheet that enables us to weather adverse situations as well as capitalize on future opportunities. We are rapidly transitioning from being a solar microinverter systems company to an energy management systems company. We believe we can have the biggest impact on the planet by pursuing our mission to bring solar and storage solutions mainstream.

As I write this letter, the world continues to be impacted by the Coronavirus pandemic. Our topmost priority is to ensure the health and safety of our employees, customers and partners. We are doing everything possible to ensure uninterrupted supply and support of our high-quality products to customers and partners.

I would like to thank our employees for their hard work, and our customers, partners and shareholders for their strong support. You have my word that we will continue with our mission to deliver technology solutions that make clean energy affordable, reliable and accessible to all.

To be continued,

Badri Kothandaraman
President and CEO

Appendix

Enphase Energy, Inc. reconciliation of Non-GAAP financial measures

In thousands, except per share data and percentages. (Unaudited)	Year Ended December 31, 2019	Year Ended December 31, 2018
Gross profit (GAAP)	$ 221,245	$ 94,445
Stock-based compensation	1,650	1,071
Gross profit (Non-GAAP)	$ 222,895	$ 95,516
Gross margin (GAAP)	35.4 %	29.9 %
Stock-based compensation	0.3 %	0.3 %
Gross margin (Non-GAAP)	35.7 %	30.2 %
Operating expenses (GAAP)	$ 118,516	$ 92,849
Stock-based compensation	(17,791)	(10,361)
Restructuring and asset impairment charges	(2,599)	(4,128)
Reserve for non-recurring legal matter	—	(1,765)
Acquisition related expenses and amortization	(2,183)	(1,614)
Operating expenses (Non-GAAP)	$ 95,943	$ 74,981
Operating expense % of revenue	15.4 %	23.7 %
Income from operations (GAAP)	$ 102,729	$ 1,596
Stock-based compensation	19,441	11,432
Restructuring and asset impairment charges	2,599	4,128
Reserve for non-recurring legal matter	—	1,765
Acquisition related expenses and amortization	2,183	1,614
Income from operations (Non-GAAP)	$ 126,952	$ 20,535
Net income (loss) (GAAP)	$ 161,148	$ (11,627)
Stock-based compensation	19,441	11,432
Restructuring and asset impairment charges	2,599	4,128
Reserve for non-recurring legal matter	—	1,765
Acquisition related expenses and amortization	2,183	1,614
Non-recurring debt prepayment fees and non-cash interest	13,205	2,701
Non-GAAP income tax adjustment	(74,371)	—
Net income (Non-GAAP)	$ 124,205	$ 10,013
Net income (loss) per share, basic (GAAP)	$ 1.38	$ (0.12)
Stock-based compensation	0.17	0.11
Restructuring and asset impairment charges	0.02	0.04
Reserve for non-recurring legal matter	—	0.02
Acquisition related expenses and amortization	0.02	0.02
Non-recurring debt prepayment fees and non-cash interest	0.11	0.03
Non-GAAP income tax adjustment	(0.64)	—
Net income per share, basic (Non-GAAP)	$ 1.06	$ 0.10
Shares used in basic per share calculation GAAP and Non-GAAP	116,713	99,619
Net income (loss) per share, diluted (GAAP)	$ 1.23	$ (0.12)
Stock-based compensation	0.15	0.11
Restructuring and asset impairment charges	0.02	0.04
Reserve for non-recurring legal matter	—	0.02
Acquisition related expenses and amortization	0.02	0.02
Non-recurring debt prepayment fees and non-cash interest	0.10	0.03
Non-GAAP income tax adjustment	(0.57)	—
Net income per share, diluted (Non-GAAP) [1]	$ 0.95	$ 0.10
Shares used in diluted per share calculation GAAP	131,644	99,619
Shares used in diluted per share calculation Non-GAAP [2]	131,193	111,696

[1] Calculation of non-GAAP diluted net income per share for the twelve months ended December 31, 2019 and December 31, 2018 excludes convertible notes due 2023 interest expense, net of tax of $0.9 million and $0.7 million, respectively, from non-GAAP net income.

[2] Effect of dilutive in-the-money portion of convertible senior notes and warrants are included in the GAAP weighted-average diluted shares in periods where we have GAAP net income. We excluded the in-the-money portion of convertible notes due 2024 totaling 1288 thousand shares for the twelve months ended December 31, 2019, for non-GAAP weighted-average diluted shares as the Company entered into convertible note hedge transactions that reduce potential dilution to the Company's common stock upon any conversion of the Notes due 2024.

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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, 2019

or

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

For the transition period from to

Commission File Number: 001-35480

ENPHASE®

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

Delaware	**20-4645388**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

47281 Bayside Parkway
Fremont, CA 94538
(Address of principal executive offices, including zip code)

(707) 774-7000
(Registrant's telephone number, including area code)

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

Title of each class:	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, $0.00001 par value per share	**ENPH**	**The Nasdaq Stock Market LLC**

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 Section 15(d) of the 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, a smaller reporting company, or an emerging growth company. See definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

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

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

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

The aggregate market value of the voting stock held by non-affiliates of the registrant on June 30, 2019, based upon the closing price of $18.23 of the registrant's common stock as reported on the Nasdaq Global Market, was approximately $1.6 billion.

As of February 14, 2020, there were 123,179,271 shares of the registrant's common stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Proxy Statement for the 2020 Annual Meeting of Stockholders to be filed with the Securities and Exchange Commission within 120 days after the end of the registrant's fiscal year ended December 31, 2019 are incorporated by reference into Part III of this Annual Report on Form 10-K.

Enphase Energy, Inc.

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This Annual Report on Form 10-K contains "forward-looking statements" as defined under securities laws. Forward-looking statements include statements that are not historical facts and can be identified by terms such as "anticipates," "believes," "could," "seeks," "estimates," "expects," "intends," "may," "plans," "potential," "predicts, "projects," "should," "will," "would" or similar expressions and the negatives of those terms. These forward-looking statements are contained principally in Item 1, Business; Item 1A, Risk Factors; Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations; and other sections of this Annual Report on Form 10-K. Our actual results or experience could differ significantly from the forward-looking statements. Factors that could cause or contribute to these differences include those discussed in Item 1A, Risk Factors, as well as those discussed elsewhere in this Annual Report on Form 10-K.

Forward-looking statements are inherently uncertain, and you should not place undue reliance on these statements, which speak only as of the date that they were made. These cautionary statements should be considered in connection with any written or oral forward-looking statements that we may issue in the future. We do not undertake any obligation to release publicly any revisions to these forward-looking statements after completion of the filing of this Annual Report on Form 10-K to reflect later events or circumstances or to reflect the occurrence of unanticipated events.

In this report, unless otherwise indicated or the context otherwise requires, "Enphase Energy," "Enphase," "the Company," "we," "us," and "our" refer to Enphase Energy, Inc., a Delaware corporation, and its subsidiaries.

PART I

Item 1. Business

Our Company

We are a global energy technology company. We deliver smart, easy-to-use solutions that manage solar generation, storage and communication on one intelligent platform. We revolutionized the solar industry with our microinverter technology and we produce a fully integrated solar-plus-storage solution. We have shipped more than 25 million microinverters, and over one million Enphase residential and commercial systems have been deployed in more than 130 countries.

We were incorporated as PVI Solutions, Inc. in March 2006 in the State of Delaware and changed our name to Enphase Energy, Inc. in July 2007.

Industry Background

Historically, traditional central inverters were the only inverter technology used for solar PV installations. In an installation consisting of a traditional central inverter, the solar PV modules are connected in series strings. In a large installation, there are multiple series strings connected in parallel. The aggregated voltage from each of these strings is then fed into a large central inverter. We believe that traditional central inverters have a number of design and performance challenges limiting innovation and their ability to reduce the cost of solar power systems, including the following:

- *Productivity limits*. If solar modules are wired using a traditional central inverter—group or "string" of modules are wired in series, and an entire string's output is limited by the output of the lowest-performing module. Because of its string design, there is a single point of failure risk with the traditional central inverter approach.
- *Reliability issues*. Traditional central inverters are the single most common component of solar installations to fail, resulting in system downtime and adversely impacting total energy output. As a result, central inverters typically carry warranties of only 5 to 10 years.
- *Complex design and installation requirements*. The central inverter-based solar PV installation requires greater effort on the part of the installer, both in terms of design and on-site labor. Central inverter installations require string design and calculations for safe and reliable operation, as well as specialized equipment such as DC combiners, conduits and disconnects. In addition, the use of high-voltage direct current ("DC") requires specialized knowledge and training and safety precautions to install central inverter technology.

- *Lack of monitoring*. The majority of solar installations with central inverter technology offer limited monitoring capabilities. If a module in a central inverter system fails or is not performing to specification, the resulting loss of energy can go unnoticed for an extended period of time.
- *Safety issues*. Central inverter solar PV installations have a wide distribution of high-voltage (600 volts to 1,000 volts) DC wiring. If damaged, DC wires can generate sustained electrical arcs, reaching temperatures of more than 5,000 °F. This creates the risk of fire for solar PV installation owners and injury for installers and maintenance personnel.

These challenges of traditional central inverters have a direct impact on the cost and expected return on investment of solar installations to both installers and system owners:

- *Installer*. Solar PV installers aim for simple installation design, fast installation times and maximum system performance and predictability. The installation of high-voltage DC central inverter technology, however, requires significant preparation, precautionary safety measures, time-consuming string calculations, extensive design expertise and specialized installation equipment, training and knowledge. Together, these factors significantly increase complexity and cost of installation and limit overall productivity for the installer.
- *System owner*. Solar power system owners aim for high energy production, low cost, high reliability, and low maintenance requirements, as well as reduced fire risks. With traditional central inverters, owners often are unable to optimize the size or shape of their solar PV installations due to string design limitations. As such, they experience performance loss from shading and other obstructions, can face frequent system failures and lack the ability to effectively monitor the performance of their solar PV installation. In addition, central inverter installations operate at high-voltage DC which bears significant fire risks. Further, due to their large size, central inverter installations can affect architectural aesthetics of the house or commercial building.

The solar industry has started its transition from solar only systems to complete energy management solutions, which consist of solar plus storage and load control.

Our Products

We design, develop, manufacture and sell home energy solutions that manage energy generation, energy storage and control and communications on one intelligent platform. We have revolutionized the solar industry by bringing a systems approach to solar technology and by pioneering a semiconductor-based microinverter that converts energy at the individual solar module level and, combined with our proprietary networking and software technologies, provides advanced energy monitoring and control. This is vastly different than a central inverter system using string modules, with or without an optimizer, approach that only converts energy of the entire array of solar modules from a single high voltage electrical unit and lacks intelligence about the energy producing capacity of the solar array. The Enphase Home Energy Solution with IQ™ platform, which is our current generation integrated solar, storage and energy management offering, enables self-consumption and delivers our core value proposition of yielding more energy, simplifying design and installation, and improving system uptime and reliability. The IQ family of microinverters, like all of our previous microinverters, is fully compliant with NEC 2014 and 2017 rapid shutdown requirements. Unlike string inverters, this capability is built-in, with no additional equipment necessary.

The Enphase Home Energy Solution with IQ™ brings a high technology, networked approach to solar generation plus energy storage, by leveraging our design expertise across power electronics, semiconductors and cloud-based software technologies. Our integrated approach to energy solutions maximizes a home's energy potential while providing advanced monitoring and remote maintenance capabilities. The Enphase Home Energy Solution with IQ uses a single technology platform for seamless management of the whole solution, enabling rapid commissioning with the Installer Toolkit™; consumption monitoring with our Envoy™ Communications Gateway with IQ Combiner+, Enphase Enlighten, a cloud-based energy management platform, and our Enphase AC Battery™. System owners can use Enphase Enlighten to monitor their home's solar generation, energy storage and consumption from any web-enabled device. Unlike some of our competitors, who utilize a traditional inverter, or offer separate components of solutions, we have built-in system redundancy in both PV generation and energy storage, eliminating the risk that comes with a single-point of failure. Further, the nature of our cloud-based, monitored system allows for remote firmware and software updates, enabling cost-effective remote maintenance and ongoing utility compliance.

The Enphase IQ 7 Micro™ and Enphase IQ 7+ Micro™, part of our seventh-generation IQ product family, support high-powered 60-cell and 72-cell solar modules and integrate with alternating current ("AC") modules. Our IQ 7X™ product addresses 96-cell photovoltaic ("PV") modules up to 400W direct current ("DC") and with its 97.5 percent California Energy Commission ("CEC") efficiency rating, is ideal for integration into high power modules.

In the third quarter of 2019, we shipped significant volumes of IQ 7AS™ microinverters to SunPower Corporation, which integrated our IQ 7AS into its 66-cell Next Generation Technology ("NGT") DC modules. In November 2019, we began shipping to customers in North America our IQ™ 7A microinverters for solar modules up to 450 W, targeting high-power residential and commercial applications. Our customers should be able to pair the IQ 7A microinverter with monofacial or bifacial solar modules, up to 450 W, from solar module manufacturers who are expected to introduce high-power variants of their products in the next three years.

AC Module products are integrated systems which allow installers to be more competitive through improved logistics, reduced installation times, faster inspection and training. We began shipping Enphase Energized™ AC Modules in North America in 2017, and continued to make steady progress during 2019 with our AC module partners, including SunPower, Panasonic Corporation of North America and Solaria Corporation.

During the third quarter of 2019, we introduced the Enphase IQ Combiner 3C™, an important component of the Enphase Home Energy Solution with IQ platform, designed to provide an uninterrupted connectivity to the Enphase Enlighten™ monitoring and service platform.

Our next-generation IQ 8™ system is based upon our Always On Enphase Ensemble™ energy management technology. This system has five components: 1) energy generation, which is accomplished with the grid-agnostic microinverter IQ 8; 2) energy storage, which is achieved by the Encharge™ battery with capacities of 3.4 kWh and 10.1 kWh; 3) microgrid interconnect device (MID); 4) communication and control via the combiner box with the Envoy gateway; and 5) Enlighten, which is the internet of things, or IoT, cloud software.

We started accepting pre-orders of Ensemble technology products, which is focused on enabling high capacity storage for North America, through our distribution partners in November 2019. Storage is enabled by our Encharge battery, which is a modular 3.4 kWh solution. The modularity allows for ease of installation, flexibility and scalability, while helping to streamline our supply chain. The Encharge battery will be available in two variants - 3.4kWh and 10.1 kWh configuration. The 3.4 kWh battery contains four IQ 8 grid-agnostic microinverters internally.

After the release of the storage product, expected in the first quarter of 2020, we anticipate further revisions of Ensemble to be released in 2020, with a focus on IQ 8 PV or IQ 8 solar installations. The advantage of IQ 8s on the roof will be that these grid-forming microinverters produce power from panels even during blackouts, as long as the sun is still shining. It addresses a major drawback of traditional solar installations without the need for storage and is differentiated in that respect.

The pure off-grid solution that Ensemble technology also addresses started shipping to our partners on IQ 8 during the fourth quarter of 2019.

In December 2019, we announced two future products: the Enphase IQ 8D™ for commercial solar purposes an off-grid solar and storage system that are designed to support multiple applications for the Indian market.

Our Strategy

Our objective is to be the leading provider of energy management solutions worldwide. Key elements of our strategy include:

- *Grow market share in our core markets.* We intend to capitalize on our market leadership in the microinverter category and our momentum with installers and owners to expand our market share position in our core markets.
- *Enter new geographic markets.* We intend to further increase our market share in Europe, Asia Pacific and Latin America regions. In addition, we intend to expand into new markets with new and existing products and local go-to-market capabilities.
- *Expand our product offerings.* We continue to invest in research and development to develop all components of our energy management solution and remain committed to providing our customers and partners with best-in-class power electronics, storage solutions, communications, and load control all managed by a cloud-based energy management system.
- *Increase power and efficiency and reduce cost per watt.* Our engineering team is focused on continuing to increase average power conversion efficiency above 97% and AC output power beyond 350 watts in order to pair with DC modules rated over 400 watts. We intend to continue to leverage our semiconductor integration, power electronics expertise and manufacturing economies of scale to further reduce cost per watt.

- *Extend our technological innovation.* We distinguish ourselves from other inverter companies with our systems-based and high technology approach, and the ability to leverage strong research and development capabilities.

Customers and Sales

We currently offer solutions targeting the residential and commercial markets in the U.S., Canada, Mexico, Central American markets, Europe, Australia, New Zealand, India and certain other Asian markets. We sell our solutions primarily to solar distributors who resell to installers and integrators, who in turn integrate our products into complete solar PV installations for residential and commercial system owners. We work with many of the leading solar and electrical distributors. In addition to our distributors, we sell directly to large installers, original equipment manufacturers ("OEM"), strategic partners and homeowners. Our OEM customers include solar module manufacturers who bundle our products and solutions with their solar module products and resell to both distributors and installers. We also sell certain products and services directly to the homeowners and the do-it-yourself market through our legacy product upgrade program or our online store. Strategic partners include a variety of companies including industrial equipment suppliers and providers of solar financing solutions. In 2019, two customers accounted for approximately 21% and 12% of total net revenues. Over the last three years, revenues generated from the U.S. market have represented 69% to 84% of our total revenue.

Manufacturing, Quality Control and Key Suppliers

We outsource the manufacturing of our products to manufacturing partners. Flex Ltd. and affiliates ("Flex") assemble and test our microinverter, AC Battery and Envoy products. Prices for such services are agreed to by the parties on a quarterly basis, and we are obligated to purchase manufactured products and raw materials that cannot be resold upon the termination of the agreement. Flex also provides receiving, kitting, storage, transportation, inventory visibility and other value-added logistics services at locations managed by Flex. Hong Kong Sinbon Industrial Limited manufactures our custom AC cables. In addition, we rely on several unaffiliated companies to supply certain components used in the fabrication of our products.

Our partnership with Flex provides us with strategic manufacturing capabilities and flexibility. In the beginning of the second quarter of 2019, we announced the first shipment of seventh-generation Enphase IQ™ microinverters produced in Mexico as part of our expanded manufacturing agreement with Flex. We anticipate that this additional manufacturing capacity in Mexico could help us to not only mitigate tariffs, but also better serve our customers by cutting down delivery times and diversifying our supply chain.

Customer Service

We continue to cultivate an organizational focus on customer satisfaction and are committed to providing a best-in-class customer experience. We maintain high levels of customer engagement through our customer support group and the Enlighten cloud-based software portal. During 2019, we introduced chat as a support channel in North America to help installers and homeowners solve their problems quickly. We launched Service-on-the-Go™ in Australia, which installers can use from their mobile devices to get service instantly. Our Net Promoter Score (commonly referred to as "NPS") improved from 37% in 2018 to 52% in 2019 through multiple customer service initiatives. In 2019, the service organization achieved average wait time of under 2 minutes.

Research and Development

We devote substantial resources to research and development with the objective of developing new products and systems, adding new features to existing products and systems and reducing unit costs. Our development strategy is to identify features, products and systems for both software and hardware that reduce the cost and optimize the effectiveness of our energy management solutions for our customers. We measure the effectiveness of our research and development against metrics, including product unit cost, efficiency, reliability, power output and ease-of-use.

Intellectual Property

We operate in an industry in which innovation, investment in new ideas and protection of our intellectual property, or IP, rights are critical for success. We protect our technology through a variety of means, including through patent, trademark, copyright and trade secrets laws in the U.S. and similar laws in other countries, confidentiality agreements and other contractual arrangements. As of December 31, 2019, we had 233 issued U.S. patents, 77 issued foreign patents, 43 pending U.S. patent applications and 28 pending foreign counterpart patent applications. Our issued patents are scheduled to expire between years 2020 and 2038.

We license certain power line communications technology and software for integration into our custom application specific integrated circuits ("ASIC"s), under a fully-paid, royalty-free license, which includes the right for us to source directly from the licensor's suppliers or manufacture certain ASIC hardware should the licensor fail, under certain conditions, to deliver such technology in the future. This license includes a limited exclusivity period during which the licensor has agreed not to license the licensed technology to any third-party manufacturer of electronic components or systems for use in the solar energy market. The license carries a 75-year term, subject to earlier termination upon agreement of the parties, or by us in connection with the insolvency of the licensor.

We also license digital intellectual property cores, or IP blocks, for integration into and distribution with certain electronic components built into our products, including our ASICs, complex programmable logic devices, or CPLDs, and field-programmable gate arrays, or FPGAs. This is a fully-paid, non-exclusive, non-transferable, royalty-free license providing for the integration of such digital IP blocks in an unlimited number of electronic component designs and the distribution of such electronic components with our products. Other than in connection with the distribution of our products, our use of such digital IP blocks is limited to certain of our business sites. The license is perpetual, subject to earlier termination by either party upon the termination, suspension or insolvency of the other party's business, or by the licensor upon a breach of the license agreement by us. In addition, we license open source software from third parties for integration into our Envoy products. Such open source software is licensed under open source licenses. These licenses are perpetual and require us to attribute the source of the software to the original software developer, which we provide via our website.

We continually assess the need for patent protection for those aspects of our technology, designs and methodologies and processes that we believe provide significant competitive advantages. A majority of our patents relate to DC to AC power conversion and energy storage for alternative energy power systems, as well as power system monitoring, control and management systems.

With respect to proprietary know-how that is not patentable and processes for which patents are difficult to enforce, we rely on trade secret protection and confidentiality agreements to safeguard our interests. We believe that many elements of our microinverter manufacturing process involve proprietary know-how, technology or data that are not covered by patents or patent applications, including technical processes, test equipment designs, algorithms and procedures.

We own or have rights to various registered trademarks and service marks in the U.S. and in other countries, including Enphase, Ensemble Envoy, and Enlighten, and rely on both registration of our marks as well as common law protection where available.

All of our research and development personnel have entered into confidentiality and proprietary information agreements with us. These agreements address intellectual property protection issues and require our employees to assign to us all of the inventions, designs and technologies they develop during the course of employment with us.

We also require our customers and business partners to enter into confidentiality agreements before we disclose any sensitive aspects of our technology or business plans.

As part of our overall strategy to protect our intellectual property, we may take legal actions to prevent third parties from infringing upon or misappropriating our intellectual property or from otherwise gaining access to our technology.

Seasonality

Historically, the majority of our revenues are from the North American and European regions which experience higher sales of our products in the second, third and fourth quarters and have been affected by seasonal customer demand trends, including weather patterns and construction cycles. The first quarter historically has had softer customer demand in our industry, due to these same factors. Although these seasonal factors are common in the solar sector, historical patterns should not be considered a reliable indicator of our future sales activity or performance.

Competition

The markets for our products are highly competitive, and we compete with traditional inverter manufacturers and new technology start-ups. The principal areas in which we compete with other companies include:

- Product performance and features;
- Total cost of ownership;
- Breadth of product line;
- Local sales and distribution capabilities;
- Module compatibility and interoperability;
- Reliability and duration of product warranty;
- Technological expertise;
- Brand recognition;
- Customer service and support;
- Compliance with industry standards and certifications;
- Compliance with current and planned local electrical codes;
- Integration with storage offerings;
- Size and financial stability of operations;
- Size of installed base; and
- Local manufacturing and product content.

Competitors in the inverter market include, among others, SolarEdge Technologies, Inc., SMA Solar Technology AG, Huawei Technologies Co. Ltd., Fronius International GmbH, AP Systems, Generac, Yaskawa Solectria Solar, and other companies offering alternative microinverter, DC-to-DC optimizer and other power electronic solutions. We principally compete with the large, incumbent solar inverter companies, because traditional central inverter solutions can be used as alternatives to our microinverter solution. We believe, however, that our microinverter solutions offer significant advantages and competitive differentiation relative to traditional central or string inverter technology, even when supplemented by DC-to-DC optimizers. Competitors in the storage market include SolarEdge Technologies, Sonnen, Tesla, LG Chem, SMA Solar Technology AG, Panasonic, Delta Electronics, Generac, and producers of battery cells and other integrated storage systems.

Employees

As of December 31, 2019, we had 577 full-time employees. Of the full-time employees, 245 were engaged in research and development, 220 in sales and marketing, 64 in general and administration and 48 in manufacturing and operations. Of these employees, 260 were in the United States, 192 in India, 74 in New Zealand, 21 in Europe, 15 in Australia, 14 in China and 1 in Canada.

None of our employees are represented by a labor union; however, our employees in France are represented by a collective bargaining agreement. We have not experienced any employment-related work stoppages, and we consider our relations with our employees to be good.

Available Information

We file electronically with the U.S. Securities and Exchange Commission, or SEC, our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and amendments to those reports filed pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, or the Exchange Act can be accessed on our Investor Relations website at www.investor.enphase.com. We make available, free of charge, copies of these reports as soon as reasonably practicable after filing these reports with the SEC or otherwise furnishing it to the SEC. The contents of our websites are not incorporated by reference into this Annual Report on Form 10-K or in any other report or document we file with the SEC, and any references to our websites are intended to be inactive textual references only.

Item 1A. Risk Factors

We have identified the following risks and uncertainties that may have a material adverse effect on our business, financial condition or results of operations. The risks described below are not the only ones we face. Additional risks not presently known to us or that we currently believe are not material may also significantly impair our business operations. Our business could be harmed by any of these risks. The trading price of our common stock could decline due to any of these risks, and you may lose all or part of your investment. In assessing these risks, you should also refer to the other information contained in this Annual Report on Form 10-K, including our consolidated financial statements and related notes.

The rapidly changing solar industry makes it difficult to evaluate our current business and future prospects.

The rapidly changing solar industry makes it difficult to evaluate our current business and future prospects. We have encountered and will continue to encounter risks and difficulties frequently experienced by growing companies in rapidly changing industries, including increased expenses as we continue to grow our business. If we do not manage these risks and overcome these difficulties successfully, our business will suffer.

Since we began commercial shipments of our products, our revenue, gross profit and results of operations have varied and are likely to continue to vary from quarter to quarter due to a number of factors, many of which are not within our control. It is difficult for us to accurately forecast our future revenue and gross profit and plan expenses accordingly and, therefore, it is difficult for us to predict our future results of operations.

If demand for solar energy solutions does not grow or grows at a slower rate than we anticipate, our business will suffer.

Our microinverter and AC Battery storage systems are utilized in solar PV installations, which provide on-site distributed power generation. As a result, our future success depends on continued demand for solar energy solutions and the ability of solar equipment vendors to meet this demand. The solar industry is an evolving industry that has experienced substantial changes in recent years, and we cannot be certain that consumers and businesses will adopt solar PV systems as an alternative energy source at levels sufficient to continue to grow our business. Traditional electricity distribution is based on the regulated industry model under which businesses and consumers obtain their electricity from a government regulated utility. For alternative methods of distributed power to succeed, businesses and consumers must adopt new purchasing practices. The viability and continued growth in demand for solar energy solutions, and in turn, our products, may be impacted by many factors outside of our control, including:

- market acceptance of solar PV systems based on our product platform;
- cost competitiveness, reliability and performance of solar PV systems compared to conventional and non-solar renewable energy sources and products;
- availability and amount of government subsidies and incentives to support the development and deployment of solar energy solutions;
- the extent to which the electric power industry and broader energy industries are deregulated to permit broader adoption of solar electricity generation;
- the cost and availability of key raw materials and components used in the production of solar PV systems;
- prices of traditional utility-provided energy sources;
- levels of investment by end-users of solar energy products, which tend to decrease when economic growth slows; and

- the emergence, continuance or success of, or increased government support for, other alternative energy generation technologies and products.

If demand for solar energy solutions does not grow, demand for our customers' products as well as demand for our products will decrease, which would have an adverse impact on our ability to increase our revenue and grow our business.

Short-term demand and supply imbalances, especially for solar module technology, have recently caused prices for solar technology solutions to decline rapidly. Furthermore, competition in the solar industry has increased due to the emergence of lower-cost manufacturers along the entire solar value chain causing further price declines, excess inventory and oversupply. These market disruptions may continue to occur and may increase pressure to reduce prices, which could adversely affect our business and financial results.

The loss of, or events affecting, one of our major customers could reduce our sales and have a material adverse effect on our business, financial condition and results of operations.

In 2019, two customers accounted for approximately 21% and 12% of total net revenues. Our customers' decisions to purchase our products are influenced by a number of factors outside of our control, including retail energy prices and government regulation and incentives, among others. Although we have agreements with some of our largest customers, these agreements generally do not have long-term purchase commitments and are generally terminable by either party after a relatively short notice period. In addition, these customers may decide to no longer use, or to reduce the use of, our products and services for other reasons that may be out of our control. We may also be affected by events impacting our large customers that result in their decreasing their orders with us or impairing their ability to pay for our products. The loss of, or events affecting, one or more of our large customers have had from time to time, and could in the future have a material adverse effect on our business, financial condition and results of operations.

We depend upon a small number of outside contract manufacturers, and our operations could be disrupted if we encounter problems with these contract manufacturers.

We do not have internal manufacturing capabilities and rely upon a small number of contract manufacturers to build our products. Our reliance on a small number of contract manufacturers makes us vulnerable to possible capacity constraints and reduced control over component availability, delivery schedules, manufacturing yields and costs. We do not have long-term supply contracts with our contract manufacturing partners. Consequently, these manufacturers are not obligated to supply products to us for any period, in any specified quantity or at any certain price.

The revenues that our contract manufacturers generate from our orders may represent a relatively small percentage of their overall revenues. As a result, fulfilling our orders may not be considered a priority in the event of constrained ability to fulfill all of their customer obligations in a timely manner. In addition, the facilities in which the vast majority of our products are manufactured are located outside of the U.S. We believe that the location of these facilities outside of the U.S. increases supply risk, including the risk of supply interruptions or reductions in manufacturing quality or controls.

If any of our contract manufacturers were unable or unwilling to manufacture our products in required volumes and at high quality levels or renew existing terms under supply agreements, we would have to identify, qualify and select acceptable alternative contract manufacturers. An alternative contract manufacturer may not be available to us when needed or may not be in a position to satisfy our quality or production requirements on commercially reasonable terms. Any significant interruption in manufacturing would require us to reduce our supply of products to our customers, which in turn would reduce our revenues, harm our relationships with our customers and cause us to forgo potential revenue opportunities.

Manufacturing problems could result in delays in product shipments to customers and could adversely affect our revenue, competitive position and reputation.

We may experience delays, disruptions or quality control problems in our manufacturing operations. Our product development, manufacturing and testing processes are complex and require significant technological and production process expertise. Such processes involve a number of precise steps from design to production. Any change in our processes could cause one or more production errors, requiring a temporary suspension or delay in our production line until the errors can be researched, identified and properly addressed and rectified. This may occur particularly as we introduce new products, modify our engineering and production techniques, and expand our capacity. In addition, our failure to maintain appropriate quality assurance processes could result in increased product failures, loss of customers, increased production costs and delays. Any of these developments could have a material adverse effect on our business, financial condition, and results of operations.

A disruption could also occur in one of our contract manufacturers' facilities due to any number of reasons, such as equipment failure, contaminated materials or process deviations, which could adversely impact manufacturing yields or delay product shipments. As a result, we could incur additional costs that would adversely affect our gross profit, and product shipments to our customers could be delayed beyond the schedules requested, which would negatively affect our revenue, competitive position and reputation.

Additionally, manufacturing yields depend on a number of factors, including the stability and manufacturability of the product design, manufacturing improvements gained over cumulative production volumes, and the quality and consistency of component parts. Capacity constraints, raw materials shortages, logistics issues, labor shortages, and changes in customer requirements, manufacturing facilities or processes have historically caused, and may in the future cause, reduced manufacturing yields, negatively impacting the gross profit on, and our production capacity for, those products. Moreover, an increase in the rejection and rework rate of products during the quality control process before, during or after manufacture would result in our experiencing lower yields, gross profit and production capacity.

Component shortages have required us and may continue to require us to incur expedited shipping costs to meet delivery schedules, which impacts our revenue and gross profit.

The risks of these types of manufacturing problems are further increased during the introduction of new product lines, which has from time to time caused, and may in the future cause, temporary suspension of product lines while problems are addressed or corrected. Since our business is substantially dependent on a limited number of product lines, any prolonged or substantial suspension could result in a material adverse effect on our revenue, gross profit, competitive position, and distributor and customer relationships.

We depend on sole-source and limited-source suppliers for key components and products. If we are unable to source these components on a timely basis, we will not be able to deliver our products to our customers.

We depend on sole-source and limited-source suppliers for key components of our products. For example, our ASICs are purchased from a sole source supplier or developed for us by sole source suppliers. Any of the sole-source and limited-source suppliers upon whom we rely could experience quality and reliability issues, stop producing our components, cease operations, or be acquired by, or enter into exclusive arrangements with, our competitors. We generally do not have long-term supply agreements with our suppliers, and our purchase volumes may currently be too low for us to be considered a priority customer by most of our suppliers. As a result, most of these suppliers could stop selling to us at commercially reasonable prices, or at all. Any such quality or reliability issue, or interruption or delay may force us to seek similar components or products from alternative sources, which may not be available on commercially reasonable terms, or at all. Switching suppliers may require that we redesign our products to accommodate new components, and may potentially require us to re-qualify our products, which would be costly and time-consuming. Any interruption in the quality or supply of sole-source or limited-source components for our products would adversely affect our ability to meet scheduled product deliveries to our customers and could result in lost revenue or higher expenses and would harm our business.

U.S. government actions with regard to the solar energy sector or international trade could materially harm our business, financial condition and results of operations.

The current U.S. presidential administration has created and may continue to create regulatory uncertainty in the clean energy sector generally and the solar energy sector in particular. If the administration or the U.S. Congress takes action to eliminate or reduce laws, regulations and incentives supporting solar energy, such actions may result in a decrease in demand for solar energy in the U.S. and other geographical markets, which could materially harm our business, financial condition and results of operations.

On September 24, 2018 the U.S. began assessing 10% tariffs on certain solar products manufactured in China including our microinverter products and related accessories which are manufactured in China. These tariffs increased to 25% in May 2019. Such tariffs could have a negative impact on the overall demand for solar products in the U.S., and for our products in particular. Unless we obtain exemptions or take other actions to avoid them, such tariffs will continue to apply to our microinverters and other products. Such tariffs could hurt the demand for these products and materially harm our business, financial condition and results of operations. There is no guarantee that we will be successful in obtaining exemptions or that any actions that we may pursue with respect to the organization and operation of our business will effectively mitigate the effects of any tariffs that apply to our business. If we are not able to avoid or mitigate the effects of such tariffs, the tariffs (or mitigating actions we might take) could result in material additional costs to us and our suppliers, and our results of operations could be negatively impacted as a result.

Furthermore, a significant portion of our business activities are conducted in foreign countries, including Mexico, Canada and elsewhere. The U.S., Mexico and Canada are in the process of replacing the North American Free Trade Agreement ("NAFTA") with the United States-Mexico-Canada Agreement ("USMCA"). At this time, the final version of the USMCA remains unclear. If the USMCA, or any other trade action taken by the administration, imposes any additional border tariff or takes any other actions making it more difficult for us to sell our products across international boundaries, our business, financial condition and results of operations could be adversely affected.

If we or our contract manufacturers are unable to obtain raw materials in a timely manner or if the price of raw materials increases significantly, production time and product costs could increase, which may adversely affect our business.

The manufacturing and packaging processes used by our contract manufacturers depend on raw materials such as copper, aluminum, silicon and petroleum-based products. From time to time, suppliers may extend lead times, limit supplies or increase prices due to capacity constraints or other factors. Certain of our suppliers have the ability to pass along to us directly or through our contract manufacturers any increases in the price of raw materials. If the prices of these raw materials rise significantly, we may be unable to pass on the increased cost to our customers. While we may from time to time enter into hedging transactions to reduce our exposure to wide fluctuations in the cost of raw materials, the availability and effectiveness of these hedging transactions may be limited. Due to all these factors, our results of operations could be adversely affected if we or our contract manufacturers are unable to obtain adequate supplies of raw materials in a timely manner or at reasonable cost. In addition, from time to time, we or our contract manufacturers may need to reject raw materials that do not meet our specifications, resulting in potential delays or declines in output. Furthermore, problems with our raw materials may give rise to compatibility or performance issues in our products, which could lead to an increase in customer returns or product warranty claims. Errors or defects may arise from raw materials supplied by third parties that are beyond our detection or control, which could lead to additional customer returns or product warranty claims that may adversely affect our business and results of operations.

If we fail to retain our key personnel or if we fail to attract additional qualified personnel, we may not be able to achieve our anticipated level of growth and our business could suffer.

Our future success and ability to implement our business strategy depends, in part, on our ability to attract and retain key personnel, and on the continued contributions of members of our senior management team and key personnel in areas such as engineering, marketing, and sales, any of whom would be difficult to replace. All of our employees, including our senior management, are free to terminate their employment relationships with us at any time. Competition for highly skilled executives and employees in the technology industry is intense and our competitors have targeted individuals in our organization that have desired skills and experience. If we are not able to continue to attract, train and retain our leadership team and our qualified employees necessary for our business, the progress of our product development programs could be hindered, and we could be materially adversely affected. To help attract, retain and motivate our executives and qualified employees, we use share-based incentive awards such as employee stock purchase plan and non-vested share units (restricted stock units). If the value of such stock awards does not appreciate as measured by the performance of the price of our common stock, or if our share-based compensation otherwise ceases to be viewed as a valuable benefit, our ability to attract, retain and motivate our executives and employees could be weakened, which could harm our results of operations. Also, if the value of our stock awards increases substantially, this could potentially create substantial personal wealth for our executives and employees and affect our ability to retain our personnel. In addition, any future restructuring plans may adversely impact our ability to attract and retain key employees.

The solar industry is highly competitive, and we expect to face increased competition as new and existing competitors introduce products, which could negatively impact our results of operations and market share.

The market for solar power solutions is highly competitive. We compete primarily against central and string inverter manufacturers, as well as against new solutions and emerging technologies that directly compete with our business. A number of companies have developed or are developing microinverters and other products that will compete directly with our solutions in the module-level power electronics market. Competitors in the inverter market include, among others, SolarEdge Technologies, Inc., SMA Solar Technology AG, Huawei Technologies Co. Ltd., Fronius International GmbH, ABB Ltd., AP Systems, Generac, Yaskawa Solectria. Other existing or emerging companies may also begin offering alternative microinverter, DC-to-DC optimizer, energy storage, monitoring and other solutions that compete with our products. Competitors in the storage market include SolarEdge Technologies, Sonnen, Tesla, LG Chem, SMA Solar Technology AG, Panasonic, Delta Electronics, Generac, and producers of battery cells and other integrated storage systems.

Several of our existing and potential competitors are significantly larger than we are and may have greater financial, marketing, distribution, and customer support resources, and may have significantly broader brand recognition, especially in certain markets. In addition, some of our competitors have more resources and experience in developing or acquiring new products and technologies and creating market awareness for these offerings. Further, certain competitors may be able to develop new products more quickly than we can and may be able to develop products that are more reliable or that provide more functionality than ours. In addition, some of our competitors have the financial resources to offer competitive products at aggressive or below-market pricing levels, which could cause us to lose sales or market share or require us to lower prices of our products in order to compete effectively. Suppliers of solar products, particularly solar modules, have experienced eroding prices over the last several years and as a result many have faced margin compression and declining revenues. If we have to reduce our prices, or if we are unable to offset any future reductions in our average selling prices by increasing our sales volume, reducing our costs and expenses or introducing new products, our revenues and gross profit would suffer.

We also may face competition from some of our customers or potential customers who evaluate our capabilities against the merits of manufacturing products internally. Other solar module manufacturers could also develop or acquire competing inverter technology or attempt to develop components that directly perform DC-to-AC conversion in the module itself. Due to the fact that such customers may not seek to make a profit directly from the manufacture of these products, they may have the ability to manufacture competitive products at a lower cost than we would charge such customers. As a result, these customers or potential customers may purchase fewer of our systems or sell products that compete with our systems, which would negatively impact our revenue and gross profit.

Developments in alternative technologies or improvements in distributed solar energy generation may have a material adverse effect on demand for our offerings.

Significant developments in alternative technologies, such as advances in other forms of distributed solar PV power generation, storage solutions such as batteries, the widespread use or adoption of fuel cells for residential or commercial properties or improvements in other forms of centralized power production may have a material adverse effect on our business and prospects. Any failure by us to adopt new or enhanced technologies or processes, or to react to changes in existing technologies, could result in product obsolescence, the loss of competitiveness of our products, decreased revenue and a loss of market share to competitors.

Our recent and planned expansion into existing and new markets could subject us to additional business, financial and competitive risks.

We currently offer solar microinverter systems targeting the residential and commercial markets throughout the world, and we intend to expand into other international markets. Our success in new geographic and product markets will depend on a number of factors, such as:

- acceptance of microinverters in markets in which they have not traditionally been used;
- our ability to compete in new product markets to which we are not accustomed;
- our ability to manage manufacturing capacity and production;
- willingness of our potential customers to incur a higher upfront capital investment than may be required for competing solutions;
- timely qualification and certification of new products;

- our ability to reduce production costs in order to price our products competitively;
- availability of government subsidies and economic incentives for solar energy solutions;
- accurate forecasting and effective management of inventory levels in line with anticipated product demand;
- our customer service capabilities and responsiveness; and
- timely hiring of the skilled employees and efficient execution of our project plan.

Further, new geographic markets and larger commercial and utility-scale installation markets have different characteristics from the markets in which we currently sell products, and our success will depend on our ability to properly address these differences. These differences may include:

- differing regulatory requirements, including tax laws, trade laws, labor, safety, local content, recycling and consumer protection regulations, tariffs, export quotas, customs duties or other trade restrictions;
- limited or unfavorable intellectual property protection;
- risk of change in international political or economic conditions;
- restrictions on the repatriation of earnings;
- fluctuations in the value of foreign currencies and interest rates;
- difficulties and increased expenses in complying with a variety of U.S. and foreign laws, regulations and trade standards, including the Foreign Corrupt Practices Act and UK Bribery Act;
- potentially longer sales cycles;
- generally longer payment cycles and greater difficulty in collecting accounts receivable;
- higher volume requirements;
- increased customer concentrations;
- warranty expectations and product return policies; and
- cost, performance and compatibility requirements.

Failure to address these new markets successfully, to generate sufficient revenue from these markets to offset associated research and development, marketing and manufacturing costs, or to otherwise effectively anticipate and manage the risks and challenges associated with our potential expansion into new product and geographic markets, could adversely affect our revenues and our ability to achieve or sustain profitability.

We may fail to capture customers in the new product and geographic markets that we are pursuing.

We are pursuing opportunities in energy management and energy storage which are highly competitive markets. We have made investments in our infrastructure, increased our operating costs and forgone other business opportunities in order to seek opportunities in these areas and will continue to do so. Any new product is subject to certain risks, including component sourcing, strategic partner selection and execution, customer acceptance, competition, product differentiation, market timing, challenges relating to economies of scale in component sourcing and the ability to attract and retain qualified personnel. There can be no assurance that we will be able to develop and grow these or any other new concepts to a point where they will become profitable or generate positive cash flow. If we fail to execute on our plan with respect to new product introductions, these new potential business segments fail to translate into revenue in the quantities or timeline projected, thus, having a materially adverse impact on our revenue, operating results and financial stability.

In the fourth quarter of 2019, we announced our eight-generation IQ microinverters and Ensemble technology. Our new product could be complex requiring requires significant preparation, precautionary safety measures, time-consuming string calculations, extensive design expertise and specialized installation equipment, training and knowledge. Together, these factors significantly increase complexity and cost of installation and limit overall productivity for the installer. Our installer may not have sufficient resources or expertise necessary to sell our products at the prices, in the volumes and within the time frames that we expect, which could hinder our ability to expand our operations and harm our revenue and operating results.

We rely primarily on distributors, installers and providers of solar financing to assist in selling our products, and the failure of these customers to perform as expected could reduce our future revenue.

We sell our solutions primarily through distributors, as well as through direct sales to solar equipment installers and sales to developers of third-party solar finance offerings. We do not have exclusive arrangements with these third parties and, as a result, many of our customers also use or market and sell products from our competitors, which may reduce our sales. Our customers may generally terminate their relationships with us at any time, or with short notice. Our customers may fail to devote resources necessary to sell our products at the prices, in the volumes and within the time frames that we expect, or may focus their marketing and sales efforts on products of our competitors. In addition, participants in the solar industry are becoming increasingly focused on vertical integration of the solar financing and installation process, which may lead to an overall reduction in the number of potential parties who may purchase and install our products.

In addition, while we provide our distributors and installers with training and programs, including accreditations and certifications, these programs may not be effective or utilized consistently. In addition, new partners may require extensive training and may take significant time and resources to achieve productivity. Our partners may subject us to lawsuits, potential liability, and reputational harm if, for example, any of our partners misrepresent the functionality of our platform or products to customers, fail to perform services to our customers' expectations, or violate laws or our corporate policies. In addition, our partners may utilize our platform to develop products and services that could potentially compete with products and services that we offer currently or in the future. Concerns over competitive matters or intellectual property ownership could constrain these partnerships. If we fail to effectively manage and grow our network of partners, or properly monitor the quality and efficacy of their service delivery, our ability to sell our products and efficiently provide our services may be impacted, and our operating results may be harmed.

Our future performance depends on our ability to effectively manage our relationships with our existing customers, as well as to attract additional customers that will be able to market and support our products effectively, especially in markets in which we have not previously distributed our products. Termination of agreements with current customers, failure by customers to perform as expected, or failure by us to cultivate new customer relationships, could hinder our ability to expand our operations and harm our revenue and operating results.

Our microinverter systems, including our storage solution, integrated AC Module, eighth-generation IQ microinverters and Ensemble technology, may not achieve broader market acceptance, which would prevent us from increasing our revenue and market share.

If we fail to achieve broader market acceptance of our products, including international acceptance of our eighth-generation IQ microinverters and Ensemble technology announced in the fourth quarter of 2019, there would be an adverse impact on our ability to increase our revenue, gain market share and achieve and sustain profitability. Our ability to achieve broader market acceptance for our products will be impacted by a number of factors, including:

- our ability to produce PV systems that compete favorably against other solutions on the basis of price, quality, reliability and performance;
- our ability to timely introduce and complete new designs and timely qualify and certify our products;
- whether installers, system owners and solar financing providers will continue to adopt our systems, which have a relatively limited history with respect to reliability and performance;
- whether installers, system owners and solar financing providers will adopt our storage solution, which is a relatively new technology with a limited history with respect to reliability and performance;
- the ability of prospective system owners to obtain long-term financing for solar PV installations based on our product platform on acceptable terms or at all;
- our ability to develop products that comply with local standards and regulatory requirements, as well as potential in-country manufacturing requirements; and
- our ability to develop and maintain successful relationships with our customers and suppliers.

In addition, our ability to achieve increased market share will depend on our ability to increase sales to established solar installers, who have traditionally sold central or string inverters, or who currently sell DC-to-DC optimizers. These installers often have made substantial investments in design, installation resources and training in traditional central or string inverter systems or DC optimizers, which may create challenges for us to achieve their adoption of our solutions.

The reduction, elimination or expiration of government subsidies and economic incentives for on-grid solar electricity applications could reduce demand for solar PV systems and harm our business.

The market for on-grid applications, where solar power is used to supplement a customer's electricity purchased from the utility network or sold to a utility under tariff, depends in large part on the availability and size of government and economic incentives that vary by geographic market. Because our customers' sales are typically into the on-grid market, the reduction, elimination or expiration of government subsidies and economic incentives for on-grid solar electricity may negatively affect the competitiveness of solar electricity relative to conventional and non-solar renewable sources of electricity and could harm or halt the growth of the solar electricity industry and our business.

In general, the cost of solar power currently exceeds retail electricity rates, and we believe this tendency will continue in the near term. As a result, national, state and local government bodies in many countries, including the U.S., have provided incentives in the form of feed-in tariffs, or FiTs, rebates, tax credits and other incentives to system owners, distributors, system integrators and manufacturers of solar PV systems to promote the use of solar electricity in on-grid applications and to reduce dependency on other forms of energy. Many of these government incentives expire, phase out over time, terminate upon the exhaustion of the allocated funding, require renewal by the applicable authority or are being changed by governments due to changing market circumstances or changes to national, state or local energy policy.

Electric utility companies or generators of electricity from other non-solar renewable sources of electricity may successfully lobby for changes in the relevant legislation in their markets that are harmful to the solar industry. Reductions in, or eliminations or expirations of, governmental incentives in regions where we focus our sales efforts could result in decreased demand for and lower revenue from solar PV systems there, which would adversely affect sales of our products. In addition, our ability to successfully penetrate new geographic markets may depend on new countries adopting and maintaining incentives to promote solar electricity, to the extent such incentives are not currently in place. Furthermore, electric utility companies may establish pricing structures or interconnection requirements that could adversely affect our sales and be harmful to the solar and distributed rooftop solar generation industry.

Our gross profit may fluctuate over time, which could impair our ability to achieve or maintain profitability.

Our gross profit has varied in the past and is likely to continue to vary significantly from period to period. Our gross profit may be adversely affected by numerous factors, some of which are beyond our control, including:

- changes in customer, geographic or product mix;
- increased price competition, including the impact of customer and competitor discounts and rebates;
- our ability to reduce and control product costs, including our ability to make product cost reductions in a timely manner to offset declines in our product prices;
- warranty costs and reserves, including changes resulting from changes in estimates related to the long-term performance of our products, product replacement costs and warranty claim rates;
- loss of cost savings due to changes in component or raw material pricing or charges incurred due to inventory holding periods if product demand is not correctly anticipated;
- introduction of new products;
- ordering patterns from our distributors;
- price reductions on older products to sell remaining inventory;
- component shortages and related expedited shipping costs;
- our ability to reduce production costs, such as through technology innovations, in order to offset price declines in our products over time;
- changes in shipment volume;
- changes in distribution channels;
- excess and obsolete inventory and inventory holding charges;
- expediting costs incurred to meet customer delivery requirements;
- tariffs assessed on our products imported to the U.S. and elsewhere; and

- fluctuations in foreign currency exchange rates.

Fluctuations in gross profit may adversely affect our ability to manage our business or achieve or maintain profitability.

We are under continuous pressure to reduce the prices of our products, which has adversely affected, and may continue to adversely affect, our gross margins.

The solar power industry has been characterized by declining product prices over time. We have reduced the prices of our products in the past, and we expect to continue to experience pricing pressure for our products in the future, including from our major customers. In addition, we have reduced our prices ahead of planned cost reductions of our products, which has adversely affected our gross margins. When seeking to maintain or increase their market share, our competitors may also reduce the prices of their products. In addition, our customers may have the ability or seek to internally develop and manufacture competing products at a lower cost than we would otherwise charge, which would add additional pressure on us to lower our selling prices. If we are unable to offset any future reductions in our average selling prices by increasing our sales volume, reducing our costs and expenses or introducing new products, our gross margins would continue to be adversely affected.

Given the general downward pressure on prices for our products driven by competitive pressure and technological change, a principal component of our business strategy is reducing the costs to manufacture our products to remain competitive. If our competitors are able to drive down their manufacturing costs faster than we can or increase the efficiency of their products, our products may become less competitive even when adjusted for efficiency, and we may be forced to sell our products at a price lower than our cost. Further, if raw materials costs and other third-party component costs were to increase, we may not meet our cost reduction targets. If we cannot effectively execute our cost reduction roadmap, we may not be able to remain price competitive, which would result in lost market share and lower gross margins.

A drop in the retail price of electricity derived from the utility grid or from alternative energy sources, or a change in utility pricing structures, may harm our business, financial condition and results of operations.

We believe that a system owner's decision to purchase a solar PV system is strongly influenced by the cost of electricity generated by solar PV installations relative to the retail price of electricity from the utility grid and the cost of other renewable energy sources, including electricity from solar PV installations using central inverters. Decreases in the retail prices of electricity from the utility grid would make it more difficult for all solar PV systems to compete. In particular, growth in unconventional natural gas production and an increase in global liquefied natural gas capacity are expected to keep natural gas prices relatively low for the foreseeable future. Persistent low natural gas prices, lower prices of electricity produced from other energy sources, such as nuclear power or coal-fired plants, or improvements to the utility infrastructure could reduce the retail price of electricity from the utility grid, making the purchase of solar PV systems less economically attractive and depressing sales of our products. In addition, energy conservation technologies and public initiatives to reduce demand for electricity also could cause a fall in the retail price of electricity from the utility grid. Moreover, technological developments by our competitors in the solar industry, including manufacturers of central inverters and DC-to-DC optimizers, could allow these competitors or their partners to offer electricity at costs lower than those that can be achieved from solar PV installations based on our product platform, which could result in reduced demand for our products. Additionally, as increasing adoption of distributed generation places pressure on traditional utility business models or utility infrastructure, utilities may change their pricing structures to increase the cost of installation or operation of solar distributed generation. Such measures can include grid access fees, costly or lengthy interconnection studies, limitations on distributed generation penetration levels, or other measures. If the cost of electricity generated by solar PV installations incorporating our solutions is high relative to the cost of electricity from other sources, our business, financial condition and results of operations may be harmed.

If we do not forecast demand for our products accurately, we may experience product shortages, delays in product shipment, excess product inventory, difficulties in planning expenses or disputes with suppliers, any of which will adversely affect our business and financial condition.

We manufacture our products according to our estimates of customer demand. This process requires us to make multiple forecasts and assumptions relating to the demand of our distributors, their end customers and general market conditions. Because we sell most of our products to distributors, who in turn sell to their end customers, we have limited visibility as to end-customer demand. We depend significantly on our distributors to provide us visibility into their end-customer demand, and we use these forecasts to make our own forecasts and planning decisions. If the information from our distributors turns out to be incorrect, then our own forecasts may also be inaccurate. Furthermore, we do not have long-term purchase commitments from our distributors or end customers, and our sales are generally made by purchase orders that may be canceled, changed or deferred without notice to us or penalty. As a result, it is difficult to forecast future customer demand to plan our operations.

If we overestimate demand for our products, or if purchase orders are canceled or shipments are delayed, we may have excess inventory that we cannot sell. We may have to make significant provisions for inventory write-downs based on events that are currently not known, and such provisions or any adjustments to such provisions could be material. We may also become involved in disputes with our suppliers who may claim that we failed to fulfill forecast or minimum purchase requirements. Conversely, if we underestimate demand, we may not have sufficient inventory to meet end-customer demand, and we may lose market share, damage relationships with our distributors and end customers and forgo potential revenue opportunities. Obtaining additional supply in the face of product shortages may be costly or impossible, particularly in the short term and in light of our outsourced manufacturing processes, which could prevent us from fulfilling orders in a timely and cost-efficient manner or at all. In addition, if we overestimate our production requirements, our contract manufacturers may purchase excess components and build excess inventory. If our contract manufacturers, at our request, purchase excess components that are unique to our products and are unable to recoup the costs of such excess through resale or return or build excess products, we could be required to pay for these excess parts or products and recognize related inventory write-downs.

In addition, we plan our operating expenses, including research and development expenses, hiring needs and inventory investments, in part on our estimates of customer demand and future revenue. If customer demand or revenue for a particular period is lower than we expect, we may not be able to proportionately reduce our fixed operating expenses for that period, which would harm our operating results for that period.

Our focus on a limited number of specific markets increases risks associated with the modification, elimination or expiration of governmental subsidies and economic incentives for on-grid solar electricity applications.

To date, we have generated the majority of our revenues from North America and expect to continue to generate a substantial amount of our revenues from North America in the future. There are a number of important incentives that are expected to phase-out or terminate in the future, which could adversely affect sales of our products. A substantial majority of our revenues come from the U.S., which has both federal and state incentives. For instance, the Renewable Energy and Job Creation Act of 2008 provided a 30% federal tax credit for residential and commercial solar installations through December 31, 2019, which is currently reduced to a tax credit of 26% through December 31, 2020 and 22% thereafter to December 31, 2021 before being reduced to 10% for commercial installations and 0% for residential installations beginning on January 1, 2022. These tax credits could be reduced or eliminated as part of tax code changes or regulatory reform initiatives by the current Congress and presidential administration.

In addition, net energy metering tariffs are being evaluated and, in some instances modified, which may have a negative impact on future inverter sales. We derive a significant portion of our revenues from California's residential solar market and the existing California net energy metering tariff has been very successful in incentivizing the installation of residential solar power systems. Future legislative or regulatory changes in California may discourage further growth in the residential solar market.

A number of European countries, including Germany, Belgium, Italy and the United Kingdom have adopted reductions in or concluded their net energy metering or FiT programs. Certain countries have proposed or enacted taxes levied on renewable energy. These and related developments have significantly impacted the solar industry in Europe and may adversely affect the future demand for the solar energy solutions in Europe.

We also sell our products in Australia. In 2012 Australia enacted a Renewable Energy Target (RET) that is intended to ensure that 33,000 Gigawatt-hours of Australia's electricity comes from renewable sources by 2020. This policy supports both the installation of large-scale centralized renewable generation projects, along with small-scale systems of under 100kW each for residential and small business customers. 2018 saw the introduction of state-based incentive schemes, aimed at solar customers in the state of Victoria and battery storage in the state of South Australia. Other Australian states and territories introduced similar programs in 2019. Any change in, or failure to implement, these programs may adversely affect the demand for solar energy solutions in Australia.

U.S. federal and state tax credits, grants and other incentive programs have had a positive effect on our sales since inception. However, unless these programs are further extended or modified to allow for continued growth in the residential solar market, the phase-out of such programs could adversely affect sales of our products in the future. Reductions in incentives and uncertainty around future energy policy, including local content requirements, have negatively affected and may continue to negatively affect our business, financial condition, and results of operations as we seek to increase our business domestically and abroad. Additionally, as we further expand to other countries, changes in incentive programs or electricity policies could negatively affect returns on our investments in those countries as well as our business, financial condition, and results of operations.

Changes in current laws or regulations or the imposition of new laws or regulations, or new interpretations thereof, by federal or state agencies or foreign governments could impair our ability to compete in international markets.

Changes in current laws or regulations, or the imposition of new laws and regulations around the world, could materially and adversely affect our business, financial condition and results of operations. In addition, changes in our products or further changes in tariffs, export and import laws and implementing regulations may create delays in the introduction of new products in international markets, prevent our customers from deploying our products internationally or, in some cases, prevent the export or import of our products to certain countries altogether.

For example, several states or territories, including California, Hawaii and Queensland, Australia, have either implemented or are considering implementing new restrictions on incentives or rules regulating the installation of solar power systems with which we may not be able to comply. In the event that we cannot comply with these or other new regulations or implement a solution to such noncompliance as they arise, the total market available for our microinverter products in such states, and our business as a result, may be adversely impacted.

While we are not aware of any other current or proposed export or import regulations that would materially restrict our ability to sell our products in countries where we offer our products for sale, any change in export or import regulations or related legislation, shift in approach to the enforcement or scope of existing regulations, or change in the countries, persons or technologies targeted by these regulations, could result in decreased use of our products by, or in our decreased ability to export or sell our products to, existing or potential customers with international operations. In such event, our business and results of operations could be adversely affected.

The threat of global economic, capital markets and credit disruptions, including sovereign debt issues, pose risks for our business.

The threat of global economic, capital markets and credit disruptions pose risks for our business. These risks include slower economic activity and investment in projects that make use of our products and services. These economic developments, particularly decreased credit availability, have in the past reduced demand for solar products. For instance, the European sovereign debt crisis in recent years has caused and may continue to cause European governments to reduce, eliminate or allow to expire government subsidies and economic incentives for solar energy, which could limit our growth or cause our net sales to decline and materially and adversely affect our business, financial condition, and results of operations. These conditions, including reduced incentives, continued decreases in credit availability, as well as continued economic instability, have and may continue to adversely impact our business, financial condition and results of operations as we seek to increase our sales internationally.

We have a history of losses which may continue in the future, and we cannot be certain that we will sustain profitability.

For the first year since our inception, we had net income of $161.1 million in the year ended December 31, 2019, compared to the years ended December 31, 2018 and 2017 where we incurred net losses of $11.6 million and $45.2 million, respectively. We incurred substantial net losses from our inception through the year ended December 31, 2018, and we may not be able to sustain profitability and may incur additional losses in the future. At December 31, 2019, we had an accumulated deficit of $185.2 million. Our revenue growth may slow or revenue may decline for a number of reasons, many of which are outside our control, including a decline in demand for our offerings, increased competition, a decrease in the growth of the solar industry or our market share, future declines in average selling prices of our products, the impact of U.S. trade tariffs, the imposition of additional tariffs applicable to our industry or our products, or our failure to capitalize on growth opportunities. If we fail to generate sufficient revenue to support our operations, we may not be able to sustain profitability.

Problems with product quality or product performance may cause us to continue to incur additional warranty expenses and may damage our market reputation and cause our revenue and gross profit to decline.

We offered 15-year limited warranties for our first and second generation microinverters and have offered a limited warranty of up to 25 years on each subsequent generation microinverters, including the current generation. Our limited warranties cover defects in materials and workmanship of our microinverters under normal use and service conditions for up to 25 years following installation. As a result, we bear the risk of warranty claims long after we have sold the product and recognized revenue. Our estimated costs of warranty for previously sold products may change depending on a number of factors, including failure rates and cost of providing replacement products.

While we offer warranties of up to 25 years, our microinverters have only been in use since mid-2008, when we first commenced commercial sales of our products. Although we conduct accelerated life cycle testing to measure performance and reliability, our solutions have not been tested over the full warranty cycle and do not have a sufficient operating history to confirm how they will perform over their estimated useful life. In addition, under real-world operating conditions, which may vary by location and design, as well as insolation, soiling and weather conditions, a typical solar PV installation may perform in a different way than under standard test conditions. If our products perform below expectations or have unexpected reliability problems, we may be unable to gain or retain customers and could face substantial warranty expense.

We are required to make assumptions and apply judgments, based on our accelerated life cycle testing and the limited operating history of our products, regarding a number of factors, including the durability and reliability of our products, our anticipated rate of warranty claims and the costs of replacement of defective products. Our assumptions have proved and could in the future prove to be materially different from the actual performance of our products, which has caused and may in the future cause us to incur substantial expense to repair or replace defective products. Increases in our estimates of future warranty obligations due to actual product failure rates, field service obligations and rework costs incurred in correcting product failures have caused and could in the future cause us to materially increase the amount of warranty obligations and have had, and may have in the future, a corresponding negative impact on our results of operations.

We also depend significantly on our reputation for reliability and high-quality products and services, exceptional customer service and our brand name to attract new customers and grow our business. If our products and services do not perform as anticipated or we experience unexpected reliability problems or widespread product failures, our brand and reputation could be significantly impaired, and we may lose, or be unable to gain or retain, customers.

Defects and poor performance in our products could result in loss of customers, decreased revenue and unexpected expenses, and increases in warranty, indemnity and product liability claims arising from defective products.

Our products must meet stringent quality requirements and may contain undetected errors or defects, especially when new generations are released. Errors, defects or poor performance can arise due to design flaws, defects in raw materials or components or manufacturing difficulties, which can affect both the quality and the yield of the product. These errors or defects may be dangerous, as defective power components may cause power overloads, potentially resulting in explosion or fire. As we develop new generations of our products and enter new markets, we face higher risk of undetected defects because our testing protocols may not be able to fully test the products under all possible operating conditions. In the past, we have experienced defects in our products due to errors in the manufacturing and design process. Any actual or perceived errors, defects or poor performance in our products could result in the replacement or recall of our products, shipment delays, rejection of our products, damage to our reputation, lost revenue, diversion of our engineering personnel from our product development efforts in order to address or remedy any defects, and increases in customer service and support costs, all of which could have a material adverse effect on our business and operations.

Furthermore, defective, inefficient or poorly performing power components may give rise to warranty, indemnity or product liability claims against us that exceed any revenue or profit we receive from the affected products. We could incur significant costs and liabilities if we are sued and if damages are awarded against us. We currently maintain a moderate level of product liability insurance, and there can be no assurance that this insurance will provide sufficient coverage in the event of a claim. Also, we cannot predict whether we will be able to maintain this coverage on acceptable terms, if at all, or that a product liability claim would not harm our business or financial condition. Costs or payments we may make in connection with warranty and product liability claims or product recalls may adversely affect our financial condition and results of operations.

Our Enlighten web-based monitoring service, which our installers and end-user customers use to track and monitor the performance of their solar PV systems, may contain undetected errors, failures, or bugs, especially when new versions or enhancements are released. We have from time to time found defects in our service and new errors in our existing service may be detected in the future. Any errors, defects, disruptions in service or other performance problems with our monitoring service could harm our reputation and may damage our customers' businesses.

Natural disasters, public health events, terrorist or cyber-attacks, or other catastrophic events could harm our operations.

Our worldwide operations could be subject to natural disasters, public health events and other business disruptions, which could harm our future revenue and financial condition and increase our costs and expenses. For example, our corporate headquarters in Fremont, California is located near major earthquake fault lines and our Petaluma, California facility is near fault lines and the sites of recent catastrophic wild fires. Further, a terrorist attack or cyber-attack, including one aimed at energy or communications infrastructure suppliers or our cloud-based monitoring service, could hinder or delay the development and sale or performance of our products. In the event that an earthquake, fire, tsunami, typhoon, terrorist or cyber-attack, or other natural, manmade or technical catastrophe were to damage or destroy any part of our facilities or those of our contract manufacturer, destroy or disrupt vital infrastructure systems or interrupt our operations or services for any extended period of time, our business, financial condition and results of operations would be materially and adversely affected.

We rely on third-party manufacturing facilities including for all product assembly and final testing of our products which is performed at third-party manufacturing facilities, in China and Mexico. There may be conflict or uncertainty in the countries in which we operate, including public health issues (for example, an outbreak of a contagious disease such as 2019-Novel Coronavirus (2019-nCoV), avian influenza, measles or Ebola), safety issues, natural disasters, fire, disruptions of service from utilities, nuclear power plant accidents or general economic or political factors. Any of the above risks, should they occur, could result in an increase in the cost of components, production delays, general business interruptions, delays from difficulties in obtaining export licenses for certain technology, tariffs and other barriers and restrictions, longer payment cycles, increased taxes, restrictions on the repatriation of funds and the burdens of complying with a variety of foreign laws, any of which could ultimately have a material adverse effect on our business.

We could be subject to breaches of our information technology systems, which could cause significant reputational, legal and financial damages.

Like many companies, we use and store a wide variety of confidential and proprietary information relating to our business. Although we make significant efforts to maintain the security and integrity of our information technology and related systems, and have implemented measures to manage the risk of a security breach or disruption, there can be no assurance that our security efforts and measures will be effective, or that attempted security breaches or disruptions would not be successful or damaging.

We devote substantial resources to network security, data encryption, and other security measures to protect our systems and data, but these security measures cannot provide absolute security. The techniques used in attempted cyber-attacks and intrusions are sophisticated and constantly evolving, and may be difficult to detect for long periods of time. We may be unable to anticipate these techniques or implement adequate preventative measures. Although to date we have not experienced breaches of our systems that have had a material adverse effect on our business, attacks and intrusions on our systems will continue and we may experience a breach of our systems that compromises sensitive company information or customer data. In addition, hardware, software, or applications we develop or procure from third parties may contain defects in design or manufacture or other problems that could unexpectedly compromise information security. If we experience a significant data security breach, we could be exposed to reputational damage and significant costs, including to rebuild our systems, modify our products and services, defend litigation, respond to government enforcement actions, pay damages or take other remedial steps, any of which could adversely affect our business, results of operations, and financial condition.

We may also share information with contractors and third-party providers to conduct our business. Although such contractors and third-party providers typically implement encryption and authentication technologies to secure the transmission and storage of data, those third-party providers may experience a significant data security breach, which may also detrimentally affect our business, results of operations, and financial condition.

Any unauthorized access to, or disclosure or theft of personal information we gather, store or use could harm our reputation and subject us to claims or litigation.

We receive, store and use certain personal information of our customers, and the end-users of our customers' solar PV systems, including names, addresses, e-mail addresses, credit information and energy production statistics. We also store and use personal information of our employees. We take steps to protect the security, integrity and confidentiality of the personal information we collect, store and transmit, but there is no guarantee that inadvertent or unauthorized use or disclosure will not occur or that third parties will not gain unauthorized access to this information despite our efforts. Because techniques used to obtain unauthorized access or sabotage systems change frequently and generally are not identified until they are launched against a target, we and our suppliers or vendors may be unable to anticipate these techniques or to implement adequate preventative or mitigation measures.

In May 25, 2018, the European Union, or EU, implemented the General Data Protection Regulation, or GDPR, a broad data protection framework that expands the scope of current EU data protection law to non-European Union entities that process, or control the processing of, the personal information of EU subjects. The GDPR allows for the imposition of fines and corrective action on entities that improperly use or disclose the personal information of EU subjects, including through a data security breach. In June 2018, the state of California enacted the California Consumer Privacy Act of 2018 or CCPA, which contains requirements similar to GDPR for the handling of personal information of California residents, which became effective in January 2020. The CCPA establishes a privacy framework for covered businesses, including an expansive definition of personal information and data privacy rights for California residents. The CCPA includes a framework with potentially severe statutory damages and private rights of action. The CCPA requires covered companies to provide new disclosures to California consumers (as that word is broadly defined in the CCPA), provide such consumers new ways to opt-out of certain sales of personal information, and allow for a new cause of action for data breaches. It remains unclear how the CCPA will be interpreted, but as currently written, it will likely impact our business activities and exemplifies the vulnerability of our business to not only cyber threats but also the evolving regulatory environment related to personal data. As we expand our operations, the CCPA may increase our compliance costs and potential liability. Some observers have noted that the CCPA could mark the beginning of a trend toward more stringent privacy legislation in the United States. Other states are beginning to pass similar laws.

Our and our collaborators' and contractors' failure to fully comply with GDPR, CCPA and other laws could lead to significant fines and require onerous corrective action. In addition, data security breaches experienced by us, our collaborators or contractors could result in the loss of trade secrets or other intellectual property, public disclosure of sensitive commercial data, and the exposure of personally identifiable information (including sensitive personal information) of our employees, customers, collaborators and others. Compliance with these and any other applicable privacy and data security laws and regulations is a rigorous and time-intensive process, and we may be required to put in place additional mechanisms ensuring compliance with the new data protection rules. Furthermore, the laws are not consistent, and compliance with various different requirements may be costly. If we fail to comply with any such laws or regulations, we may face significant fines and penalties that could adversely affect our business, financial condition and results of operations.

Unauthorized use or disclosure of, or access to, any personal information maintained by us or on our behalf, whether through breach of our systems, breach of the systems of our suppliers or vendors by an unauthorized party, or through employee or contractor error, theft or misuse, or otherwise, could harm our business. If any such unauthorized use or disclosure of, or access to, such personal information was to occur, our operations could be seriously disrupted, and we could be subject to demands, claims and litigation by private parties, and investigations, related actions, and penalties by regulatory authorities. In addition, we could incur significant costs in notifying affected persons and entities and otherwise complying with the multitude of foreign, federal, state and local laws and regulations relating to the unauthorized access to, or use or disclosure of, personal information. Finally, any perceived or actual unauthorized access to, or use or disclosure of, such information could harm our reputation, substantially impair our ability to attract and retain customers and have an adverse impact on our business, financial condition and results of operations.

If we fail to protect, or incur significant costs in defending, our intellectual property and other proprietary rights, our business and results of operations could be materially harmed.

Our success depends to a significant degree on our ability to protect our intellectual property and other proprietary rights. We rely on a combination of patent, trademark, copyright, trade secret and unfair competition laws, as well as confidentiality and license agreements and other contractual provisions, to establish and protect our intellectual property and other proprietary rights. We have applied for patent and trademark registrations in the U.S. and in other countries, some of which have been issued. We cannot guarantee that any of our pending applications will be approved or that our existing and future intellectual property rights will be sufficiently broad to protect our proprietary technology, and any failure to obtain such approvals or finding that our intellectual property rights are invalid or unenforceable could force us to, among other things, rebrand or re-design our affected products. In countries where we have not applied for patent protection or where effective intellectual property protection is not available to the same extent as in the U.S., we may be at greater risk that our proprietary rights will be misappropriated, infringed or otherwise violated.

To protect our unregistered intellectual property, including our trade secrets and know-how, we rely in part on trade secret laws and confidentiality and invention assignment agreements with our employees and independent contractors. We also require other third parties who may have access to our proprietary technologies and information to enter into non-disclosure agreements. Such measures, however, provide only limited protection, and we cannot assure that our confidentiality and non-disclosure agreements will prevent unauthorized disclosure or use of our confidential information, especially after our employees or third parties end their employment or engagement with us, or provide us with an adequate remedy in the event of such disclosure. Furthermore, competitors or other third parties may independently discover our trade secrets, copy or reverse engineer our products or portions thereof, or develop similar technology. If we fail to protect our intellectual property and other proprietary rights, or if such intellectual property and proprietary rights are infringed, misappropriated or otherwise violated, our business, results of operations or financial condition could be materially harmed.

In the future, we may need to take legal action to prevent third parties from infringing upon or misappropriating our intellectual property or from otherwise gaining access to our technology. Protecting and enforcing our intellectual property rights and determining their validity and scope could result in significant litigation costs and require significant time and attention from our technical and management personnel, which could significantly harm our business. In addition, we may not prevail in such proceedings. An adverse outcome of any such proceeding may reduce our competitive advantage or otherwise harm our financial condition and our business.

We may be subject to disruptions or failures in information technology systems and network infrastructures that could have a material adverse effect on our business and financial condition.

We rely on the efficient and uninterrupted operation of complex information technology systems and network infrastructures to operate our business. In addition, our Enlighten web-based monitoring service, which our installers and end-user customers use to track and monitor the performance of their solar PV systems, is dependent on cloud-based hosting services, along with the availability of WiFi or mobile data services at end-user premises. A disruption, infiltration or failure of our information technology systems, third-party cloud hosting platforms or end-user data services as a result of software or hardware malfunctions, system implementations or upgrades, computer viruses, cyber-attacks, third-party security breaches, employee error, theft or misuse, malfeasance, power disruptions, natural disasters or accidents could cause breaches of data security, failure of our Enlighten service, loss of intellectual property and critical data and the release and misappropriation of sensitive competitive information and partner, customer and employee personal data. We have been and may in the future be subject to fraud attempts from outside parties through our electronic systems (such as “phishing” e-mail communications to our finance, technical or other personnel), which could put us at risk for harm from fraud, theft or other loss if our internal controls do not operate as intended. Any of these events could harm our competitive position, result in a loss of customer confidence, cause us to incur significant costs to remedy any damages and ultimately materially adversely affect our business and financial condition.

The failure to successfully integrate our products with those of SunPower could have a material adverse effect on our business, financial condition and results of operations.

In August 2018, we entered into a master supply agreement (“MSA”) with SunPower, from whom we also purchased certain intellectual property and other assets as part of the Asset Purchase Agreement (“APA”) transaction. Our failure to successfully integrate our microinverter products and software with SunPower’s solar modules could frustrate the purposes of our acquisition of SunPower’s assets, negatively impact our revenue projections, impair goodwill, intangible assets recognized, and otherwise have a material adverse effect on our business, financial condition and results of operations.

As part of the APA transaction, we recognized $36.2 million of finite-lived intangible assets for developed technology and customer relationship and $21.1 million of goodwill. We make assumptions and estimates in this assessment which are complex and often subjective. Our judgement and estimates can be affected by a variety of factors, including external factors such as industry and economic trends, and internal factors such as changes in our business strategy or our internal forecasts. To the extent that the factors described above change, we could be required to record additional non-cash impairment charges in the future, which could negatively affect our results of operations.

We may fail to realize some or all of the anticipated benefits of the SunPower transaction which may result in conflicts between us and SunPower.

Our ability to realize the anticipated benefits of the SunPower transaction will depend, to a large extent, on our ability to successfully execute the terms of the MSA, which could be a complex and time-consuming process. Any delay, failure or breach of obligations under the MSA could adversely impact the expected benefits of the transaction and could otherwise have a material adverse effect on our business, financial condition and results of operations.

Additionally, in connection with the APA transaction, SunPower acquired 7.5 million shares of our common stock and has the right to designate one member of our board of directors. Through its share ownership and board seat, SunPower may have the ability to directly or indirectly influence our business, and conflicts may arise between us and SunPower regarding corporate priorities and strategic objectives. As of December 31, 2019, SunPower held 6.5 million shares of the our common stock.

Future acquisitions could materially and adversely affect our results of operations.

We may in the future seek to expand our business through further acquisitions and strategic transactions. Such transactions involve a number of risks that could harm our business or result in us not achieving anticipated benefits, including issues with integrating acquired businesses, the diversion of management time and attention, failures in due diligence or in identifying financial and legal liabilities and other risks, transaction related impairments or financial charges and the assumption of liabilities. In our future transactions, we may also decide to pay all or a portion of the transaction consideration through dilutive equity issuances, and our future acquisitions may require significant reductions in our available cash or the incurrence of indebtedness, all of which could harm our operating results.

If we are unable to effectively manage our operations, our business and operating results may suffer.

We have experienced, and expect to experience in the future, volatility in our sales and operations. Our historical growth and our more recent cost reduction initiatives have placed, and are expected to continue to place, significant demands on our management as well as our financial and operational resources, to:

- manage a dynamic organization;
- expand third-party manufacturing, testing and distribution capacity;
- execute on our cost reduction efforts and product initiatives with reduced headcount;
- build additional custom manufacturing test equipment;
- manage an increasing number of relationships with customers, suppliers and other third parties;
- manage acquired businesses or technologies and integration efforts related to acquisitions;
- increase our sales and marketing efforts;
- train and manage a dynamic and increasingly international employee base;
- broaden our customer support capabilities; and
- implement new and upgrade existing operational and financial systems.

We cannot assure you that our current and planned operations, personnel, systems, internal procedures and controls will be adequate to support our future operations. If we cannot manage our sales and operations effectively, we may be unable to take advantage of market opportunities, execute our business strategies or respond to competitive pressures, any of which could have a material adverse effect on our financial condition, results of operations, business or prospects.

We could be adversely affected by any violations of the FCPA, the U.K. Bribery Act, and other foreign anti-bribery laws.

The U.S. Foreign Corrupt Practices Act (“FCPA”) generally prohibits companies and their intermediaries from making improper payments to non-U.S. government officials for the purpose of obtaining or retaining business. Other countries in which we operate also have anti-bribery laws, some of which prohibit improper payments to government and non-government persons and entities, and others (e.g., the FCPA and the U.K. Bribery Act) extend their application to activities outside of their country of origin. Our policies mandate compliance with all applicable anti-bribery laws. We currently operate in, and may further expand into, key parts of the world that have experienced governmental corruption to some degree and, in certain circumstances, strict compliance with anti-bribery laws may conflict with local customs and practices. In addition, due to the level of regulation in our industry, our entry into new jurisdictions through internal growth or acquisitions requires substantial government contact where norms can differ from U.S. standards. Although, we implement policies and procedures and conduct training designed to facilitate compliance with these anti-bribery laws, thereby mitigating the risk of violations of such laws, our employees, subcontractors, agents and partners may take actions in violation of our policies and anti-bribery laws. Any such violation, even if prohibited by our policies, could subject us to criminal or civil penalties or other sanctions, which could have a material adverse effect on our business, financial condition, cash flows, and reputation.

Ordering patterns from our distributors may cause our revenue to fluctuate significantly from period to period.

Our distributors place purchase orders with us based on their assessment of end-customer demand and their forecasts. Because these forecasts may not be accurate, channel inventory held at our distributors may fluctuate significantly due to the difference between their forecasts and actual demand. As a result, distributors may adjust their purchase orders placed with us in response to changing channel inventory levels, as well as their assessment of the latest market demand trends. In addition, our distributors may change their inventory practices on short notice for any reason. We may build inventories during periods of anticipated growth, and the cancellation or deferral of product orders or overproduction due to failure of anticipated orders to materialize could result in excess or obsolete inventory, which could result in write-downs of inventory and an adverse effect on gross margins and operating results.

Further, we have limited visibility into future end customer demand. A significant decrease in our distributors' channel inventory in one period may lead to a significant rebuilding of channel inventory in subsequent periods, or vice versa, which may cause our quarterly revenue and operating results to fluctuate significantly. This fluctuation may cause our results to fall short of analyst or investor expectations in a certain period, which may cause our stock price to decline.

If potential owners of solar PV systems based on our product platform are unable to secure financing on acceptable terms, we could experience a reduction in the demand for our solar PV systems.

Many owners of solar PV systems depend on financing to purchase their systems. The limited use of microinverters to date, coupled with our relatively smaller size and capitalization compared to some of our competitors, could result in lenders refusing to provide the financing necessary to purchase solar PV systems based on our product platform on favorable terms, or at all. Moreover, in the case of debt financed projects, even if lenders are willing to finance the purchase of these systems, an increase in interest rates or a change in tax incentives could make it difficult for owners to secure the financing necessary to purchase a solar PV system on favorable terms, or at all. In addition, we believe that a significant percentage of owners purchase solar PV systems as an investment, funding the initial capital expenditure through a combination of upfront cash and financing. Difficulties in obtaining financing for solar PV systems on favorable terms or increases in interest rates or changes in tax incentives, could lower an investor's return on investment in a solar PV system, or make alternative solar PV systems or other investments more attractive relative to solar PV systems based on our product platform. Any of these events could result in reduced demand for our products, which could have a material adverse effect on our financial condition and results of operations. In addition, a significant share of residential solar installations has been provided through third-party financing structures, such as power purchase or lease agreements. Our sales growth may depend on sales to developers of third-party solar finance offerings who provide solar as a service via power purchase agreements or leasing structures. The third-party finance market for residential solar in the U.S. and elsewhere is or may become highly concentrated, with a few significant finance companies and several smaller entrants. If we are unable develop relationships and gain a significant share of inverter sales to the major finance companies or new entrants, our overall sales growth could be constrained.

Our success in "AC module" versions of our microinverter system will depend in part upon our ability to continue to work closely with leading solar module manufacturers.

We continue to work on variants of our microinverter systems that enable direct attachment of a microinverter to solar modules. The market success of such "AC Module" solutions will depend in part on our ability to continue to work closely with SunPower and other solar module manufacturers to design microinverters that are compatible with such direct attachment to solar modules. We may not be able to encourage solar module manufacturers to work with us on the development of such compatible solutions for a variety of reasons, including differences in marketing or selling strategy, competitive considerations, lack of competitive pricing, and technological compatibility. In addition, our ability to form effective partnerships with solar module manufacturers may be adversely affected by the substantial challenges faced by many of these manufacturers due to declining prices and revenues from sales of solar modules and the tariffs in the U.S.

Third parties may assert that we are infringing upon their intellectual property rights, which could divert management's attention, cause us to incur significant costs and prevent us from selling or using the technology to which such rights relate.

Our competitors and other third parties hold numerous patents related to technology used in our industry, and claims of patent or other intellectual property right infringement or violation have been litigated against our competitors. We may also be subject to such claims and litigation. Regardless of their merit, responding to such claims can be time consuming, divert management's attention and resources, and may cause us to incur significant expenses. While we believe that our products and technology do not infringe upon any intellectual property rights of third parties, we cannot be certain that we would be successful in defending against any such claims. Furthermore, patent applications in the U.S. and most other countries are confidential for a period of time before being published, so we cannot be certain that we are not infringing third parties' patent rights or that we were the first to conceive or protect inventions covered by our patents or patent applications. An adverse outcome with respect to any intellectual property claim could invalidate our proprietary rights and force us to do one or more of the following:

- obtain from a third-party claiming infringement a license to sell or use the relevant technology, which may not be available on reasonable terms, or at all;
- stop manufacturing, selling, incorporating or using products that embody the asserted intellectual property;

- pay substantial monetary damages;
- indemnify our customers under some of our customer contracts; or
- expend significant resources to redesign the products that use the infringing technology, or to develop or acquire non-infringing technology.

Any of these actions could result in a substantial reduction in our revenue and could result in losses over an extended period of time.

Our failure to obtain the right to use necessary third-party intellectual property rights on reasonable terms, or our failure to maintain, and comply with the terms and conditions applicable to these rights, could harm our business and prospects.

We have licensed, and in the future we may choose or be required to license, technology or intellectual property from third parties in connection with the development and marketing of our products. We cannot assure that such licenses will be available to us on commercially reasonable terms, or at all, and our inability to obtain such licenses could require us to substitute technology of lower quality or of greater cost. In addition, we incorporate open source software code in our proprietary software. Use of open source software can lead to greater risks than use of third-party commercial software, since open source licensors generally do not provide warranties or controls with respect to origin, functionality or other features of the software. Some open source software licenses require users who distribute open source software as part of their products to publicly disclose all or part of the source code in their software and make any derivative works of the open source code available for limited fees or at no cost. Although we monitor our use of open source software, open source license terms may be ambiguous, and many of the risks associated with the use of open source software cannot be eliminated. If we were found to have inappropriately used open source software, we may be required to release our proprietary source code, re-engineer our software, discontinue the sale of certain products in the event re-engineering cannot be accomplished on a timely basis, or take other remedial action. Furthermore, if we are unable to obtain or maintain licenses from third parties or fail to comply with open source licenses, we may be subject to costly third party claims of intellectual property infringement or ownership of our proprietary source code. Any of the above could harm our business and put us at a competitive disadvantage.

Our business has been and could continue to be affected by seasonal trends and construction cycles.

We have been and could continue to be subject to industry-specific seasonal fluctuations, particularly in climates that experience colder or rainier weather during the winter months, such as northern Europe, Canada, and the U.S. In general, we expect our products in the second, third, and fourth quarters will be positively affected by seasonal customer demand trends, including solar economic incentives, weather patterns and construction cycles, preceded by a seasonally softer first quarter. In the U.S., customers will sometimes make purchasing decisions towards the end of the year in order to take advantage of tax credits or for budgetary reasons. In addition, construction levels are typically slower in colder and wetter months. In European countries with FiTs, the construction of solar PV systems may be concentrated during the second half of the calendar year, largely due to the annual reduction of the applicable minimum FiT and the fact that the coldest winter months are January through March. Accordingly, our business and quarterly results of operations could be affected by seasonal fluctuations in the future.

Conversion of our Convertible Notes may dilute the ownership interest of existing stockholders or may otherwise depress the price of our common stock.

In August 2018, we issued and sold a total of $65.0 million aggregate principal amount of our convertible senior notes due 2023 (the "Notes due 2023") in a private placement to qualified institutional buyers and an affiliate of the Company. In May 2019, we entered into separately and privately negotiated transactions with certain holders of the Notes due 2023 resulting in the repurchase and exchange of $60.0 million aggregate principal amount of the notes in consideration for the issuance of shares of common stock and separate cash payments. As of December 31, 2019, $5.0 million aggregate principal amount of the Notes due 2023 were outstanding.

In June 2019, we issued and sold a total of $132.0 million aggregate principal amount of our convertible senior notes due 2024 (the "Notes due 2024" and together with the Notes due 2023, the "Convertible Notes").

The conversion of some or all of the Convertible Notes may dilute the ownership interests of existing stockholders. Any sales in the public market of the common stock issuable upon such conversion could adversely affect prevailing market prices of our common stock. In addition, the existence of the Convertible Notes may encourage short selling by market participants because the conversion of the Convertible Notes could be used to satisfy short positions. In addition, the anticipated conversion of the Convertible Notes into shares of our common stock could depress the price of our common stock.

Servicing our debts requires a significant amount of cash, and we may not have sufficient cash flow from our business to pay our debts.

Our ability to make scheduled payments of the principal of, to pay interest on or to refinance our indebtedness, including the Convertible Notes, depends on our future performance, which is subject to economic, financial, competitive and other factors beyond our control. Our business may not continue to generate cash flow from operations in the future sufficient to service our debts, including the Convertible Notes, and make necessary capital expenditures. If we are unable to generate cash flow, we may be required to adopt one or more alternatives, such as selling assets, restructuring debt or obtaining additional equity capital on terms that may be onerous or highly dilutive. Our ability to refinance our indebtedness, including the Convertible Notes, will depend on the capital markets and our financial condition at such time. We may not be able to engage in any of those activities or engage in these activities on desirable terms, which could result in a default on our debt obligations, including our obligations under the Convertible Notes.

We may not have the ability to raise the funds necessary to repurchase the Convertible Notes upon a fundamental change or to repay the Notes due 2024 and the Notes due 2023 at maturity.

Holders of our Notes due 2024 will have the right to require us to repurchase all or a portion of their convertible notes upon the occurrence of a fundamental change at 100% of the principal amount of the Notes due 2024, plus accrued and unpaid interest. Fundamental change is defined in the Notes due 2024 Indenture entered into in connection with the Notes due 2024 financing and consists of events such as an acquisition of a majority of our outstanding common stock, an acquisition of our company or substantially all of our assets, the approval by our stockholders of a plan of liquidation or dissolution, or our common stock no longer being listed on the Nasdaq Global Select Market or the Nasdaq Global Market. We may not have enough available cash or be able to obtain financing at the time we are required to make such repurchase of the Notes due 2024.

Similarly, holders of our Notes due 2023 will have the right to require us to repurchase all or a portion of their convertible notes upon the occurrence of a fundamental change at 100% of the principal amount of the Notes due 2023, plus accrued and unpaid interest. Fundamental change is defined in the Notes due 2023 Indenture entered into in connection with the Notes due 2023 financing and consists of events such as an acquisition of a majority of our outstanding common stock, an acquisition of our company or substantially all of our assets, the approval by our stockholders of a plan of liquidation or dissolution, or our common stock no longer being listed on the Nasdaq Global Select Market or the Nasdaq Global Market. Moreover, we will be required to repay the Notes due 2023 in cash at their maturity, unless earlier converted or repurchased. However, we may not have enough available cash or be able to obtain financing at the time we are required to make repurchases of the Notes due 2023 surrendered or repay the Notes due 2023 at maturity.

If we do not have enough available cash at the time we are required to make the required repurchases of the Convertible Notes, we may be required to undertake one or more actions, such as selling assets, attempting to restructure the Convertible Notes or other debt, or obtaining additional capital on terms that may be onerous or highly dilutive. Any such actions could have a material adverse effect on our business, financial condition or results of operations.

The convertible note hedge and warrant transactions and/or their early termination may affect the value of our common stock.

In connection with the offering of the Notes due 2024, we entered into privately negotiated convertible note hedge transactions pursuant to which we have the option to purchase approximately the same number of shares of our common stock initially issuable upon conversion of the Notes due 2024, at a price approximately the same as the initial conversion price of the Notes due 2024. These transactions are expected to reduce the potential dilution with respect to our common stock upon conversion of the Notes due 2024. Separately, we also entered into privately negotiated warrant transactions to acquire the same number of shares of our common stock initially issuable upon conversion of the Notes due 2024 (subject to customary anti-dilution adjustments) at an initial strike price of approximately $25.23 per share. If the market value per share of our common stock, as measured under the warrants, exceeds the strike price of the warrants, the warrants will have a dilutive effect on the ownership interests of existing stockholders and on our earnings per share, unless we elect, subject to certain conditions, to settle the warrants in cash. However, we may not have enough available cash or be able to obtain financing at the time of settlement.

In addition, the existence of the convertible note hedge and warrant transactions may encourage purchasing and selling share of our common stock, or other of our securities and instruments, in open market and/or privately negotiated transactions in order to modify hedge positions. Any of these activities could adversely affect the value of our common stock and the value of the Notes due 2024.

Changes in current accounting methods, standards, or regulations applicable to the Convertible Notes due 2024 could have a material impact on our reported financial results, future financial results, future cash flows, and/or our stock price.

Under Accounting Standards Codification ("ASC") 470-20, "Debt with Conversion and Other Options," an entity must separately account for the liability and equity components of convertible debt instruments, such as the Notes due 2024, that may be settled entirely or partially in cash upon conversion, in a manner that reflects the issuer's economic interest cost. Accordingly, we have included the equity component in the additional paid-in capital section of stockholders' equity on our consolidated balance sheet at the issuance date, and we have treated the value of the equity component as debt discount for the liability component. We are required to amortize the debt discount as non-cash interest expense over the term of the Notes due 2024, which could adversely affect our reported or future financial results or the trading price of our common stock.

In addition, we use the treasury stock method for convertible debt instruments (such as the Notes due 2024) that may be settled entirely or partly in cash, and the effect of which is that any shares issuable upon conversion of the notes are not included in the calculation of diluted earnings per share except to the extent that the conversion value of such notes exceeds their principal amount. Under the treasury stock method, for diluted earnings per share purposes, the transaction is accounted for as if the number of shares of common stock that would be necessary to settle such excess conversion value, if we elected to settle such excess in shares, are issued. We cannot be sure that the accounting standards in the future will continue to permit use of the treasury stock method. If we are unable to use the treasury stock method in accounting for the shares issuable upon conversion of the Notes due 2024, then our diluted earnings per share will be adversely affected.

Accounting Standards Update ("ASU") 2016-15, "Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments," clarifies how certain cash receipts and payments should be classified in the statement of cash flows, including the cash settlement for our Notes due 2024. Upon cash settlement, repayment of the principal amount will be bifurcated between cash outflows for operating activities for the portion related to accreted interest attributable to debt discounts arising from the difference between the coupon interest rate and the effective interest rate, and financing activities for the remainder. This will require us to classify the $36.4 million of accreted interest as cash used in operating activities in our consolidated statement of cash flows upon cash settlement, which could adversely affect our future cash flow from operations.

We may not be able to raise additional capital to execute on our current or future business opportunities on favorable terms, if at all, or without dilution to our stockholders.

We believe that our existing cash and cash equivalents and cash flows from our operating activities will be sufficient to meet our anticipated cash needs for at least the next 12 months. However, we may need to raise additional capital or debt financing to execute on our current or future business strategies, including to:

- provide additional cash reserves to support our operations;

- invest in our research and development efforts;
- expand our operations into new product markets and new geographies;
- acquire complementary businesses, products, services or technologies; or
- otherwise pursue our strategic plans and respond to competitive pressures, including adjustments to our business to mitigate the effects of any tariffs that might apply to us or our industry.

We do not know what forms of financing, if any, will be available to us. If financing is not available on acceptable terms, if and when needed, our ability to fund our operations, enhance our research and development and sales and marketing functions, develop and enhance our products, respond to unanticipated events and opportunities, or otherwise respond to competitive pressures would be significantly limited. In any such event, our business, financial condition and results of operations could be materially harmed, and we may be unable to continue our operations. Moreover, if we raise additional funds through the issuance of equity or convertible debt securities, the percentage ownership of our stockholders could be significantly diluted, and these newly issued securities may have rights, preferences or privileges senior to those of existing stockholders.

If we fail to maintain an effective system of internal controls or are unable to remediate any deficiencies in our internal controls, we might not be able to report our financial results accurately or prevent fraud; in that case, our stockholders could lose confidence in our financial reporting, which would harm our business and could negatively impact the price of our stock.

Effective internal controls are necessary for us to provide reliable financial reports and prevent fraud. In addition, Section 404 of the Sarbanes-Oxley Act requires us to establish and maintain internal control over financial reporting and disclosure controls procedures. The process of implementing our internal controls and complying with Section 404 of the Sarbanes-Oxley Act has required, and will continue to require, significant attention of management. We are required to provide an auditor's attestation report on management's assessment of the effectiveness of our internal control over financial reporting, under Section 404(b) of the Sarbanes-Oxley Act, in conjunction with this Annual Report on Form 10-K. If we or our independent registered public accounting firm discover a material weakness in our internal controls over financial reporting, the disclosure of that fact, even if quickly remedied, could reduce the market's confidence in our financial statements and harm our stock price. To the extent any material weaknesses in our internal control over financial reporting are identified, we could be required to expend significant management time and financial resources to correct such material weaknesses or to respond to any resulting regulatory investigations or proceedings.

Our business is subject to potential tax liabilities.

We are subject to income tax, indirect tax or other tax claims by tax agencies in jurisdictions in which we conduct business. Significant judgment is required in determining our worldwide provision for income taxes. Tax laws are dynamic and subject to change as new laws are passed and new interpretations of the law are issued or applied. The Tax Cuts and Jobs Act of 2017 (the Tax Reform Act) contains many significant changes to the U.S. federal income tax laws, which the consequences of which could have a material impact on the value of our deferred tax assets and could increase our future U.S. income tax expense. As additional guidance is issued by the applicable taxing authorities and as new accounting treatment is clarified, we may report additional adjustments in the period if new information becomes available. We have a significant amount of deferred tax assets and a portion of the deferred tax assets related to net operating losses or tax credits could be subject to limitations under the Internal Revenue Code Section 382 or 383, separate return loss year rules. The limitations could reduce our ability to utilize our net operating losses or tax credits before the expiration of the tax attributes. Tax law changes or the limitations could be material and could materially affect our tax obligations and effective tax rate.

In the ordinary course of our business, there are many transactions and calculations where the ultimate income tax, indirect tax, or other tax determination is uncertain. Although we believe our tax estimates are reasonable, we cannot assure that the final determination of any tax audits and litigation will not be materially different from that which is reflected in historical tax provisions and accruals. Should additional taxes be assessed as a result of an audit, assessment or litigation, there could be a material adverse effect on our cash, tax provisions and net income (loss) in the period or periods for which that determination is made.

We are dependent on ocean transportation to deliver our products in a cost-efficient manner. If we are unable to use ocean transportation to deliver our products, our business and financial condition could be materially and adversely impacted.

We rely on commercial ocean transportation for the delivery of a large percentage of our products to our customers in North America, Europe, Australia and other markets. We also rely on more expensive air transportation when ocean transportation is not available or compatible with the delivery time requirements of our customers. Our ability to deliver our products via ocean transportation could be adversely impacted by shortages in available cargo capacity, changes by carriers and transportation companies in policies and practices, such as scheduling, pricing, payment terms and frequency of service or increases in the cost of fuel, taxes and labor; and other factors, such as labor strikes and work stoppages, not within our control. If we are unable to use ocean transportation, or are otherwise required to continue to substitute more expensive air transportation to meet delivery time requirements, our financial condition and results of operations could be materially and adversely impacted. Material interruptions in service or stoppages in transportation, whether caused by strike, work stoppage, lock-out, slowdown or otherwise, could materially and adversely impact our business, results of operations and financial condition.

The market price of our common stock may be volatile or may decline regardless of our operating performance.

The market price of our common stock has been and could be subject to wide fluctuations in response to, among other things, the risk factors described in this Annual Report on Form 10-K, and other factors beyond our control, such as fluctuations in the valuation of companies perceived by investors to be comparable to us. Furthermore, the stock markets have experienced price and volume fluctuations that have affected and continue to affect the market prices of equity securities of many companies. These fluctuations often have been unrelated or disproportionate to the operating performance of those companies. These broad market and industry fluctuations, as well as general economic, political and market conditions, such as recessions, interest rate changes or international currency fluctuations, may negatively affect the market price of our common stock. In the past, many companies that have experienced volatility in the market price of their stock have been subject to securities class action litigation. We may become the target of this type of litigation in the future. Securities litigation against us could result in substantial costs and divert our management's attention from other business concerns, which could seriously harm our business.

Our stock price has been volatile and may continue to be volatile.

The trading price of our common stock has been, and is likely to continue to be, volatile and could be subject to wide fluctuations in response to various factors, some of which are beyond our control. In addition, the trading prices of the securities of solar companies in general have been highly volatile, and the volatility in market price and trading volume of securities is often unrelated or disproportionate to the financial performance of the companies issuing the securities. Factors affecting the market price of our common stock, some of which are beyond our control, include:

- seasonal and other fluctuations in demand for our products;
- the timing, volume and product mix of sales of our products, which may have different average selling prices or profit margins;
- changes in our pricing and sales policies or the pricing and sales policies of our competitors;
- our ability to design, manufacture and deliver products to our customers in a timely and cost-effective manner and that meet customer requirements;
- our ability to manage our relationships with our contract manufacturers, customers and suppliers;
- quality control or yield problems in our manufacturing operations;
- the anticipation, announcement or introductions of new or enhanced products by our competitors and ourselves;
- reductions in the retail price of electricity;
- changes in laws, regulations and policies applicable to our business and products, particularly those relating to government incentives for solar energy applications;
- the impact of tariffs on the solar industry in general and our products in particular;
- unanticipated increases in costs or expenses;

- the amount and timing of operating costs and capital expenditures related to the maintenance and expansion of our business operations;
- the impact of government-sponsored programs on our customers;
- our exposure to the credit risks of our customers, particularly in light of the fact that some of our customers are relatively new entrants to the solar market without long operating or credit histories;
- our ability to estimate future warranty obligations due to product failure rates, claim rates or replacement costs;
- our ability to forecast our customer demand and manufacturing requirements, and manage our inventory;
- fluctuations in our gross profit;
- our ability to predict our revenue and plan our expenses appropriately;
- fluctuations in foreign currency exchange rates;
- announcement of acquisitions or dispositions of our assets or business operations;
- changes in our management;
- a relatively high percentage of non-institutional investors in our shareholder base, which may result in higher volatility to our stock due to more frequent trading by shareholders without a long-term investment horizon; and
- actions by research analysts, such as if they issue unfavorable commentary or downgrade our common stock or cease publishing reports about us or our business.

The above factors are difficult to forecast, and these, as well as other factors, could materially and adversely affect our quarterly and annual results of operations. Any failure to adjust spending quickly enough to compensate for a revenue shortfall could magnify the adverse impact of this revenue shortfall on our results of operations. Moreover, our results of operations may not meet our announced guidance or the expectations of research analysts or investors, in which case the price of our common stock could decrease significantly. There can be no assurance that we will be able to successfully address these risks.

Techniques employed by manipulative short sellers may drive down the market price of our common stock.

Short selling is the practice of selling securities that the seller does not own, but rather has borrowed from a third party with the intention of buying identical securities back at a later date to return to the lender. Short sellers hope to profit from a decline in the value of the securities between the sale of the borrowed securities and the purchase of the replacement shares, as the short seller expects to pay less in that purchase than it received in the sale. As it is in the short seller's best interests for the price of the stock to decline, some short sellers publish, or arrange for the publication of, negative opinions regarding the issuer and its business prospects in order to create negative market momentum and generate profits for themselves after selling a stock short. The use of the Internet, social media, and blogging have allowed short sellers to publicly attack a company's credibility, strategy and veracity by means of so-called "research reports" that mimic the type of investment analysis performed by legitimate securities research analysts. These short attacks have in the past led to stock price declines and significant selling activity in our common stock. Issuers with limited trading volumes or substantial retail shareholder bases can be particularly susceptible to higher volatility levels, and can be particularly vulnerable to such short attacks.

Short seller publications are not regulated by any governmental, self-regulatory organization or other official authority in the U.S., are not subject to the certification requirements imposed by the SEC in Regulation AC (Regulation Analyst Certification) and, accordingly, the opinions they express may be based on distortions of actual facts or, in some cases, outright fabrications. In light of the limited risks involved in publishing such information, and the significant profits that can be made from running successful short attacks, short sellers will likely continue to issue such reports. Such short-seller attacks may cause our stock to suffer a decline in market price.

Our affiliated stockholders, executive officers and directors own a significant percentage of our stock, and they may take actions that our other stockholders may not view as beneficial.

Our affiliated stockholders, executive officers and directors collectively own a significant percentage of our common stock. This significant concentration of share ownership may adversely affect the trading price for our common stock because investors often perceive disadvantages in owning stock in companies with controlling stockholders. Also, as a result, these stockholders, acting together, may be able to control our management and affairs and matters requiring stockholder approval, including the election of directors and approval of significant corporate transactions, such as mergers, consolidations or the sale of substantially all of our assets. Consequently, this concentration of ownership may have the effect of delaying or preventing a change in control, including a merger, consolidation or other business combination involving us, or discouraging a potential acquirer from making a tender offer or otherwise attempting to obtain control, even if this change in control would benefit our other stockholders.

Sales of a substantial number of shares of our common stock in the public market by our existing stockholders could cause our stock price to fall.

Sales of a substantial number of shares of our common stock in the public market or the perception that these sales might occur, could depress the market price of our common stock and could impair our ability to raise capital through the sale of additional equity securities. We are unable to predict the effect that sales may have on the prevailing market price of our common stock. All of the outstanding shares of our common stock are eligible for sale in the public market, subject in some cases to agreed limits on sale volumes and the volume limitations and manner of sale requirements of Rule 144 under the Securities Act. Sales of stock by our stockholders could have a material adverse effect on the trading price of our common stock.

Certain holders of our securities are entitled to rights with respect to the registration of their shares under the Securities Act. Registration of these shares under the Securities Act would result in the shares becoming freely tradable without restriction under the Securities Act. For instance, in December in 2018, we filed a resale registration statement related to 7.5 million shares of our common stock that were issued to SunPower upon the closing of the APA transaction. Any sales of securities by SunPower or other stockholders with registration rights could have a material adverse effect on the trading price of our common stock.

We currently do not intend to pay dividends on our common stock and, consequently, your only opportunity to achieve a return on your investment is if the price of our common stock appreciates.

We currently do not plan to declare dividends on shares of our common stock in the foreseeable future. In addition, our term loan agreement restricts our ability to pay dividends. Consequently, an investor's only opportunity to achieve a return on its investment in our company will be if the market price of our common stock appreciates and the investor sells its shares at a profit.

Our charter documents and Delaware law could prevent a takeover that stockholders consider favorable and could also reduce the market price of our stock.

Our certificate of incorporation and our bylaws contain provisions that could delay or prevent a change in control of our company. These provisions could also make it more difficult for stockholders to elect directors and take other corporate actions, including effecting changes in our management. These provisions include:

- providing for a classified board of directors with staggered, three-year terms, which could delay the ability of stockholders to change the membership of a majority of our board of directors;
- not providing for cumulative voting in the election of directors, which limits the ability of minority stockholders to elect director candidates;
- authorizing our board of directors to issue, without stockholder approval, preferred stock rights senior to those of common stock, which could be used to significantly dilute the ownership of a hostile acquiror;
- prohibiting stockholder action by written consent, which forces stockholder action to be taken at an annual or special meeting of our stockholders;

- requiring the affirmative vote of holders of at least 66 2/3% of the voting power of all of the then outstanding shares of voting stock, voting as a single class, to amend provisions of our certificate of incorporation relating to the management of our business, our board of directors, stockholder action by written consent, advance notification of stockholder nominations and proposals, forum selection and the liability of our directors, or to amend our bylaws, which may inhibit the ability of stockholders or an acquiror to effect such amendments to facilitate changes in management or an unsolicited takeover attempt;
- requiring special meetings of stockholders may only be called by our chairman of the board, if any, our chief executive officer, our president or a majority of our board of directors, which could delay the ability of our stockholders to force consideration of a proposal or to take action, including the removal of directors; and
- requiring advance notification of stockholder nominations and proposals, which may discourage or deter a potential acquiror from conducting a solicitation of proxies to elect the acquiror's own slate of directors or otherwise attempting to obtain control of us.

In addition, the provisions of Section 203 of the Delaware General Corporate Law may prohibit large stockholders, in particular those owning 15% or more of our outstanding common stock, from engaging in certain business combinations, without approval of substantially all of our stockholders, for a certain period of time.

These provisions in our certificate of incorporation, our bylaws and under Delaware law could discourage potential takeover attempts, reduce the price that investors might be willing to pay for shares of our common stock in the future and result in the market price being lower than it would be without these provisions.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

Our corporate headquarters occupy approximately 23,000 square feet in Fremont, California under a lease that expires in November 2023 and accommodates our executive offices, sales, marketing, operations, finance and administrative activities. We also occupy office buildings in Petaluma, California under leases that expires in April 2022 and accommodate our principal engineering activities. In addition, we occupy office space in Boise, Idaho, France, Netherlands, Australia, New Zealand and India. At this time, we believe our facilities are adequate for our near term operational and business needs.

Item 3. Legal Proceedings

From time to time, we may be involved in litigation relating to claims arising out of our operations. We are not currently involved in any material legal proceedings, and our management believes there are currently no claims or actions pending against us, the ultimate disposition of which could have a material adverse effect on our operations, financial condition, or cash flows. We may, however, be involved in material legal proceedings in the future. Such matters are subject to uncertainty and there can be no assurance that such legal proceedings will not have a material adverse effect on our business, results of operations, financial position or cash flows.

Item 4. Mine Safety Disclosures

Not applicable.

PART II

Item 5. Market for the Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

Common Stock

Our common stock, $0.00001 par value per share, has been traded on The Nasdaq Global Market under the symbol "ENPH" since March 30, 2012.

Holders

As of February 14, 2020, there were approximately 22 holders of record of our common stock, one of which was Cede & Co., a nominee for Depository Trust Company ("DTC"). All of the shares of our common stock held by brokerage firms, banks and other financial institutions as nominees for beneficial owners are deposited into participant accounts at DTC and are therefore considered to be held of record by Cede & Co. as one stockholder.

Dividend Policy

We have never paid any cash dividends on our common stock. We currently anticipate that we will retain any available funds to invest in the growth and operation of our business and we do not anticipate paying any cash dividends in the foreseeable future.

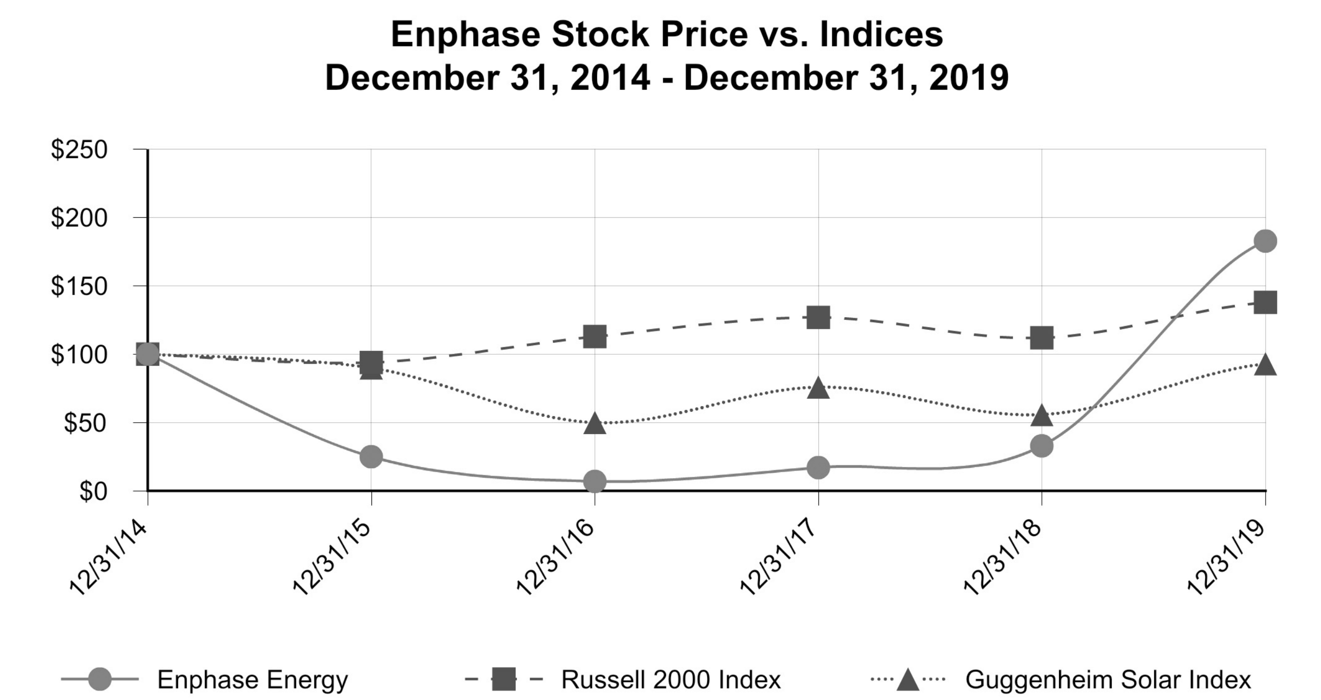
Recent Sales of Unregistered Securities

Except as previously reported in our quarterly reports on Form 10-Q and current reports on Form 8-K filed with the SEC during the year ended December 31, 2019, there were no unregistered sales of equity securities by us during the year ended December 31, 2019.

Stock Performance Graph

This section is not “soliciting material” and is not deemed “filed” for purposes of Section 18 of the Securities and Exchange Act of 1934 (the Exchange Act) or otherwise subject to the liabilities of that section, nor shall it be deemed incorporated by reference in any filing under the Securities Act of 1933 or the Exchange Act, regardless of any general incorporation language in such filing.

The graph depicted below shows a comparison of cumulative total stockholder returns for our common stock, the Russell 2000 and the Guggenheim Solar Index for the period from December 31, 2014 to December 31, 2019. An investment of $100 is assumed to have been made in our common stock and in each index on December 31, 2014, all dividends were reinvested, and the relative performance of the investments are tracked through December 31, 2019. The information shown is historical and stockholder returns over the indicated period should not be considered indicative of future stockholder returns or future performance.



	December 31, 2014	December 31, 2015	December 31, 2016	December 31, 2017	December 31, 2018	December 31, 2019
Enphase Energy, Inc.	$ 100	$ 25	$ 7	$ 17	$ 33	$ 183
Russell 2000 Index	$ 100	$ 94	$ 113	$ 127	$ 112	$ 138
Guggenheim Solar Index	$ 100	$ 90	$ 50	$ 76	$ 56	$ 93

Item 6. Selected Consolidated Financial Data

The information set forth below for the five years ended December 31, 2019 is not necessarily indicative of results of future operations, and should be read in conjunction with Item 7. “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” and the consolidated financial statements and related notes thereto included in Item 8. “Financial Statements and Supplementary Data,” of this Annual Report on Form 10-K to fully understand the factors that may affect the comparability of the information presented below.’

We adopted Accounting Standards Codification (“ASC”) No. 606, “Revenue Recognition” (“ASC 606” or “Topic 606”) and applied the modified retrospective method to all contracts that were not completed as of January 1, 2018. Financial data for the fiscal years ended December 31, 2017, 2016 and 2015 have not been adjusted to reflect the adoption of ASC 606.

	Years Ended December 31,				
	2019	2018	2017	2016	2015
	(in thousands, except per share data)				
Consolidated Statement of Operations Data:					
Net revenues	$ 624,333	$ 316,159	$ 286,166	$ 322,591	$ 357,249
Cost of revenues	403,088	221,714	230,123	264,583	249,032
Gross profit	221,245	94,445	56,043	58,008	108,217
Operating expenses:					
Research and development	40,381	32,587	33,157	50,703	50,819
Sales and marketing	36,728	27,047	23,126	38,810	45,877
General and administrative	38,808	29,086	22,221	27,418	30,830
Restructuring charges	2,599	4,129	16,917	3,777	—
Total operating expenses	118,516	92,849	95,421	120,708	127,526
Income (loss) from operations	102,729	1,596	(39,378)	(62,700)	(19,309)
Other expense, net					
Interest income	2,513	1,058	276	75	20
Interest expense	(9,691)	(10,693)	(8,212)	(2,848)	(521)
Other (expense) income, net	(5,437)	(2,190)	1,973	(514)	(893)
Total other expense, net	(12,615)	(11,825)	(5,963)	(3,287)	(1,394)
Income (loss) before income taxes	90,114	(10,229)	(45,341)	(65,987)	(20,703)
Income tax benefit (provision)	71,034	(1,398)	149	(1,475)	(1,379)
Net income (loss)	$ 161,148	$ (11,627)	$ (45,192)	$ (67,462)	$ (22,082)
Net income (loss) per share:					
Basic	$ 1.38	$ (0.12)	$ (0.54)	$ (1.34)	$ (0.49)
Diluted	$ 1.23	$ (0.12)	$ (0.54)	$ (1.34)	$ (0.49)
Shares used in per share calculation:					
Basic	116,713	99,619	82,939	50,519	44,632
Diluted	131,644	99,619	82,939	50,519	44,632

	As of December 31,				
	2019	2018	2017	2016	2015
			(in thousands)		
Consolidated Balance Sheet Data:					
Cash, cash equivalents and restricted cash	$ 296,109	$ 106,237	$ 29,144	$ 17,764	$ 28,452
Total assets	713,223	339,937	169,147	163,576	165,528
Warranty obligations	37,098	31,294	29,816	31,414	30,547
Debt	105,543	109,783	49,751	33,900	17,000
Total stockholders' equity	272,212	7,776	(9,126)	1,300	41,449
Additional Data:					
Working capital	$ 300,346	$ 75,141	$ 38,705	$ 35,092	$ 48,920
Gross margin percentage	35.4%	29.9%	19.6%	18.0%	30.3%

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

Forward-Looking Statements

The following discussion and analysis of our financial condition and results of operations should be read together with our consolidated financial statements and related notes appearing elsewhere in this Annual Report on Form 10-K. This discussion contains forward-looking statements reflecting our current expectations and involves risks and uncertainties. In some cases, you can identify forward-looking statements by terminology such as "may," "will," "should," "expect," "plan," "anticipate," "believe," "estimate," "predict," "intend," "potential" or "continue" or the negative of these terms or other comparable terminology. Such statements, include but are not limited to statements regarding our expectations as to future financial performance, expense levels, liquidity sources, the capabilities and performance of our technology and products and planned changes, timing of new product releases, our business strategies, including anticipated trends, growth and developments in markets in which we target, the anticipated market adoption of our current and future products, performance in operations, including component supply management, product quality and customer service, and the anticipated benefits and risks relating to the transaction with SunPower Corporation. Our actual results and the timing of events may differ materially from those discussed in our forward-looking statements as a result of various factors, including those discussed below and those discussed in the section entitled "Risk Factors" included in this report.

Overview and 2019 Highlights

We are a global energy technology company. We deliver smart, easy-to-use solutions that manage solar generation, storage and communication on one intelligent platform. We revolutionized the solar industry with our microinverter technology and we produce a fully integrated solar-plus-storage solution. We have shipped more than 25 million microinverters, and over one million Enphase residential and commercial systems have been deployed in more than 130 countries.

We sell our solutions primarily to distributors who resell them to solar installers. We also sell directly to large installers, OEMs, strategic partners and homeowners. Our revenue for the second half of 2019 was positively impacted by the scheduled phase-down of the investment tax credit for solar projects under Section 48(a) (the "ITC") of the Internal Revenue Code of 1986, as amended (the "Code"). The historical ITC percentage was 30% through 2019, and the ITC percentage decreased to 26% of the basis of a solar energy system that began construction during 2020, 22% for 2021, and zero for residential and 10% for commercial if construction begins after 2021 or if the solar energy system is placed into service after 2023. As a result, several of our customers explored opportunities to purchase products in 2019 to take advantage of safe harbor guidance from the IRS published in June 2018, allowing them to preserve the historical 30% investment tax credit for solar equipment purchased in 2019 for solar projects that are completed after December 31, 2019. These safe harbor purchases positively affected our revenues in the second half of 2019 and $49.9 million deferred revenue as of December 31, 2019 relates to safe harbor purchases to be shipped in the first quarter of 2020.

Our net revenues were $624.3 million, $316.2 million and $286.2 million for 2019, 2018 and 2017, respectively. We earned net income of $161.1 million for 2019 compared to net losses of $11.6 million and $45.2 million for 2018 and 2017, respectively. As of December 31, 2019, we had $251.4 million in cash and cash equivalents, $44.7 million in restricted cash and $300.3 million of working capital.

Our 2019 priorities included focusing on providing great customer service, high quality products, scaling business processes and profitable top line growth, and development of our Ensemble technology. Quality and customer service are the cornerstones of our strategy and were instrumental in our turnaround in financial performance in 2018 and 2019. We began by focusing on call center metrics in the U.S., Europe and Australia, and reduced the average wait time from over 10 minutes in 2017 to 2 minutes in 2018 to under 2 minutes by the end of 2019. We introduced self-service tools such as the Service-On-The-Go™ that allow our installers and partners to submit requests from their phone in less than 60 seconds.

The launch of our IQ 7 series microinverter worldwide, the smallest, lightest and most powerful microinverter we have ever made, was a key factor in improving gross margin. Every region of the world where our products are sold is now using this seventh-generation microinverter. During year ended December 31, 2019, 98% of our microinverter shipments were IQ 7. We systematically rolled out high-power and high-efficiency variants of the IQ 7 microinverters in 2018. Selling these variants simultaneously improved gross margin and delivered a better price per watt for the installer.

On January 28, 2019, we repaid in full the remaining principal amount of the Term Loans of approximately $39.5 million plus accrued interest and fees owed to lenders affiliated with Tennenbaum Capital Partners, LLC.

On May 30, 2019, we entered into separately and privately negotiated transactions with certain holders of our 4.0% Convertible Senior Notes due 2023 ("Notes due 2023") resulting in the repurchase and exchange, as of June 5, 2019, of $60.0 million aggregate principal amount of the notes in consideration for the issuance of 10,801,080 shares of common stock and separate cash payments totaling $6.0 million.

On June 5, 2019, we issued $132.0 million aggregate principal amount of our 1.0% Convertible Senior Notes due 2024 (the "Notes due 2024") in a private placement. The Notes due 2024 are general unsecured obligations and bear interest at a rate of 1.0% per year, payable semi-annually on June 1 and December 1 of each year, beginning on December 1, 2019. The Notes due 2024 will mature on June 1, 2024, unless earlier repurchased by us or converted at the option of the holders. Further information relating to the Notes due 2024 may be found in Note 11, "Debt," of the notes to consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K and below under "Liquidity and Capital Resources."

2020 Outlook

We believe our solid execution in 2019 positions us well to take advantage of future growth opportunities, and we need to maintain our focus in order to capitalize on such opportunities. Our top three priorities for 2020 are (i) providing a remarkable customer experience, (ii) introduction of new products and expansion of our markets, and (iii) focus on enhancements to our comprehensive digital platform.

Customer Experience. Quality and Customer Service constitute customer experience. This has remained a priority for three years running. On the service front, our installer, distributor and module partners are our first line of association with our ultimate customer, the homeowner and business user. Our goals are to partner better with these service providers so that we can provide exceptional high quality service to our homeowner. We are convinced that continued reinforcement of customer experience improvements can be a competitive advantage for us.

Introduce New Products and Expand our Market. We are focused on residential solar in a dozen countries providing serviceable available market ('SAM') of approximately $3.3 billion in 2019. We also plan to introduce new products in 2020 which will take our SAM to $12.5 billion in 2022 which will comprise of residential solar, residential storage, small commercial solar and off-grid solar and storage.

Expand our Digital Presence. We are focused on generating revenue through digitalization of the business-to-business and business-to-customer process of the partner and customer journey. Future key focus is to expand our digital presence through enhancing our online store, increasing the use of the online store significantly, and releasing a comprehensive digital platform.

Components of Consolidated Statements of Operations

Net Revenues

We primarily generate net revenues from sales of our microinverter solutions and related accessories, which can include our AC Battery storage systems, our Envoy communications gateway and Enlighten cloud-based monitoring service as well as other accessories.

Our revenue is affected by changes in the volume and average selling prices of our solutions and related accessories, supply and demand, sales incentives, and competitive product offerings. Our revenue growth is dependent on our ability to compete effectively in the marketplace by remaining cost competitive, developing and introducing new products that meet the changing technology and performance requirements of our customers, the diversification and expansion of our revenue base, and our ability to market our products in a manner that increases awareness for microinverter technology and differentiates us in the marketplace.

Cost of Revenues and Gross Profit

Cost of revenues is comprised primarily of product costs, warranty, manufacturing personnel and logistics costs, freight costs, depreciation and amortization of test equipment and hosting services costs. Our product costs are impacted by technological innovations, such as advances in semiconductor integration and new product introductions, economies of scale resulting in lower component costs, and improvements in production processes and automation. Certain costs, primarily personnel and depreciation and amortization of test equipment, are not directly affected by sales volume.

We outsource our manufacturing to third-party contract manufacturers and generally negotiate product pricing with them on a quarterly basis. We believe our contract manufacturing partners have sufficient production capacity to meet the anticipated demand for our products for the foreseeable future. However, shortages in the supply of certain key raw materials could adversely affect our ability to meet customer demand for our products. We contract with third parties, including one of our contract manufacturers, to serve as our logistics providers by warehousing and delivering our products in the U.S., Europe and Asia.

Gross profit may vary from quarter to quarter and is primarily affected by our average selling prices, product cost, product mix, customer mix, warranty costs and sales volume fluctuations resulting from seasonality.

Operating Expenses

Operating expenses consist of research and development, sales and marketing, general and administrative and restructuring expenses. Personnel-related costs are the most significant component of each of these expense categories other than restructuring expense and include salaries, benefits, payroll taxes, sales commissions, incentive compensation and stock-based compensation.

Research and development expense include personnel-related expenses, third-party design and development costs, testing and evaluation costs, depreciation expense and other indirect costs. Research and development employees are primarily engaged in the design and development of power electronics, semiconductors, powerline communications, networking and software functionality, and storage. We devote substantial resources to research and development programs that focus on enhancements to, and cost efficiencies in, our existing products and timely development of new products that utilize technological innovation to drive down product costs, improve functionality, and enhance reliability. We intend to continue to invest appropriate resources in our research and development efforts because we believe they are critical to maintaining our competitive position.

Sales and marketing expense include personnel-related expenses, travel, trade shows, marketing, customer support and other indirect costs. We expect to continue to make the necessary investments to enable us to execute our strategy to increase our market penetration geographically and enter into new markets by expanding our customer base of distributors, large installers, OEMs and strategic partners. We currently offer solutions targeting the residential and commercial markets in the U.S., Canada, Mexico, Central American markets, Europe, Australia, New Zealand, India and certain other Asian markets. We expect to continue to expand the geographic reach of our product offerings and explore new sales channels in addressable markets in the future.

General and administrative expense include personnel-related expenses for our executive, finance, human resources, information technology and legal organizations, facilities costs, and fees for professional services. Fees for professional services consist primarily of outside legal, accounting and information technology consulting costs.

Restructuring charges are the net charges resulting from restructuring initiatives implemented in 2018-2019 (the "2018 Plan") to improve operational performance and reduce overall operating expenses. Under the 2018 Plan, costs included in restructuring primarily consisted of employee severance and one-time benefits, workforce reorganization charges, non-cash charges related to impairment of property and equipment, and the establishment of lease loss reserves. See Note 10. "Restructuring," of the notes to consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K for additional information.

Other Expense, Net

Other expense, net primarily consists of interest expense and fees under our convertible notes and term loans, and non-cash interest expense related to the accretion of debt discount and amortization of deferred financing costs. Other expense, net also includes interest income on our cash balance and gains or losses upon conversion of foreign currency transactions into U.S. dollars.

Income Tax (Provision) Benefit

We are subject to income taxes in the countries where we sell our products. Historically, we have primarily been subject to taxation in the U.S. because we have sold the majority of our products to customers in the U.S. As we have expanded the sale of products to customers outside the U.S., we have become subject to taxation based on the foreign statutory rates in the countries where these sales took place. As sales in foreign jurisdictions increase in the future, our effective tax rate may fluctuate accordingly. We regularly assess the ability to realize deferred tax assets based on the weight of all available evidence, including such factors as the history of recent earnings and expected future taxable income on a jurisdiction by jurisdiction basis. During the fourth quarter of fiscal year 2019, after considering these factors, we determined that the positive evidence overcame any negative evidence, primarily due to cumulative income in recent years, and the expectation of sustained profitability in future periods and concluded that it was more likely than not that the US federal and state deferred tax assets were realizable. As a result, we released the valuation allowance against all of the U.S. federal and state deferred tax assets during the fourth quarter of fiscal year 2019.

Summary Consolidated Statements of Operations

The following table sets forth a summary of our consolidated statements of operations for the periods presented (in thousands):

	Years Ended December 31,		
	2019	2018	2017
Net revenues	$ 624,333	$ 316,159	$ 286,166
Cost of revenues	403,088	221,714	230,123
Gross profit	221,245	94,445	56,043
Operating expenses:			
Research and development	40,381	32,587	33,157
Sales and marketing	36,728	27,047	23,126
General and administrative	38,808	29,086	22,221
Restructuring charges	2,599	4,129	16,917
Total operating expenses	118,516	92,849	95,421
Income (loss) from operations	102,729	1,596	(39,378)
Other expense, net			
Interest income	2,513	1,058	276
Interest expense	(9,691)	(10,693)	(8,212)
Other (expense) income, net	(5,437)	(2,190)	1,973
Total other expense, net	(12,615)	(11,825)	(5,963)
Income (loss) before income taxes	90,114	(10,229)	(45,341)
Income tax benefit (provision)	71,034	(1,398)	149
Net income (loss)	$ 161,148	$ (11,627)	$ (45,192)

Results of Operations

In this section, we discuss the results of our operations for the year ended December 31, 2019 compared to the year ended December 31, 2018. For a discussion of the year ended December 31, 2018 compared to the year ended December 31, 2017, please refer to Part II, Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations" in our Annual Report on Form 10-K for the year ended December 31, 2018.

Net Revenues

	Years Ended December 31,		Change in	
	2019	2018	$	%
	(In thousands, except percentages)			
Net revenues	$ 624,333	$ 316,159	$ 308,174	97 %

Net revenues increased by 97% in 2019, as compared to 2018, due primarily to an increase in the number of units shipped as well as increase in the average selling price per microinverter unit. We sold 6.2 million microinverter units in 2019, as compared to 2.8 million units in 2018. The increase in average selling price per microinverter was due to the better product mix and customer mix yielding 98% of our shipment being from IQ7 series microinverter coupled with improved pricing management. See Note 3. "Revenue Recognition," of the notes to consolidated financial statements.

Cost of Revenues and Gross Margin

	Years Ended December 31,		Change in	
	2019	2018	$	%
	(In thousands, except percentages)			
Cost of revenues	$ 403,088	$ 221,714	$ 181,374	82 %
Gross profit	221,245	94,445	126,800	134 %
Gross margin	35.4%	29.9%		

Cost of revenues increased by 82% in 2019, as compared to 2018, primarily due to higher volume of microinverter units sold and expedited freight costs, partially offset by a decrease in the unit cost of our products as a result of our cost reduction efforts. Gross margin increased by 5.5 percentage points for the year ended December 31, 2019, as compared to the same period in 2018. The increase in gross margin was primarily attributable to higher product margins as a result our IQ 7 family of microinverters, which has a unit lower cost than previous models of microinverters, as well as our overall pricing and cost management efforts. IQ 7 sales represented 98% of our total microinverter sales for the year ended December 31, 2019, as compared to 50% of our total microinverter sales in in the same period in 2018.

Research and Development

	Years Ended December 31,		Change in	
	2019	2018	$	%
	(In thousands, except percentages)			
Research and development	$ 40,381	$ 32,587	$ 7,794	24 %
Percentage of net revenues	6%	10%		

Research and development expense increased by $7.8 million in 2019, as compared to 2018. The increase is due to $6.0 million of higher personnel-related expenses and $1.4 million of outside consulting services associated with the development, introduction and qualification of new products. The increase in personnel-related expenses was primarily due to hiring employees in New Zealand, India and US, increasing total compensation costs, including stock-based compensation and travel expenditures. The amount of research and development expenses may fluctuate from period to period due to the differing levels and stages of development activity.

Sales and Marketing

	Years Ended December 31,		Change in	
	2019	2018	$	%
	(In thousands, except percentages)			
Sales and marketing	$ 36,728	$ 27,047	$ 9,681	36 %
Percentage of net revenues	6%	9%		

Sales and marketing expense increased by $9.7 million in 2019, as compared to 2018. The increase was primarily due to $8.1 million of higher personnel related expenses as result of our efforts to improve customer experience by hiring additional employees to reduce the average wait time, $1.3 million of higher amortization of developed technology, patents and licensed technology acquired from SunPower in August 2018, as well as other professional services and business activities to increase business growth. The increase in personnel-related expenses included higher employee compensation, including stock-based compensation, bonus and sales commissions, as well as higher travel expenses associated with increased headcount.

General and Administrative

	Years Ended December 31,		Change in	
	2019	2018	$	%
	(In thousands, except percentages)			
General and administrative	$ 38,808	$ 29,086	$ 9,722	33 %
Percentage of net revenues	6%	9%		

General and administrative expense increased by $9.7 million in 2019, as compared to 2018. The increase was primarily due to $7.8 million increase in personnel-related expenses due to higher headcount in India and U.S., $1.0 million increase in professional advisory fees primarily due to our first year of being subject to auditor attestation requirements under the Sarbanes-Oxley Act of 2002 in connection with our 2018 financial statements audit, $1.4 million increase in legal fees as well as $0.9 million increase in facilities costs as a result of our business growth. The increase was partially offset by $1.8 million paid to resolve a dispute with a supplier and acquisition-related costs of $0.8 million in 2018 that did not recur in 2019. The increase in personnel-related expenses was primarily attributable to higher stock-based compensation expense, salary and bonus compensation, as well as higher spending for contractors.

Restructuring Charges

	Years Ended December 31,		Change in	
	2019	2018	$	%
	(In thousands, except percentages)			
Restructuring charges	$ 2,599	$ 4,129	$ (1,530)	(37)%
Percentage of net revenues	0.4%	1%		

We implemented a restructuring plan in the third quarter of 2018 to lower our operating expenses. This plan included a realignment of our global workforce to lower cost locations and a relocation of our corporate headquarters. Although we will continue to make business and process improvements, our formal restructuring efforts were completed in 2019, and we do not expect to incur substantial restructuring charges in the near-term under this restructuring plan.

Restructuring charges for 2019 primarily included $1.6 million in cash-based severance and related benefits and $1.1 million in non-cash charges for impaired assets, partially offset by $0.1 million for lease loss reserves due to adoption of ASC 842, Leases. Restructuring charges for 2018 primarily included $2.2 million in cash-based severance and related benefits, $1.6 million in charges for impaired assets, and $0.3 million for lease loss reserves.

Other Income (Expense), Net

	Years Ended December 31,		Change in	
	2019	2018	$	%
	(In thousands, except percentages)			
Interest income	$ 2,513	$ 1,058	$ 1,455	138 %
Interest expense	(9,691)	(10,693)	1,002	(9)%
Other (expense) income, net	(5,437)	(2,190)	(3,247)	148 %
Total other expense, net	$ (12,615)	$ (11,825)	$ (790)	7 %

Interest income of $2.5 million for the year ended December 31, 2019 increased, as compared to $1.1 million for the year ended December 31, 2018, primarily due to interest earned on a higher average cash balance.

Interest expense of $9.7 million for the year ended December 31, 2019 primarily includes $4.6 million related to the coupon interest incurred, debt discount and amortization of debt issuance costs with our Notes due 2024, interest expense of $2.7 million related to the repayment of our term loan, interest expense of $1.5 million related to coupon interest incurred and amortization of debt issuance costs associated with Notes due 2023, and $0.9 million of interest expense related to long-term financing receivable recorded as debt. Interest expense of $10.7 million for the year ended December 31, 2018 primarily includes interest expense related to our Term Loans and coupon interest incurred and amortization of debt issuance costs associated with Notes due 2023.

Other income (expense), net, of $5.4 million for the year ended December 31, 2019 primarily relates to the $6.0 million fees paid for the repurchase and exchange of our Notes due 2023, partially offset by $0.6 million net gain related to foreign currency exchange and remeasurement. Other income (expense), net of $2.2 million for the year ended December 31, 2018 includes $2.5 million loss due to foreign currency exchange and remeasurement, partially offset by a $0.4 million of valuation adjustments on our term loan.

Income Tax (Provision) Benefit

	Years Ended December 31,		Change in	
	2019	2018	$	%
	(In thousands, except percentages)			
Income tax benefit (provision)	$ 71,034	$ (1,398)	$ 72,432	**
Effective tax rate	78.83%	(13.67)%		

** Not meaningful

The income tax benefit of $71.0 million for the year ended December 31, 2019 increased compared to the income tax provision of $1.4 million in 2018, was primarily due to release of valuation allowance, partially offset by increased foreign income taxes. See Note 15. “Income Taxes,” of the notes to consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K for additional information.

Liquidity and Capital Resources

Sources of Liquidity

As of December 31, 2019, we had $251.4 million in cash and cash equivalents, $44.7 million in restricted cash and working capital of $300.3 million. Cash, cash equivalents and restricted cash held in the U.S. were $289.8 million and consisted primarily of U.S. government money market mutual funds and both interest-bearing and non-interest-bearing deposits, with the remainder held in various foreign subsidiaries. Restricted cash represents cash held by us in the form of a certificate of deposit collateralized under a letter of credit we issued to a customer. We consider amounts held outside the U.S. to be accessible and have provided for the estimated U.S. income tax liability associated with our foreign earnings.

Term Loans

On January 28, 2019, we repaid in full the remaining principal amount of the Term Loans of approximately $39.5 million plus accrued interest and fees owed to lenders affiliated with Tennenbaum Capital Partners, LLC.

Convertible Notes

Notes due 2023. In August 2018, we issued $65.0 million aggregate principal amount of convertible senior notes in a private placement ("Notes due 2023"). The Notes due 2023 are general unsecured obligations and bear interest at a rate of 4.0% per year, payable semi-annually on February 1 and August 1 of each year, beginning on February 1, 2019. The Notes due 2023 will mature on August 1, 2023, unless earlier repurchased by us or converted at the option of the holders. On May 30, 2019, we entered into separately and privately negotiated transactions with certain holders of the Notes due 2023 resulting in the repurchase and exchange, as of June 5, 2019, of $60.0 million aggregate principal amount of the notes in consideration for the issuance of 10,801,080 shares of common stock and separate cash payments totaling $6.0 million. As of December 31, 2019, we had $5.0 million aggregate principal amount of our Notes due 2023 outstanding.

Notes due 2024. In June 2019, we issued $132.0 million aggregate principal amount of convertible senior notes in a private placement ("Notes due 2024"). The Notes due 2024 are general unsecured obligations and bear interest at a rate of 1.0% per year, payable semi-annually on June 1 and December 1 of each year, beginning on December 1, 2019. The Notes due 2024 will mature on June 1, 2024, unless earlier repurchased by us or converted at the option of the holders at a conversion price of $20.50 per share. As of December 31, 2019, we had $132.0 million aggregate principal amount of our Notes due 2024 outstanding.

The Notes due 2024 may be converted on any day prior to the close of business on the business day immediately preceding December 1, 2023, in multiples of $1,000 principal amount, at the option of the holder under any of the following circumstances: (1) during any calendar quarter commencing after the calendar quarter ending on September 30, 2019 (and only during such calendar quarter), if the last reported sale price of the our common stock for at least 20 trading days (whether or not consecutive) during a period of 30 consecutive trading days ending on, and including, the last trading day of the immediately preceding calendar quarter is greater than or equal to $26.6513 (130% of the conversion price) on each applicable trading day; (2) during the five business day period after any five consecutive trading day period (the "measurement period") in which the "trading price" (as defined in the relevant indenture) per $1,000 principal amount of notes for each trading day of the measurement period was less than 98% of the product of the last reported sale price of the our common stock and the conversion rate on each such trading day; or (3) upon the occurrence of specified corporate events. Upon conversion of any of the notes, we will pay or deliver, as the case may be, cash, shares of common stock or a combination of cash and common stock, at our election.

In connection with the offering of the Notes due 2024, we entered into privately-negotiated convertible note hedge transactions in order to reduce the potential dilution to our common stock upon any conversion of the Notes due 2024. The total cost of the convertible note hedge transactions was approximately $36.3 million. Also, concurrently with the offering of the Notes due 2024, we entered into privately-negotiated warrant transactions whereby we issued warrants to acquire shares of our common stock at a strike price of $25.2320 rather than the Notes due 2024 conversion price of $20.5010. We received approximately $29.8 million from the sale of the warrants.

As of February 21, 2020, the Notes due 2024 were not converted into equity, therefore, we had not purchased any shares under the convertible note hedge and the warrants had not been exercised and remain outstanding. If holders of the Notes due 2024 are able to convert the debt to equity, and exercise that right, we have asserted our intent and ability to settle the $132.0 million aggregate principal amount of the Notes due 2024 in cash. See Note 11, "Debt," of the notes to consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K for more information relating to the convertible note hedge transactions and warrants.

We believe that our existing cash and cash equivalents and cash flows from our operating activities will be sufficient to meet our anticipated cash needs for at least the next 12 months.

Cash Flows. The following table summarizes our cash flows for the periods presented:

	Years Ended December 31,		
	2019	2018	2017
	(In thousands)		
Net cash provided by (used in) operating activities	$ 139,067	$ 16,132	$ (28,442)
Net cash used in investing activities	(14,788)	(19,151)	(4,121)
Net cash provided by financing activities	65,850	80,614	43,297
Effect of exchange rate changes on cash	(257)	(502)	646
Net increase in cash, cash equivalents and restricted cash	$ 189,872	$ 77,093	$ 11,380

Cash Flows from Operating Activities

For the year ended December 31, 2019, net cash provided by operating activities was $139.1 million compared to net cash provided by operating activities of $16.1 million in 2018, an increase of $122.9 million year-over-year. The $122.9 million increase in net cash provided by operating activities in 2019 compared to 2018, was primarily due to higher profitability in 2019 of $172.8 million higher net income, partially offset by higher net non-cash benefit of $49.7 million. The higher net non-cash benefit of $49.7 million in 2019, compared to 2018, is comprised of $73.4 million higher deferred income tax benefit due to the release of the valuation allowance against our deferred tax assets, $0.5 million lower provision for doubtful accounts and $0.5 million lower asset impairment, partially offset by higher non-cash charges for $8.7 million higher stock-based compensation, $6.0 million fees paid for repurchase and exchange of convertible notes due 2023, $2.2 million financing fees on extinguishment of Term Loans, $4.5 million higher depreciation on property and equipment and $3.4 million higher non-cash interest expense primarily due to debt discount on Notes due 2024. The changes in the working capital year-over-year was neutral as our growth in deferred revenue of $78.4 million, including $49.9 million of safe harbor prepayments, was offset by our growth in accounts receivable of $55.2 million and inventory of $25.5 million in 2019, compared to 2018.

Cash Flows from Investing Activities

For the year ended December 31, 2019, net cash used in investing activities was $14.8 million, primarily from purchases of test and assembly equipment to expand our supply capacity and related facility improvements, and capitalized costs related to internal-use software. For the year ended December 31, 2019, purchases of property and equipment totaled $14.8 million, compared to purchases in 2018 of $4.2 million, an increase in purchases of $10.6 million year-over-year. For the year ended December 31, 2018, cash used in investing activities included $15.0 million payment related to the acquisition of SunPower's microinverter business. In 2019, we did not acquire any businesses.

Cash Flows from Financing Activities

For the year ended December 31, 2019, net cash provided by financing activities of $65.9 million was primarily from $127.4 million net proceeds from the issuance of our Notes due 2024, $29.8 million from sale of warrants, $5.0 million net proceeds from employee stock option exercises and issuance of common stock under our employee stock incentive program, partially offset by $45.9 million repayment of our term loan and long-term financing receivable recorded as debt, $36.3 million purchase of bond hedges related to our Notes due 2024, $6.0 million fee paid to repurchase and exchange $60.0 million of Notes due 2023 and $8.2 million payment of employee withholding taxes related to net share settlement of equity awards. For the year ended December 31, 2018, net cash provided by financing activities of $80.6 million was primarily from net proceeds of $62.4 million received from issuance of convertible debt, $19.8 million in net proceeds from sales of common stock, $5.6 million in net proceeds from the sale of certain long-term financing receivables and $2.8 million net proceeds from issuance of common stock under our employee stock incentive program, partially offset by $10.0 million in debt payments.

Contractual Obligations

The following table summarizes our outstanding contractual obligations as of December 31, 2019.

	Payments Due by Period				
	Total	2020	2021-2022	2023-2024	Beyond 2024
			(In thousands)		
Operating leases	$ 15,170	$ 4,156	$ 7,165	$ 3,109	$ 740
Notes due 2023 principal and interest	5,800	200	400	5,200	—
Notes due 2024 principal and interest	137,958	1,320	2,640	133,998	—
Purchase obligations [(1)]	99,520	99,520	—	—	—
Total	$ 258,448	$ 105,196	$ 10,205	$ 142,307	$ 740

(1) Purchase obligations include amounts related to component inventory that our primary contract manufacturer procures on our behalf in accordance with our production forecast as well as other inventory related purchase commitments. The timing of purchases in future periods could differ materially from estimates presented above due to fluctuations in demand requirements related to varying sales levels as well as changes in economic conditions.

Off-Balance Sheet Arrangements

As of December 31, 2019, we did not have any off-balance sheet arrangements, as defined in Item 303(a)(4)(ii) of SEC Regulation S-K.

Critical Accounting Policies

The preparation of our consolidated financial statements and related notes requires us to make judgments, estimates and assumptions that affect the reported amounts of assets, liabilities, revenue and expenses, and related disclosure of contingent assets and liabilities. We have based our estimates 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.

For a description of our significant accounting policies, see Note 2. "Summary of Significant Accounting Policies," of the notes to consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K. An accounting policy is considered to be critical if it requires an accounting estimate to be made based on assumptions about matters that are highly uncertain at the time the estimate is made, and if different estimates that reasonably could have been used, or changes in the accounting estimates that are reasonably likely to occur periodically, could materially impact the consolidated financial statements. We believe the following critical accounting policies reflect the more significant estimates and assumptions used in the preparation of our consolidated financial statements.

Revenue Recognition

We generate revenue from sales of our solutions, which include microinverter units and related accessories, an Envoy communications gateway, the cloud-based Enlighten monitoring service, and AC Battery storage solutions to distributors, large installers, OEMs and strategic partners.

On January 1, 2018, we adopted Accounting Standards Codification ("ASC") No. 606, "Revenue Recognition" ("ASC 606" or "Topic 606") and applied the modified retrospective method to all contracts that were not completed as of January 1, 2018. The most significant impacts upon adoption of Topic 606 were how we account for revenue related to our Envoy communications device and related Enlighten service and the timing of when certain sales incentives are recognized. The full consideration for these products represents a single performance obligation and is deferred and recognized over the estimated service period.

Revenues are recognized when control of the promised goods or services are transferred to our customers in an amount that reflects the consideration that is expected to be received in exchange for those goods or services. We generate all of our revenues from contracts with our customers. A description of principal activities from which we generate revenues are as follows.

- *Products Delivered at a Point in Time.* We sell our products to customers in accordance with the terms of the related customer contracts. We generate revenues from sales of our solutions, which include microinverter units and related accessories, an Envoy communications gateway and Enlighten service, communications accessories and AC Battery storage solutions to distributors, large installers, OEMs and strategic partners. Microinverter units, microinverter accessories, and AC Battery storage solutions are delivered to customers at a point in time, and we recognize revenue for these products when we transfer control of the product to the customer, which is generally upon shipment.
- *Products Delivered Over Time.* The sale of an Envoy communications gateway includes our Enlighten cloud-based monitoring service. The full consideration for these products represents a single performance obligation and is deferred at the sale date and recognized over the estimated service period of 6 years. We also sell certain communication accessories that are delivered over time. The revenue from these products is recognized over the related service period, which is typically 5 or 12 years.

We previously sold Envoy communications device to certain customers under a long-term financing arrangement. Under this financing arrangement, we net the unbilled receivables against deferred revenue.

We record certain contra revenue promotions as variable consideration and recognizes these promotions at the time the related revenue is recorded.

We record upfront contract acquisition costs, such as sales commissions, to be capitalized and amortized over the estimated life of the asset. For contracts that have a duration of less than one year, we follow the Topic 606 practical expedient and expense these costs when incurred. Commissions related to our sale of monitoring hardware and service are capitalized and amortized over the period of the associated revenue.

See Note 3. "Revenue Recognition," of the notes to consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K for additional information related to revenue recognition.

Inventory

Inventory is valued at the lower of cost or market. Market is current replacement cost (by purchase or by reproduction, dependent on the type of inventory). In cases where market exceeds net realizable value (*i.e.*, estimated selling price less reasonably predictable costs of completion and disposal), inventories are stated at net realizable value. Market is not considered to be less than net realizable value reduced by an allowance for an approximately normal profit margin. We determine cost on a first-in first-out basis. Certain factors could affect the realizable value of its inventory, including customer demand and market conditions. Management assesses the valuation on a quarterly basis and writes down the value for any excess and obsolete inventory based upon expected demand, anticipated sales price, effect of new product introductions, product obsolescence, customer concentrations, product merchantability and other factors. Inventory write-downs are equal to the difference between the cost of inventories and market. The impact of changes in the inventory valuation allowance for 2019, 2018 and 2017 were not material.

Warranty Obligations

Microinverters Sold Through December 31, 2013

Our warranty accrual provides for the replacement of microinverter units that fail during the product's warranty term (15 years for first and second generation microinverters and up to 25 years for third and fourth generation microinverters). On a quarterly basis, we employ a consistent, systematic and rational methodology to assess the adequacy of our warranty liability. This assessment includes updating all key estimates and assumptions for each generation of product, based on historical results, trends and the most current data available as of the filing date. The key estimates and assumptions used in the warranty liability are thoroughly reviewed by management on a quarterly basis. The key estimates used by us to estimate our warranty liability are: (1) the number of units expected to fail over time (*i.e.,* failure rate); (2) the number of failed units expected to result in warranty claims over time (*i.e.,* claim rate); and (3) the per unit cost of replacement units, including outbound shipping and limited labor costs, expected to be incurred to replace failed units over time (*i.e.,* replacement cost).

Estimated Failure Rates — Our Quality and Reliability department has primary responsibility to determine the estimated failure rates for each generation of microinverter. To establish initial failure rate estimates for each generation of microinverter, our quality engineers use a combination of industry standard Mean Time Between Failure ("MTFB") estimates for individual components contained in that generation of microinverters, third party data collected on similar equipment deployed in outdoor environments similar to those in which our microinverters are installed, and rigorous long term reliability and accelerated life cycle testing which simulates the service life of the microinverter in a short period of time. As units are deployed into operating environments, we continue to monitor product performance through our Enlighten monitoring platform. It typically takes three to nine months between the date of sale and date of end-user installation. Consequently, our ability to monitor actual failures of units sold similarly lags by three to nine months. When a microinverter fails and is returned, we perform diagnostic root cause failure analysis to understand and isolate the underlying mechanism(s) causing the failure. We then use the results of this analysis (combined with the actual, cumulative performance data collected on those units prior to failure through Enlighten) to draw conclusions with respect to how or if the identified failure mechanism(s) will impact the remaining units deployed in the installed base.

Estimated Claim Rates — Warranty claim rate estimates are based upon observed historical trends and assumptions with respect to expected customer behavior over the warranty period. As the vast majority of our microinverters have been sold to end users for residential applications, we believe that warranty claim rates will be affected by changes over time in residential home ownership because we expect that subsequent homeowners are less likely to file claims than the homeowners who originally purchase the microinverters.

Estimated Replacement Costs — Three factors are considered in our analysis of estimated replacement cost: (1) the estimated cost of replacement microinverters; (2) the estimated cost to ship replacement microinverters to end users; and (3) the estimated labor reimbursement expected to be paid to third party installers performing replacement services for the end user. Because our warranty provides for the replacement of defective microinverters over long periods of time (typically between 15 and 25 years, depending on the generation of product purchased), the estimated per unit cost of current and future product generations is considered in the estimated replacement cost. Estimated costs to ship replacement units are based on observable, market-based shipping costs paid by us to third party freight carriers. We have a separate program that allows third-party installers to claim fixed-dollar reimbursements for labor costs they incur to replace failed microinverter units for a limited time from the date of original installation. Included in our estimated replacement cost is an analysis of the number of fixed-dollar labor reimbursements expected to be claimed by third party installers over the limited offering period.

In addition to the key estimates noted above, we also compare actual warranty results to expected results and evaluate any significant differences. We may make additional adjustments to the warranty provision based on performance trends or other qualitative factors. If actual failure rates, claim rates, or replacement costs differ from our estimates in future periods, changes to these estimates may be required, resulting in increases or decreases in our warranty obligations. Such increases or decreases could be material.

Fair Value Option for Microinverters Sold Since January 1, 2014

Our warranty obligations related to microinverters sold since January 1, 2014 provide us the right, but not the requirement, to assign our warranty obligations to a third-party. Under ASC 825, "Financial Instruments" (also referred to as the "fair value option"), an entity may choose to elect the fair value option for such warranties at the time it first recognizes the eligible item. We made an irrevocable election to account for all eligible warranty obligations associated with microinverters sold since January 1, 2014 at fair value. This election was made to reflect the underlying economics of the time value of money for an obligation that will be settled over an extended period of up to 25 years.

We estimate the fair value of warranty obligations by calculating the warranty obligations in the same manner as for sales prior to January 1, 2014 and applying an expected present value technique to that result. The expected present value technique, an income approach, converts future amounts into a single current discounted amount. In addition to the key estimates of failure rates, claim rates and replacement costs, we used certain inputs that are unobservable and significant to the overall fair value measurement. Such additional assumptions included compensation comprised of a profit element and risk premium required of a market participant to assume the obligation and a discount rate based on our credit-adjusted risk-free rate. See Note 9. "Fair Value Measurements," of the notes to consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K for additional information.

Business Combinations

Assets acquired and liabilities assumed as part of a business acquisition are generally recorded at their fair value at the date of acquisition. The excess of purchase price over the fair value of assets acquired and liabilities assumed is recorded as goodwill. Determining fair value of identifiable assets, particularly intangibles, and liabilities acquired also requires the Company to make estimates, which are based on all available information and in some cases assumptions with respect to the timing and amount of future revenues and expenses associated with an asset. Accounting for business acquisitions requires the Company to make judgments as to whether a purchase transaction is a multiple element contract, meaning that it includes other transaction components. This judgment and determination affect the amount of consideration paid that is allocable to assets and liabilities acquired in the business purchase transaction.

Intangible Assets

Intangible assets include patents and other purchased intangible assets. Intangible assets with finite lives are amortized on a straight-line basis, with estimated useful lives ranging from 3 to 9 years. Indefinite-lived intangible assets are tested for impairment annually and are also tested for impairment between annual tests if an event occurs or circumstances change that would indicate that the carrying amount may be impaired. Intangible assets with finite lives are tested for impairment whenever events or circumstances indicate that the carrying amount of an asset (asset group) may not be recoverable. An impairment loss is recognized when the carrying amount of an asset exceeds the estimated undiscounted cash flows used in determining the fair value of the asset. The amount of the impairment loss to be recorded is calculated by the excess of the asset's carrying value over its fair value. Fair value is generally determined using a discounted cash flow analysis. There was no impairment of intangible assets in any of the years presented.

Income Taxes

We record income taxes using the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected tax consequences of temporary differences between the tax bases of assets and liabilities for financial reporting purposes and amounts recognized for income tax purposes. In estimating future tax consequences, generally all expected future events other than enactments or changes in the tax law or rates are considered. Valuation allowances are provided when necessary to reduce deferred tax assets to the amount expected to be realized.

We assess the realizability of the deferred tax assets to determine release of valuation allowance as necessary. In the event we determine that it is more likely than not that we would be able to realize deferred tax assets in the future in excess of our net recorded amount, an adjustment to the valuation allowance for the deferred tax asset would increase income in the period such determination was made. Likewise, should it be determined that additional amounts of the net deferred tax asset will not be realized in the future, an adjustment to increase the deferred tax asset valuation allowance will be charged to income in the period such determination is made.

We operate in various tax jurisdictions and is subject to audit by various tax authorities. We follow accounting for uncertainty in income taxes which requires that the tax effects of a position be recognized only if it is "more likely than not" to be sustained based solely on its technical merits as of the reporting date. We consider many factors when evaluating and estimating its tax positions and tax benefits, which may require periodic adjustments and which may not accurately anticipate actual outcomes.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

Foreign Currency Exchange Risk

We operate and conduct business in foreign countries where our foreign entities use the local currency as their respective functional currency and, as a result, are exposed to movements in foreign currency exchange rates. More specifically, we face foreign currency exposure primarily from the effect of fluctuating exchange rates on payables and receivables relating to transactions that are denominated in Euros, Indian Rupee and Australian and New Zealand Dollars. These payables and receivables primarily arise from sales to customers and intercompany transactions. We also face currency exposure that arises from translating the results of our European, Indian, Australian and New Zealand operations, including sales and marketing and research and development expenses, to the U.S. dollar at exchange rates that have fluctuated from the beginning of a reporting period.

We do not enter into derivative financial instruments for trading or speculative purposes. We did not enter into any foreign currency forward contracts during 2019 and 2018. Any foreign currency forward contracts entered in the future are accounted for as derivatives whereby the fair value of the contracts is reported as other current assets or current liabilities, and gains and losses resulting from changes in the fair value are reported in other income (expense), net, in the accompanying consolidated statements of operations.

Credit Risk

Financial instruments that subject us to concentrations of credit risk consist primarily of cash and cash equivalents and accounts receivable. We maintain a substantial portion of our cash balances in non-interest-bearing and interest-bearing deposits and money market accounts. We believe that these financial institutions are financially sound and, accordingly, are subject to minimal credit risk. Our net revenues are primarily concentrated among a limited number of customers. We monitor the financial condition of our customers and perform credit evaluations whenever considered necessary. We maintain an allowance for doubtful accounts for estimated potential credit losses. See Note 16 for information on Concentration of “Credit Risk and Major Customers” of the notes to consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K.

Interest Rate Risk

We had cash, cash equivalents and restricted cash of $296.1 million and $106.2 million as of December 31, 2019 and 2018, respectively, consisting of both non-interest bearing and interest-bearing deposits, and money market accounts. Such interest-earning instruments carry a degree of interest rate risk, but the risk is limited due to the duration of our short term investments. To date, fluctuations in interest income have not been significant. We do not enter into investments for trading or speculative purposes and have not used any derivative financial instruments to manage our interest rate risk exposure. We have not been exposed to, nor do we anticipate being exposed to, material risks due to changes in interest rates.

Our cash flow exposure due to changes in interest rates related to our debt is limited as our Notes due 2024 and Notes due 2023 have fixed interest rates of 1.0% and 4.0%, respectively. The fair value of the Convertible Notes may increase or decrease for various reasons, including fluctuations in the market price of our common stock, fluctuations in market interest rates and fluctuations in general economic conditions. Based upon the quoted market price as of December 31, 2019, the fair value of our Notes due 2024 was approximately $190.9 million. Notes due 2023 are not actively traded.

Item 8. Financial Statements and Supplementary Data

ENPHASE ENERGY, INC.

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

AS OF DECEMBER 31, 2019 AND 2018,

AND FOR THE YEARS ENDED DECEMBER 31, 2019, 2018 AND 2017

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of Enphase Energy, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Enphase Energy, Inc. and subsidiaries (the "Company") as of December 31, 2019 and 2018, the related consolidated statements of operations, comprehensive loss, stockholders' equity (deficit), and cash flows, for each of the three years in the period ended December 31, 2019, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019, in conformity with accounting principles generally accepted in the United States of America.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in Internal Control — Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated February 21, 2020, expressed an unqualified opinion on the Company's internal control over financial reporting.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the 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 financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

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.

Warranty Obligations – Microinverters - Refer to Notes 2, 8 and 9 to the consolidated financial statements

Critical Audit Matter Description

The Company's warranty obligation provides for the replacement of microinverter units that fail during the product's warranty term of 15 to 25 years. The estimated warranty liability is developed for each generation of product and requires management to estimate, among other factors, (1) the number of units expected to fail over time (i.e., failure rate); (2) the number of failed units expected to result in warranty claims over time (i.e., claim rate); and (3) the per unit cost of replacement units (i.e., replacement cost), all of which consider historical results, trends and the most current data available when the financial statements are available to be issued. The Company's warranty liability for all microinverter units sold after January 1, 2014 is measured at fair value by applying both of the following to the liability that results from the 3 factors discussed above: (1) compensation comprised of a profit element and risk premium required for a market participant to assume the obligation and (2) a discount rate based on the Company's credit adjusted risk free rate.

Given the limited operating history of the products relative to the warranty term and the subjectivity of estimating the projected failure rates of reported and unreported warranty claims, performing audit procedures to evaluate whether the expected failure rates were appropriately determined as of December 31, 2019, required a high degree of auditor judgment and an increased extent of effort.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the estimated failure rates used in determining the warranty obligation included the following, among others:

- We tested the effectiveness of controls utilized in the review of the warranty obligation calculation, including controls over the determination of estimated failure rates.
- We evaluated the methods and assumptions used by management to estimate the failure rates used as part of the calculation of the warranty obligation by:
  - Testing the underlying data that served as the basis for the Company's failure rate analysis, which include historical claims and historical product sales, in order to evaluate the various assumptions and historical data consisting of failure of individual components contained in its microinverters.
  - Reviewing third party data compiled on similar products in order to challenge management's assumptions and identify supporting or contradictory evidence.
  - Comparing management's prior-year assumptions of expected failures to actual warranty claims received during the current year to identify potential bias in the determination of the failure rate estimates used in the warranty obligation recorded.
  - Developing independent estimates of the future failure rates for product families by utilizing data analytics and compared them to management assumptions.

Income Taxes - Valuation Allowance – Refer to Notes 2 and 15 to the consolidated financial statements

Critical Audit Matter Description

The Company recognizes deferred income taxes for differences between the financial statement and tax bases of assets and liabilities at enacted statutory tax rates in effect for the years in which the differences are expected to reverse. Valuation allowances are provided to reduce deferred tax assets to the amount that is more likely than not to be realized. In determining the need for a valuation allowance, management considers, among other matters, the nature, frequency and amount of recent losses, the duration of statutory carryforward periods, and tax planning strategies and the weight given to positive and negative evidence is commensurate with the extent to which the evidence may be objectively verified. As of December 31, 2019, the Company determined that it was more-likely-than not that its domestic deferred tax assets would be realized. The factors that the Company weighted most heavily in their analysis were a history of income and projected future taxable income. Therefore, the Company recorded an income tax benefit of $92.9 million for the year-ended December 31, 2019 associated with a reduction in the valuation allowance.

Given the determination that it is more likely than not that sufficient taxable income will be generated in the future to realize deferred tax assets requires management to make significant judgments and estimates related to projected future taxable income. Performing audit procedures to evaluate the reasonableness of management's estimates of projected future taxable income required a high degree of auditor judgment and an increased extent of effort, including the need to involve our income tax specialists.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to positive and negative evidence surrounding managements projected future taxable income and the determination of whether it is more likely than not that the Company would have U.S. income sufficient to realize the benefit of its deferred tax assets included the following, among others:

- We tested the effectiveness of controls over deferred tax assets, including management's controls over the estimates of projected future taxable income and the determination of whether it is more likely than not that the deferred tax assets will be realized.
- We evaluated the reasonableness of the methods, assumptions, and judgments used by management to determine whether a valuation allowance was necessary.

- With the assistance of our income tax specialists, we evaluated the nature of each of the deferred tax assets, including their expiration dates and their projected utilization when compared to projections of future taxable income.
- We tested historical pretax book income at December 31, 2019, adjusted for permanent differences, including the change from a 3-year cumulative loss position to a 3-year cumulative income position that occurred in the fourth quarter of 2019.
- We evaluated management's ability to accurately estimate projected future taxable income by comparing actual results to management's historical estimates and evaluating whether there have been any changes that would affect management's ability to continue accurately estimating taxable income.
- We tested the reasonableness of management's estimates of projected future taxable income by comparing the estimates to internal communications to management and the Board of Directors, and historical taxable income, as adjusted for nonrecurring items.

/s/ DELOITTE & TOUCHE LLP

San Francisco, California
February 21, 2020

We have served as the Company's auditor since 2010.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of Enphase Energy, Inc.

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of Enphase Energy, Inc. and subsidiaries (the "Company") as of December 31, 2019, based on criteria established in Internal Control — Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on criteria established in Internal Control — Integrated Framework (2013) issued by COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements as of and for the year ended December 31, 2019, of the Company and our report dated February 21, 2020 expressed an unqualified opinion on those financial statements.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process 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. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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.

/s/ DELOITTE & TOUCHE LLP

San Francisco, California
February 21, 2020

ENPHASE ENERGY, INC.
CONSOLIDATED BALANCE SHEETS
(In thousands, except par value)

	As of	
	December 31, 2019	December 31, 2018
ASSETS		
Current assets:		
Cash and cash equivalents	$ 251,409	$ 106,237
Restricted cash	44,700	—
Accounts receivable, net of allowances of $564 and $2,138 at December 31, 2019 and December 31, 2018, respectively	145,413	78,938
Inventory	32,056	16,267
Prepaid expenses and other assets	26,079	20,860
Total current assets	499,657	222,302
Property and equipment, net	28,936	20,998
Operating lease, right of use asset	10,117	—
Intangible assets, net	30,579	35,306
Goodwill	24,783	24,783
Other assets	44,620	36,548
Deferred tax assets, net	74,531	—
Total assets	$ 713,223	$ 339,937
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 57,474	$ 48,794
Accrued liabilities	47,092	29,010
Deferred revenues, current	81,783	33,119
Warranty obligations, current (includes $6,794 and $4,288 measured at fair value at December 31, 2019 and December 31, 2018, respectively)	10,078	8,083
Debt, current	2,884	28,155
Total current liabilities	199,311	147,161
Long-term liabilities:		
Deferred revenues, noncurrent	100,204	76,911
Warranty obligations, noncurrent (includes $13,012 and $7,469 measured at fair value at December 31, 2019 and December 31, 2018, respectively)	27,020	23,211
Other liabilities	11,817	3,250
Debt, noncurrent	102,659	81,628
Total liabilities	441,011	332,161
Commitments and contingent liabilities (Note 12)		
Stockholders' equity:		
Common stock, $0.00001 par value, 150,000 shares and 150,000 shares authorized; and 123,109 shares and 107,035 shares issued and outstanding at December 31, 2019 and December 31, 2018, respectively	1	1
Additional paid-in capital	458,315	353,335
Accumulated deficit	(185,181)	(346,302)
Accumulated other comprehensive income (loss)	(923)	742
Total stockholders' equity	272,212	7,776
Total liabilities and stockholders' equity	$ 713,223	$ 339,937

See Notes to Consolidated Financial Statements.

ENPHASE ENERGY, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS
(In thousands, except per share data)

	Years Ended December 31,		
	2019	2018	2017
Net revenues	$ 624,333	$ 316,159	$ 286,166
Cost of revenues	403,088	221,714	230,123
Gross profit	221,245	94,445	56,043
Operating expenses:			
Research and development	40,381	32,587	33,157
Sales and marketing	36,728	27,047	23,126
General and administrative	38,808	29,086	22,221
Restructuring charges	2,599	4,129	16,917
Total operating expenses	118,516	92,849	95,421
Income (loss) from operations	102,729	1,596	(39,378)
Other expense, net			
Interest income	2,513	1,058	276
Interest expense	(9,691)	(10,693)	(8,212)
Other (expense) income, net	(5,437)	(2,190)	1,973
Total other expense, net	(12,615)	(11,825)	(5,963)
Income (loss) before income taxes	90,114	(10,229)	(45,341)
Income tax benefit (provision)	71,034	(1,398)	149
Net income (loss)	$ 161,148	$ (11,627)	$ (45,192)
Net income (loss) per share:			
Basic	$ 1.38	$ (0.12)	$ (0.54)
Diluted	$ 1.23	$ (0.12)	$ (0.54)
Shares used in per share calculation:			
Basic	116,713	99,619	82,939
Diluted	131,644	99,619	82,939

See Notes to Consolidated Financial Statements.

ENPHASE ENERGY, INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)
(In thousands)

	Years Ended December 31,		
	2019	2018	2017
Net income (loss)	$ 161,148	$ (11,627)	$ (45,192)
Other comprehensive income (loss):			
Foreign currency translation adjustments	(1,665)	1,398	(364)
Comprehensive income (loss)	$ 159,483	$ (10,229)	$ (45,556)

See Notes to Consolidated Financial Statements.

ENPHASE ENERGY, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY (DEFICIT)
(In thousands)

	Common Stock		Additional Paid-In Capital	Accumulated Income (Deficit)	Accumulated Other Comprehensive Income (Loss)	Total Stockholders' Equity (Deficit)
	Shares	Amount				
Balance at December 31, 2016	62,269	$ 1	$ 252,126	$ (250,535)	$ (292)	$ 1,300
Issuance of common stock from exercise of equity awards and employee stock purchase plan	1,752	—	531	—	—	531
Issuance of common stock, net of offering costs	21,893	—	26,425	—	—	26,425
Issuance of warrants	—	—	1,447	—	—	1,447
Stock-based compensation	—	—	6,727	—	—	6,727
Net loss	—	—	—	(45,192)	—	(45,192)
Foreign currency translation adjustment	—	—	—	—	(364)	(364)
Balance at December 31, 2017	85,914	$ 1	$ 287,256	$ (295,727)	$ (656)	$ (9,126)
Cumulative-effect adjustment to accumulated deficit related to the adoption of ASC 606	—	—	—	(38,948)	—	(38,948)
Issuance of common stock from exercise of equity awards and employee stock purchase plan	3,185	—	2,806	—	—	2,806
Issuance of common stock, net of offering costs	9,524	—	19,766	—	—	19,766
Issuance of common stock related to acquisition	7,500	—	32,319	—	—	32,319
Exercise of warrants	912	—	—	—	—	—
Stock-based compensation	—	—	11,188	—	—	11,188
Net loss	—	—	—	(11,627)	—	(11,627)
Foreign currency translation adjustment	—	—	—	—	1,398	1,398
Balance at December 31, 2018	107,035	$ 1	$ 353,335	$ (346,302)	$ 742	$ 7,776
Cumulative-effect adjustment to accumulated deficit related to the adoption of ASU 2018-07	—	—	27	(27)	—	—
Issuance of common stock from exercise of equity awards and employee stock purchase plan	5,273	—	4,985	—	—	4,985
Payment of withholding taxes related to net share settlement of equity awards	—	—	(8,198)	—	—	(8,198)
Conversion of convertible notes due 2023, net	10,801	—	58,857	—	—	58,857
Equity component of convertible notes due 2024, net	—	—	35,387	—	—	35,387
Cost of convertible notes hedge related to the convertible notes due 2024	—	—	(36,313)	—	—	(36,313)
Sale of warrants related to the convertible notes due 2024	—	—	29,818	—	—	29,818
Stock-based compensation	—	—	20,417	—	—	20,417
Net income	—	—	—	161,148	—	161,148
Foreign currency translation adjustment	—	—	—	—	(1,665)	(1,665)
Balance at December 31, 2019	123,109	$ 1	$ 458,315	$ (185,181)	$ (923)	$ 272,212

See Notes to Consolidated Financial Statements.

ENPHASE ENERGY, INC.

CONSOLIDATED STATEMENTS OF CASH FLOWS

(In thousands)

	Years Ended December 31,		
	2019	**2018**	**2017**
Cash flows from operating activities:			
Net income (loss)	$ 161,148	$ (11,627)	$ (45,192)
Adjustments to reconcile net income (loss) to net cash provided by operating activities:			
Depreciation and amortization	14,119	9,667	9,004
Provision for doubtful accounts	217	711	476
Asset impairment	1,124	1,601	1,681
Non-cash interest expense	6,081	2,701	1,673
Financing fees on extinguishment of debt	2,152	—	—
Fees paid for repurchase and exchange of convertible notes due 2023	6,000	—	—
Stock-based compensation	20,176	11,432	6,727
Deferred income taxes	(73,375)	123	(1,394)
Changes in operating assets and liabilities:			
Accounts receivable	(68,745)	(13,515)	(4,803)
Inventory	(15,789)	9,732	5,961
Prepaid expenses and other assets	(14,293)	(3,130)	(1,227)
Intangible assets	—	(10,000)	—
Accounts payable, accrued and other liabilities	22,200	23,082	(5,078)
Warranty obligations	5,804	1,478	(1,598)
Deferred revenues	72,248	(6,123)	5,328
Net cash provided by (used in) operating activities	139,067	16,132	(28,442)
Cash flows from investing activities:			
Purchases of property and equipment	(14,788)	(4,151)	(4,121)
Acquisition	—	(15,000)	—
Net cash used in investing activities	(14,788)	(19,151)	(4,121)
Cash flows from financing activities:			
Issuance of convertible notes due 2024, net of issuance costs	127,413	—	—
Purchase of convertible note hedges	(36,313)	—	—
Sale of warrants	29,818	—	—
Fees paid for repurchase and exchange of convertible notes due 2023	(6,000)	—	—
Principal payments and financing fees on debt	(45,855)	(9,976)	—
Proceeds from issuance of common stock, net of issuance costs	—	19,766	26,425
Proceeds from debt, net of issuance costs	—	68,024	26,442
Payments under revolving credit facility	—	—	(10,100)
Proceeds from exercise of equity awards and employee stock purchase plan	4,985	2,800	530
Payment of withholding taxes related to net share settlement of equity awards	(8,198)	—	—
Net cash provided by financing activities	65,850	80,614	43,297
Effect of exchange rate changes on cash and cash equivalents	(257)	(502)	646
Net increase in cash, cash equivalents, and restricted cash	189,872	77,093	11,380
Cash, cash equivalents and restricted cash—Beginning of period	106,237	29,144	17,764
Cash, cash equivalents and restricted cash—End of period	$ 296,109	$ 106,237	$ 29,144

	Years Ended December 31,		
	2019	2018	2017
Reconciliation of cash, cash equivalents, and restricted cash to the consolidated balance sheets			
Cash and cash equivalents	251,409	106,237	29,144
Restricted cash	44,700	—	—
Total cash, cash equivalents, and restricted cash	$ 296,109	$ 106,237	$ 29,144
Supplemental cash flow disclosure:			
Cash paid for interest	$ 2,689	$ 6,343	$ 5,816
Cash paid for income taxes	$ 1,755	$ 775	$ 909
Supplemental disclosures of non-cash investing and financing activities:			
Acquisition funded by issuance of common stock	$ —	$ 19,219	$ —
Purchases of fixed assets included in accounts payable	$ 672	$ 895	$ 551
Accrued interest payable unpaid upon exchange of convertible notes due 2023	$ 833	$ —	$ —

See Notes to Consolidated Financial Statements.

ENPHASE ENERGY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. DESCRIPTION OF BUSINESS AND BASIS OF PRESENTATION

Description of Business

Enphase Energy, Inc. (the “Company”) is a global energy technology company. The Company delivers smart, easy-to-use solutions that manage solar generation, storage and communication on one intelligent platform. The Company revolutionized the solar industry with its microinverter technology and produces a fully integrated solar-plus-storage solution.

Basis of Presentation and Consolidation

The accompanying consolidated financial statements are presented in accordance with accounting principles generally accepted in the United States (“U.S.”), or GAAP. The consolidated financial statements include the accounts of the Company and its wholly-owned subsidiaries. All intercompany balances and transactions have been eliminated in consolidation.

Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of income and expenses during the reporting period. Significant estimates and assumptions reflected in the financial statements include revenue recognition, inventory valuation, accrued warranty obligations, incremental borrowing rate for right-of-use assets and lease liability, and tax valuation allowance. These estimates are based on information available as of the date of the financial statements; therefore, actual results could differ materially from management’s estimates using different assumptions or under different conditions.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Revenue Recognition

The Company generates revenue from sales of its solutions, which include microinverter units and related accessories, an Envoy communications gateway, the cloud-based Enlighten monitoring service, and AC Battery storage solutions to distributors, large installers, original equipment manufacturers (“OEMs”) and strategic partners.

On January 1, 2018, the Company adopted Accounting Standards Codification (“ASC”) No. 606, “Revenue Recognition” (“ASC 606” or “Topic 606”) and applied the modified retrospective method to all contracts that were not completed as of January 1, 2018. The most significant impacts upon adoption of Topic 606 were how the Company accounts for revenue related to its Envoy™ communications device and related Enphase Enlighten Software™, or Enlighten, service and the timing of when certain sales incentives are recognized. The full consideration for these products represents a single performance obligation and is deferred and recognized over the estimated service period.

Revenues are recognized when control of the promised goods or services are transferred to the Company’s customers in an amount that reflects the consideration that is expected to be received in exchange for those goods or services. The Company generates all of its revenues from contracts with its customers. A description of principal activities from which the Company generates revenues follows.

- *Products Delivered at a Point in Time.* The Company sells its products to customers in accordance with the terms of the related customer contracts. The Company generates revenues from sales of its solutions, which include microinverter units and related accessories, an Envoy communications gateway and Enlighten service, communications accessories and AC Battery™ storage solutions to distributors, large installers, OEMs and strategic partners. Microinverter units, microinverter accessories, and AC Battery storage solutions are delivered to customers at a point in time, and the Company recognizes revenue for these products when the Company transfers control of the product to the customer, which is generally upon shipment.

- *Products Delivered Over Time.* The sale of an Envoy communications gateway includes the Company's Enlighten cloud-based monitoring service. The full consideration for these products represents a single performance obligation and is deferred at the sale date and recognized over the estimated service period of 6 years. The Company also sells certain communication accessories that are delivered over time. The revenue from these products is recognized over the related service period, which is typically 5 or 12 years.

The Company previously sold its Envoy communications device to certain customers under a long-term financing arrangement. Under this financing arrangement, the Company nets the unbilled receivables against deferred revenue.

The Company records certain contra revenue promotions as variable consideration and recognizes these promotions at the time the related revenue is recorded.

The Company records upfront contract acquisition costs, such as sales commissions, to be capitalized and amortized over the estimated life of the asset. For contracts that have a duration of less than one year, the Company follows the Topic 606 practical expedient and expenses these costs when incurred. Commissions related to the Company's sale of monitoring hardware and service are capitalized and amortized over the period of the associated revenue, which is 6 years.

See Note 3. "Revenue Recognition," for additional information related to revenue recognition.

Cost of Revenues

The Company includes the following in cost of revenues: product costs, warranty, manufacturing personnel and logistics costs, freight costs, inventory write-downs, hosting services costs related to the Company's Enlighten service offering, and depreciation and amortization of manufacturing test equipment. A description of principal activities from which the Company recognizes cost of revenue is as follows.

- *Products Delivered at a Point in Time.* Cost of revenue from these products is recognized when the Company transfers control of the product to the customer, which is generally upon shipment.
- *Products Delivered Over Time.* Cost of revenue from these products is recognized over the related service period.

Cash and Cash Equivalents

The Company considers all highly liquid investments, such as certificates of deposit and money market instruments with maturities of twelve months or less at the time of acquisition to be cash equivalents. For all periods presented, its cash balances consist of amounts held in non-interest-bearing and interest-bearing deposits and money market accounts.

Restricted Cash

Restricted cash represents cash held as certificate of deposit collateralized under a letter of credit issued to a customer. The letter of credit is required as a performance security in a face amount equal to the aggregate purchase price of the executed sales agreement. The letter of credit was issued per the terms of the executed sales agreement with a customer for safe harbor prepayment and the Company has collateralized a certificate of deposit under this letter of credit in an amount of $44.7 million, which was reflected as restricted cash on the Company's consolidated balance sheet as of December 31, 2019.

Fair Value of Financial Instruments

The carrying amounts of the Company's cash, cash equivalents and restricted cash, accounts receivable, accounts payable and accrued liabilities approximate fair value because of the short maturity of those instruments.

Accounts Receivables and Contract Assets

The Company receives payments from customers based upon contractual billing schedules. Accounts receivable are recorded when the right to consideration becomes unconditional. Contract assets include deferred product costs and commissions associated with the deferred revenue and will be amortized along with the associated revenue.

Allowance for Doubtful Accounts

The Company maintains allowances for doubtful accounts for uncollectible accounts receivable. Management estimates anticipated losses from doubtful accounts based on days past due, collection history and the financial health of customers. The following table sets forth activities in the allowance for doubtful accounts for the periods indicated.

	December 31, 2019	2018	2017
	(In thousands)		
Balance, at beginning of year	$ 2,138	$ 2,378	$ 2,921
Net charges to expenses	217	711	476
Write-offs, net of recoveries	(1,791)	(951)	(1,019)
Balance, at end of year	$ 564	$ 2,138	$ 2,378

Inventory

Inventory is valued at the lower of cost or market. Market is current replacement cost (by purchase or by reproduction, dependent on the type of inventory). In cases where market exceeds net realizable value (*i.e.*, estimated selling price less reasonably predictable costs of completion and disposal), inventories are stated at net realizable value. Market is not considered to be less than net realizable value reduced by an allowance for an approximately normal profit margin. The Company determines cost on a first-in first-out basis. Management assesses the valuation on a quarterly basis and writes down the value for any excess and obsolete inventory based upon expected demand, anticipated sales price, effect of new product introductions, product obsolescence, customer concentrations, product merchantability and other factors. Inventory write-downs are equal to the difference between the cost of inventories and market.

Long-Lived Assets

Property and equipment are stated at cost less accumulated depreciation. Cost includes amounts paid to acquire or construct the asset as well as any expenditure that substantially adds to the value of or significantly extends the useful life of an existing asset. Repair and maintenance costs are expensed as incurred. Depreciation and amortization are computed using the straight-line method over the estimated useful lives of the assets, which range from 3 to 10 years. Leasehold improvements are amortized over the shorter of the lease term or expected useful life of the improvements.

Internal-use software, whether purchased or developed, is capitalized at cost and amortized on a straight-line basis over its estimated useful life. Costs associated with internally developed software are expensed until the point at which the project has reached the development stage. Subsequent additions, modifications or upgrades to internal-use software are capitalized only to the extent that they provide additional functionality. Software maintenance and training costs are expensed in the period in which they are incurred. The capitalization of internal-use software requires judgment in determining when a project has reached the development stage and the period over which the Company expects to benefit from the use of that software.

Property, plant and equipment, including internal-use software, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset (asset group) may not be recoverable. An impairment loss would be recognized when the carrying amount of an asset exceeds the estimated undiscounted future cash flows expected to result from the use of the asset and its eventual disposition. The amount of the impairment loss to be recorded is calculated by the excess of the asset's carrying value over its fair value. Fair value is generally determined using a discounted cash flow analysis. The Company recorded asset impairment charges for specific assets that were no longer in use of approximately $1.1 million, $1.6 million and $0.8 million for the years ended 2019, 2018 and 2017, respectively. There were no events or changes in circumstances that may indicate the carrying amount of remaining assets is not recoverable.

Business Combinations

Assets acquired and liabilities assumed as part of a business acquisition are generally recorded at their fair value at the date of acquisition. The excess of purchase price over the fair value of assets acquired and liabilities assumed is recorded as goodwill. Determining fair value of identifiable assets, particularly intangibles, and liabilities acquired also requires the Company to make estimates, which are based on all available information and in some cases assumptions with respect to the timing and amount of future revenues and expenses associated with an asset. Accounting for business acquisitions requires the Company to make judgments as to whether a purchase transaction is a multiple element contract, meaning that it includes other transaction components. This judgment and determination affect the amount of consideration paid that is allocable to assets and liabilities acquired in the business purchase transaction.

Goodwill

Goodwill results from the purchase consideration paid in excess of the fair value of the net assets recorded in connection with a business acquisition. Goodwill is not amortized but is assessed for potential impairment at least annually during the fourth quarter of each fiscal year or between annual tests if an event occurs or circumstances change that would indicate the carrying amount may be impaired. Goodwill is tested at the reporting unit level, which the Company has determined to be the same as the entity as a whole (entity level). The Company first performs qualitative assessment to determine whether it is more likely than not that the fair value of our reporting unit is less than its carrying value. If, after assessing the qualitative factors, we determine that it is more likely than not that the fair value of our reporting unit is less than its carrying value, an impairment analysis will be performed.

Qualitative factors include industry and market consideration, overall financial performance, share price trends and market capitalization and Company-specific events. The Company determined, after performing a qualitative review of its reporting unit, that it is more likely than not that the fair value of our reporting unit exceeds its carrying value. Accordingly, there was no indication of impairment in the years ended 2019, 2018 and 2017 and no quantitative goodwill impairment test was performed.

Intangible Assets

Intangible assets include patents and other purchased intangible assets. Intangible assets with finite lives are amortized on a straight-line basis, with estimated useful lives ranging from 3 to 9 years. Indefinite-lived intangible assets are tested for impairment annually and are also tested for impairment between annual tests if an event occurs or circumstances change that would indicate that the carrying amount may be impaired. Intangible assets with finite lives are tested for impairment whenever events or circumstances indicate that the carrying amount of an asset (asset group) may not be recoverable. An impairment loss is recognized when the carrying amount of an asset exceeds the estimated undiscounted cash flows used in determining the fair value of the asset. The amount of the impairment loss to be recorded is calculated by the excess of the asset's carrying value over its fair value. Fair value is generally determined using a discounted cash flow analysis. There was no impairment of intangible assets in any of the years presented.

Contract Liabilities

Contract liabilities are recorded as deferred revenue on the accompanying consolidated balance sheets and include payments received in advance of performance obligations under the contract and are realized when the associated revenue is recognized under the contract.

Warranty Obligations

Microinverters Sold Through December 31, 2013

The Company's warranty accrual provides for the replacement of microinverter units that fail during the product's warranty term (typically 15 years for first and second generation microinverters and up to 25 years for third and fourth generation microinverters). On a quarterly basis, the Company employs a consistent, systematic and rational methodology to assess the adequacy of its warranty liability. This assessment includes updating all key estimates and assumptions for each generation of product, based on historical results, trends and the most current data available as of the filing date. The key estimates and assumptions used in the warranty liability are thoroughly reviewed by management on a quarterly basis. The key estimates used by the Company to estimate its warranty liability are: (1) the number of units expected to fail over time (*i.e.,* failure rate); (2) the number of failed units expected to result in warranty claims over time (*i.e.,* claim rate); and (3) the per unit cost of replacement units, including outbound shipping and limited labor costs, expected to be incurred to replace failed units over time (*i.e.,* replacement cost).

Estimated Failure Rates — The Company's Quality and Reliability department has primary responsibility to determine the estimated failure rates for each generation of microinverter. To establish initial failure rate estimates for each generation of microinverter, the Company's quality engineers use a combination of industry standard Mean Time Between Failure ("MTBF") estimates for individual components contained in its microinverters, third party data collected on similar equipment deployed in outdoor environments similar to those in which the Company's microinverters are installed, and rigorous long term reliability and accelerated life cycle testing which simulates the service life of the microinverter in a short period of time. As units are deployed into operating environments, the Company continues to monitor product performance through its Enlighten monitoring platform. It typically takes three to nine months between the date of sale and date of end-user installation. Consequently, the Company's ability to monitor actual failures of units sold similarly lags by three to nine months. When a microinverter fails and is returned, the Company performs diagnostic root cause failure analysis to understand and isolate the underlying mechanism(s) causing the failure. The Company then uses the results of this analysis (combined with the actual, cumulative performance data collected on those units prior to failure through Enlighten) to draw conclusions with respect to how or if the identified failure mechanism(s) will impact the remaining units deployed in the installed base.

Estimated Claim Rates — Warranty claim rate estimates are based upon observed historical trends and assumptions with respect to expected customer behavior over the warranty period. As the vast majority of the Company's microinverters have been sold to end users for residential applications, the Company believes that warranty claim rates will be affected by changes over time in residential home ownership because the Company expects that subsequent homeowners are less likely to file claims than the homeowners who originally purchase the microinverters.

Estimated Replacement Costs — Three factors are considered in the Company's analysis of estimated replacement cost: (1) the estimated cost of replacement microinverters; (2) the estimated cost to ship replacement microinverters to end users; and (3) the estimated labor reimbursement expected to be paid to third party installers performing replacement services for the end user. Because the Company's warranty provides for the replacement of defective microinverters over long periods of time (between 15 and 25 years, depending on the generation of product purchased), the estimated per unit cost of current and future product generations is considered in the estimated replacement cost. Estimated costs to ship replacement units are based on observable, market-based shipping costs paid by the Company to third party freight carriers. The Company has a separate program that allows third-party installers to claim fixed-dollar reimbursements for labor costs they incur to replace failed microinverter units for a limited time from the date of original installation. Included in the Company's estimated replacement cost is an analysis of the number of fixed-dollar labor reimbursements expected to be claimed by third party installers over the limited offering period.

In addition to the key estimates noted above, the Company also compares actual warranty results to expected results and evaluates any significant differences. Management may make additional adjustments to the warranty provision based on performance trends or other qualitative factors. If actual failure rates, claim rates, or replacement costs differ from the Company's estimates in future periods, changes to these estimates may be required, resulting in increases or decreases in the Company's warranty obligations. Such increases or decreases could be material.

Fair Value Option for Microinverters Sold Since January 1, 2014

The Company's warranty obligations related to microinverters sold since January 1, 2014 provide the Company the right, but not the requirement, to assign its warranty obligations to a third-party. Under ASC 825, "Financial Instruments" (also referred to as "fair value option"), an entity may choose to elect the fair value option for such warranties at the time it first recognizes the eligible item. The Company made an irrevocable election to account for all eligible warranty obligations associated with microinverters sold since January 1, 2014 at fair value. This election was made to reflect the underlying economics of the time value of money for an obligation that will be settled over an extended period of up to 25 years.

The Company estimates the fair value of warranty obligations by calculating the warranty obligations in the same manner as for sales prior to January 1, 2014 and applying an expected present value technique to that result. The expected present value technique, an income approach, converts future amounts into a single current discounted amount. In addition to the key estimates of failure rates, claim rates and replacement costs, the Company used certain inputs that are unobservable and significant to the overall fair value measurement. Such additional assumptions included compensation comprised of a profit element and risk premium required of a market participant to assume the obligation and a discount rate based on the Company's credit-adjusted risk-free rate. See Note 9. "Fair Value Measurements," for additional information.

Warranty obligations initially recorded at fair value at the time of sale will be subsequently re-measured to fair value at each reporting date. In addition, the fair value of the liability will be accreted over the corresponding term of the warranty of up to 25 years using the interest method.

Warranty for Other Products

The Company offers a 5-year warranty for its Envoy communications gateway and a 10-year warranty on its AC Battery storage solution. The warranties provide the Company with the right, but not the obligation, to assign its warranty obligations to a third-party. As such, warranties for Envoy and AC Battery storage solution products are accounted for under the fair value method of accounting.

Research and Development Costs

The Company expenses research and development costs as incurred. Research and development expense consists primarily of product development personnel costs, including salaries and benefits, stock-based compensation, other professional costs and allocated facilities costs.

Stock-Based Compensation

Share-based payments are required to be recognized in the Company's consolidated statements of operations based on their fair values and the estimated number of shares expected to vest. The Company measures stock-based compensation expense for all share-based payment awards, including stock options made to employees and directors, based on the estimated fair values on the date of the grant. The fair value of stock options granted is estimated using the Black-Scholes option valuation model. The fair value of restricted stock units granted is determined based on the price of the Company's common stock on the date of grant. The fair value of non-market-based performance stock units granted is determined based on the date of grant or when achievement of performance is probable. The fair value of market-based performance stock units granted is determined using a Monte-Carlo model based on the date of grant or when achievement of performance is probable.

Stock-based compensation for stock options and restricted stock units ("RSUs") is recognized on a straight-line basis over the requisite service period. Stock-based compensation for performance stock units ("PSUs") without market conditions is recognized when the performance condition is probable of being achieved, and then on a graded basis over the requisite service period. Stock-based compensation for PSUs with market conditions is recognized on a straight-line basis over the requisite service period. Additionally, the Company estimates its forfeiture rate annually based on historical experience and revise the estimates of forfeiture in subsequent periods if actual forfeitures differ from those estimates.

Leases

The Company determines if an arrangement is or contains a lease at inception. Operating lease assets represent the Company's right to use an underlying asset for the lease term and lease liabilities represent the Company's obligation to make lease payments over the lease term.

Operating lease assets and liabilities are recognized based on the present value of the remaining lease payments discounted using the Company's incremental borrowing rate. Operating lease assets also include initial direct costs incurred and prepaid lease payments, minus any lease incentives. The Company's lease terms include options to extend or terminate the lease when it is reasonably certain that the Company will exercise that option. Lease expense is recognized on a straight-line basis over the lease term.

The Company combines the lease and non-lease components in determining the operating lease assets and liabilities.

Foreign Currency Translation

The Company and most of its subsidiaries use their respective local currency as their functional currency. Accordingly, foreign currency assets and liabilities are translated using exchange rates in effect at the end of the period. Aggregate exchange gains and losses arising from the translation of foreign assets and liabilities are included in accumulated other comprehensive income (loss) in stockholders' equity. Foreign subsidiaries that use the U.S. dollar as their functional currency remeasure monetary assets and liabilities using exchange rates in effect at the end of the period. In addition, transactions that are denominated in non-functional currency are remeasured using exchange rates in effect at the end of the period. Exchange gains and losses arising from the remeasurement of monetary assets and liabilities are included in other income (expense), net in the consolidated statements of operations. Non-monetary assets and liabilities are carried at their historical values.

Comprehensive Income (Loss)

Comprehensive income (loss) consists of two components, net income (loss) and other comprehensive income (loss). Other comprehensive income (loss) refers to gains and losses that are recorded as an element of stockholders' equity but are excluded from net income (loss). The Company's other comprehensive income (loss) consists of foreign currency translation adjustments for all periods presented.

Income Taxes

The Company records income taxes using the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected tax consequences of temporary differences between the tax bases of assets and liabilities for financial reporting purposes and amounts recognized for income tax purposes. In estimating future tax consequences, generally all expected future events other than enactments or changes in the tax law or rates are considered. Valuation allowances are provided when necessary to reduce deferred tax assets to the amount expected to be realized.

The Company assesses the realizability of the deferred tax assets to determine release of valuation allowance as necessary. In the event the Company determines that it is more likely than not that we would be able to realize deferred tax assets in the future in excess of our net recorded amount, an adjustment to the valuation allowance for the deferred tax asset would increase income in the period such determination was made. Likewise, should it be determined that additional amounts of the net deferred tax asset will not be realized in the future, an adjustment to increase the deferred tax asset valuation allowance will be charged to income in the period such determination is made.

The Company operates in various tax jurisdictions and is subject to audit by various tax authorities. The Company follows accounting for uncertainty in income taxes which requires that the tax effects of a position be recognized only if it is "more likely than not" to be sustained based solely on its technical merits as of the reporting date. The Company considers many factors when evaluating and estimating its tax positions and tax benefits, which may require periodic adjustments and which may not accurately anticipate actual outcomes.

Recently Adopted Accounting Pronouncements

In February 2016, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") 2016-02, "Leases (Topic 842)." ASU 2016-02 requires an entity to recognize a right-of-use asset and lease liability for all leases with terms of more than 12 months. The guidance requires lessees to recognize all leases, with certain exceptions, on their balance sheets, whether operating or financing, while continuing to recognize the expenses on their income statements in a manner similar to current practice. The guidance states that a lessee must recognize a lease liability for the obligation to make lease payments and a right-to-use asset for the right to use the underlying asset for the lease term. On January 1, 2019, the Company adopted ASU 2016-02 using the modified retrospective transition option of applying the new standard at the adoption date for all leases with terms greater than 12 months. The Company elected certain practical expedients upon adoption and as such did not reassess the following: 1) whether any expired or existing contracts are or contain leases; 2) lease classification for any expired or existing leases; 3) initial direct costs for any expired or existing leases; 4) whether existing or expired land easements are or contain leases; and 5) regarding the lease term, from a hindsight perspective, whether or not the Company is reasonably certain to exercise the lease options. However, the Company will evaluate new or modified land easements under the new guidance after the commencement date. The Company also elected the practical expedient to not separate lease and non-lease components. The adoption of ASU 2016-02 on January 1, 2019 resulted in an increase in operating leases, right of use asset of $8.4 million, an increase in other liabilities of $6.8 million, an increase in accrued liabilities and other of $1.5 million and a decrease in other assets of $0.1 million on the Company's consolidated balance sheets with no impact on the Company's consolidated statements of operations.

In June 2018, the FASB issued ASU 2018-07, "Compensation - Stock Compensation: Improvements to Non-employee Share-Based Payment Accounting." ASU 2018-07 was issued to provide guidance on share-based payments granted to non-employees in exchange for goods or services used or consumed in an entity's own operations and supersedes the guidance in ASC 505-50, "Equity-Based Payments to Non-Employees." ASU 2018-07 aligns much of the guidance on measuring and classifying non-employee awards with that of awards to employees. The Company adopted ASU 2018-07 on January 1, 2019 using the modified retrospective basis. The adopted standard did not have a material impact on the consolidated financial statements.

Recently Issued Accounting Pronouncements Not Yet Effective

In August 2018, the FASB issued ASU 2018-15, "Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract," to reduce diversity in practice in accounting for the costs of implementing cloud computing arrangements that are service contracts. ASU 2018-15 allows entities to apply the guidance in the ASC 350-40, "Intangibles–Goodwill and Other–Internal-Use Software," to determine which implementation costs are eligible to be capitalized as assets in a cloud computing arrangement that is considered a service contract. ASU 2018-15 is effective for fiscal years beginning after December 15, 2019, and interim periods within those fiscal years. Early adoption is permitted, including adoption in any interim period. Entities have the option to apply the guidance prospectively to all implementation costs incurred after the date of adoption or retrospectively and are required to make certain disclosures in the interim and annual period of adoption. We will adopt the new standard effective January 1, 2020 and do not expect the adoption of this guidance to have a material impact on our consolidated financial statements.

In June 2016, the FASB issued ASU 2016-13, "Financial Instruments-Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments," which requires the measurement and recognition of expected credit losses for financial assets held at amortized cost. ASU 2016-13 replaces the existing incurred loss impairment model with a forward-looking expected credit loss model which will result in earlier recognition of credit losses. We will adopt the new standard effective January 1, 2020 and do not expect the adoption of this guidance to have a material impact on our consolidated financial statements.

3. REVENUE RECOGNITION

Disaggregated Revenue

The Company has one business activity, which is the design, manufacture and sale of solutions for the solar photovoltaic ("PV") industry. Disaggregated revenue by primary geographical market and timing of revenue recognition for the Company's single product line are as follows:

	Years Ended December 31,	
	2019	2018
	(In thousands)	
Primary geographical markets:		
United States	$ 523,577	$ 219,600
International	100,756	96,559
Total	$ 624,333	$ 316,159
Timing of revenue recognition:		
Products delivered at a point in time	$ 584,556	$ 270,778
Products and services delivered over time	39,777	45,381
Total	$ 624,333	$ 316,159

Contract Balances

Receivables, and contract assets and contract liabilities from contracts with customers are as follows:

	December 31, 2019	December 31, 2018
	(In thousands)	
Receivables	$ 145,413	$ 78,938
Short-term contract assets (Prepaid expenses and other assets)	15,055	13,516
Long-term contract assets (Other assets)	42,087	34,148
Short-term contract liabilities (Deferred revenues)	81,783	33,119
Long-term contract liabilities (Deferred revenues)	100,204	76,911

The Company receives payments from customers based upon contractual billing schedules. Accounts receivable are recorded when the right to consideration becomes unconditional. Contract assets include deferred product costs and commissions associated with the deferred revenue and will be amortized along with the associated revenue. The Company had no asset impairment charges related to contract assets in the years ended December 31, 2019.

Significant changes in the balances of contract assets (prepaid expenses and other assets) during the period are as follows (in thousands):

Contract Assets	
Balance on December 31, 2018	$ 47,664
Amount recognized	(15,144)
Increase	24,622
Balance as of December 31, 2019	$ 57,142

Contract liabilities are recorded as deferred revenue on the accompanying consolidated balance sheets and include payments received in advance of performance obligations under the contract and are realized when the associated revenue is recognized under the contract.

For the year ended December 31, 2019, contract liabilities include $49.9 million of safe harbor cash prepayments from its customers for products to be delivered in 2020, which represents the amount equal to the aggregate purchase price of the executed sales agreement. Of the $49.9 million, a letter of credit of $44.7 million was issued for the benefit of one customer and the Company has collateralized under the letter of credit a certificate of deposit of $44.7 million.

Significant changes in the balances of contract liabilities (deferred revenues) during the period are as follows (in thousands):

Contract Liabilities		
Balance on December 31, 2018	$	110,030
Revenue recognized		(39,777)
Increase due to billings		61,825
Increase due to safe harbor prepayments		49,909
Balance as of December 31, 2019	$	181,987

Remaining Performance Obligations

Estimated revenue expected to be recognized in future periods related to performance obligations that are unsatisfied or partially unsatisfied at the end of the reporting period are as follows:

	December 31, 2019	
	(In thousands)	
Fiscal year:		
2020	$	81,783
2021		30,665
2022		25,633
2023		19,841
2024		14,650
Thereafter		9,415
Total	$	181,987

Estimated revenue expected to be recognized in fiscal year 2020 of $81.8 million includes $44.5 million of safe harbor prepayments from customers in the fourth quarter of 2019 for product delivery to the customer in the first quarter of 2020. Remaining $5.4 million of safe harbor prepayments from customers in the fourth quarter of 2019 for product delivery to the customer in the first quarter of 2020 relates to the sale of Envoy communications gateway which will be recognized ratably over the service period.

4. INVENTORY

Inventory consist of the following:

	December 31, 2019		December 31, 2018	
	(In thousands)			
Raw materials	$	4,197	$	970
Finished goods		27,859		15,297
Total inventory	$	32,056	$	16,267

5. PROPERTY AND EQUIPMENT, NET

Property and equipment consist of the following:

	Estimated Useful Life	December 31, 2019		December 31, 2018	
	(Years)	(In thousands)			
Equipment and machinery	3-10	$	48,114	$	43,566
Furniture and fixtures	5-10		2,404		2,239
Computer equipment	3-5		1,698		2,958
Capitalized software costs	3-5		11,656		12,114
Leasehold improvements	3-10		8,713		8,482
Construction in process			8,446		3,536
Total			81,031		72,895
Less accumulated depreciation and amortization			(52,095)		(51,897)
Property and equipment, net		$	28,936	$	20,998

Depreciation expense for property and equipment for the years ended December 31, 2019, 2018 and 2017 was $7.3 million, $8.3 million and $8.6 million, respectively.

As of December 31, 2019 and 2018, unamortized capitalized software costs were $0.8 million and $0.7 million, respectively.

6. GOODWILL AND INTANGIBLE ASSETS

The Company's goodwill and purchased intangible assets as of December 31, 2019 and December 31, 2018 are as follows:

	December 31, 2019						December 31, 2018					
	Gross		Accumulated Amortization		Net		Gross		Accumulated Amortization		Net	
	(In thousands)											
Goodwill	$	24,783	$	—	$	24,783	$	24,783	$	—	$	24,783
Intangible assets:												
Other indefinite-lived intangibles	$	286	$	—	$	286	$	286	$	—	$	286
Intangible assets with finite lives:												
Patents and licensed technology		—		—		—		1,665		(1,665)		—
Developed technology		13,100		(3,093)		10,007		13,100		(909)		12,191
Customer relationships		23,100		(2,814)		20,286		23,100		(271)		22,829
Total purchased intangible assets	$	36,486	$	(5,907)	$	30,579	$	38,151	$	(2,845)	$	35,306

In August 2018, the Company acquired certain finite-lived intangible assets in its acquisition of SunPower Corporation's ("SunPower") microinverter business, primarily developed technology and customer relationships pursuant to an Asset Purchase Agreement ("APA"). See Note 20. "Acquisition," of the notes to consolidated financial statements included in Item 8 of the Company's 2019 Annual Report on Form 10-K for additional information related to this acquisition.

Amortization expense related to finite-lived intangible assets are as follows:

	Years Ended December 31,	
	2019	2018
	(In thousands)	
Developed technology, and patents and licensed technology	$ 2,184	$ 1,409
Customer relationships	2,543	271
Total amortization expense	$ 4,727	$ 1,680

Amortization of developed technology, patents and licensed technology is recorded to sales and marketing expense. The developed technology acquired from the Company's acquisition of SunPower's microinverter business was embedded in the microinverters that SunPower sold to its customers. The Company does not actively use the developed technology acquired from SunPower and holds the developed technology to prevent others from using it. Accordingly, the Company accounts for the developed technology as a defensive intangible asset and amortizes the associated value over a period of six years from the date of acquisition.

The master supply agreement ("MSA") entered into with SunPower in August 2018 provides the Company with the exclusive right to supply SunPower with module level power electronics for a period of five years, with options for renewals. The exclusivity arrangement extends throughout the term of the MSA, which comprises all of the expected cash flows from the customer relationship intangible asset, and was a condition to, and was an essential part of the acquisition of SunPower's microinverter business by the Company. As the fair value ascribed to the customer relationship intangible asset represents payments to a customer, the Company amortizes the value of the customer relationship intangible asset as a reduction to revenue using a pattern of economic benefit method over a useful life of nine years.

7. ACCRUED LIABILITIES

Accrued liabilities consist of the following:

	December 31, 2019	December 31, 2018
	(In thousands)	
Salaries, commissions, incentive compensation and benefits	$ 5,524	$ 4,107
Customer rebates and sales incentives	24,198	8,527
Freight	4,908	7,286
Operating lease liabilities, current	3,170	—
Other	9,292	9,090
Total accrued liabilities	$ 47,092	$ 29,010

8. WARRANTY OBLIGATIONS

The Company's warranty activities were as follows:

	Years Ended December 31,		
	2019	2018	2017
		(In thousands)	
Warranty obligations, beginning of period	$ 31,294	$ 29,816	$ 31,414
Accruals for warranties issued during period	5,244	3,040	3,797
Changes in estimates	8,591	6,515	(732)
Settlements	(10,881)	(8,579)	(7,037)
Increase due to accretion expense	2,326	1,989	2,053
Other	524	(1,487)	321
Warranty obligations, end of period	37,098	31,294	29,816
Less: current portion	(10,078)	(8,083)	(7,427)
Noncurrent	$ 27,020	$ 23,211	$ 22,389

The Company began selling its IQ series microinverters in 2017, sales of which totaled approximately 9.6 million units through 2019, and sold approximately 15.7 million units of prior generation microinverters from 2008 through 2019. IQ 7 sales represented 98% of the Company's total microinverter sales for the year ended December 31, 2019.

Changes in Estimates

On a quarterly basis, the Company uses the best and most complete underlying information available, following a consistent, systematic and rational methodology to determine its warranty obligations. The Company considers all available evidence to assess the reasonableness of all key assumptions underlying its estimated warranty obligations for each generation of microinverter. The changes in estimates discussed below resulted from consideration of new or additional information becoming available and subsequent developments. Changes in estimates included in the table above were comprised of the following:

2019

In 2019, the Company recorded a $5.5 million increase to warranty expense related to cost increases primarily driven by increased U.S. tariffs announced during 2019 for its products manufactured in China. The Company also recorded additional warranty expense of $3.1 million based on continuing analysis of field performance data and diagnostic root-cause failure analysis primarily relating to its second and third generation products, partially offset by improved failure rates for its IQ7 series.

2018

In 2018, the Company recorded a $0.9 million increase to warranty expense related to cost increases primarily for backwards compatibility cables, supply constrained inventory components as well as tariffs. The Company also recorded additional warranty expense of $3.3 million based on continuing analysis of field performance data and diagnostic root-cause failure analysis primarily relating to its second and third generation products. In addition, the Company recorded an increase of $2.1 million related to increased estimated claim rates and an increase to warranty expense of $0.2 million for labor reimbursement costs expected to be paid to third party installers performing replacement services. These increases were partially offset by a $1.5 million reduction to warranty expense, presented as "Other" in the table above, related to changes in the discount rates for fair value accounting.

2017

In 2017, primarily in the fourth quarter, the Company recorded the impact of product-cost reduction initiatives for its sixth generation microinverters, which are backwards compatible with previous microinverter generations and will be used to fulfill future warranty obligations for all microinverter generations in the field. This resulted in a $2.2 million decrease to warranty expense related to estimated future replacement costs. The Company also recorded, primarily in the third quarter, a decrease to warranty expense of $1.9 million for labor reimbursement costs expected to be paid to third party installers performing replacement services for its second-generation product. In addition, the Company recorded additional warranty expense of $3.9 million based on continuing analysis of field performance data and diagnostic root-cause failure analysis primarily relating to its second-generation product.

9. FAIR VALUE MEASUREMENTS

The accounting guidance defines fair value as the price that would be received from selling an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. When determining the fair value measurements for assets and liabilities recorded at fair value, the Company considers the principal or most advantageous market in which it would transact and considers assumptions that market participants would use when pricing the asset or liability, such as inherent risk, transfer restrictions, and risk of nonperformance.

The fair value hierarchy requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. An asset's or liability's categorization within the fair value hierarchy is based upon the lowest level of input that is significant to the fair value measurement. Three levels of inputs may be used to measure fair value:

- Level 1—Valuations based on quoted prices in active markets for identical assets or liabilities that the Company is able to access. Since valuations are based on quoted prices that are readily and regularly available in an active market, valuation of such assets or liabilities do not entail a significant degree of judgment.
- Level 2—Valuations based on one or more quoted prices in markets that are not active or for which all significant inputs are observable, either directly or indirectly.
- Level 3—Valuations based on inputs that are unobservable and significant to the overall fair value measurement.

The following table presents the Company's liabilities that were measured at fair value on a recurring basis and its categorization within the fair value hierarchy.

	Fair Value Hierarchy	December 31, 2019	December 31, 2018
		(In thousands)	
Warranty obligations			
Current		$ 6,794	$ 4,288
Non-current		13,012	7,469
Total warranty obligations measured at fair value	Level 3	$ 19,806	$ 11,757

Fair Value Option for Warranty Obligations Related to Microinverters Sold Since January 1, 2014

The Company estimates the fair value of warranty obligations by calculating the warranty obligations in the same manner as for sales prior to January 1, 2014 and applying an expected present value technique to that result. The expected present value technique, an income approach, converts future amounts into a single current discounted amount. In addition to the key estimates of failure rates, claim rates and replacement costs, the Company used certain Level 3 inputs which are unobservable and significant to the overall fair value measurement. Such additional assumptions included a discount rate based on the Company's credit-adjusted risk-free rate and compensation comprised of a profit element and risk premium required of a market participant to assume the obligation.

The following table provides information regarding changes in nonfinancial liabilities related to the Company's warranty obligations measured at fair value on a recurring basis using significant unobservable inputs (Level 3) for the periods indicated.

	Years Ended December 31,		
	2019	2018	2017
		(In thousands)	
Balance at beginning of period	$ 11,757	$ 9,791	$ 10,332
Accruals for warranties issued during period	5,244	3,040	3,591
Changes in estimates	6,167	2,455	(4,551)
Settlements	(6,212)	(4,030)	(1,956)
Increase due to accretion expense	2,326	1,989	2,053
Other	524	(1,488)	322
Balance at end of period	$ 19,806	$ 11,757	$ 9,791

Quantitative and Qualitative Information about Level 3 Fair Value Measurements

As of December 31, 2019 and December 31, 2018, the significant unobservable inputs used in the fair value measurement of the Company's liabilities designated as Level 3 are as follows:

			Percent Used (Weighted Average)	
Item Measured at Fair Value	Valuation Technique	Description of Significant Unobservable Input	December 31, 2019	December 31, 2018
Warranty obligations for microinverters sold since January 1, 2014	Discounted cash flows	Profit element and risk premium	14%	16%
		Credit-adjusted risk-free rate	16%	19%

Sensitivity of Level 3 Inputs - Warranty Obligations

Each of the significant unobservable inputs is independent of the other. The profit element and risk premium are estimated based on requirements of a third-party participant willing to assume the Company's warranty obligations. The credit-adjusted risk-free rate ("discount rate") is determined by reference to the Company's own credit standing at the fair value measurement date. Increasing the profit element and risk premium input by 100 basis points would result in a $0.2 million increase to the liability. Decreasing the profit element and risk premium by 100 basis points would result in a $0.2 million reduction of the liability. Increasing the discount rate by 100 basis points would result in a $0.8 million reduction of the liability. Decreasing the discount rate by 100 basis points would result in a $0.9 million increase to the liability.

10. RESTRUCTURING

Restructuring expense consist of the following:

	Years Ended December 31,		
	2019	2018	2017
		(In thousands)	
Redundancy and employee severance and benefit arrangements	$ 1,575	$ 2,228	$ 2,827
Asset impairments	1,124	1,601	522
Consultants engaged in restructuring activities	—	—	12,100
Lease loss reserves	(100)	300	1,468
Total restructuring charges	$ 2,599	$ 4,129	$ 16,917

2018 Plan

In the third quarter of 2018, the Company began implementing restructuring actions (the "2018 Plan") to lower its operating expenses. The restructuring actions include reorganization of the Company's global workforce, elimination of certain non-core projects and consolidation of facilities. The Company completed its restructuring activities under the 2018 Plan in 2019.

The following table provides information regarding changes in the Company's 2018 Plan accrued restructuring balance for the periods indicated.

	Redundancy and Employee Severance and Benefits	Lease Loss Reserves and Contractual Obligations	Total
		(In thousands)	
Balance as of December 31, 2018	$ 904	$ 288	$ 1,192
Charges	2,699	—	2,699
Cash payments	(1,610)	—	(1,610)
Non-cash settlement and other	(1,993)	(288)	(2,281)
Balance as of December 31, 2019	$ —	$ —	$ —

The following table presents the details of the Company's restructuring charges under the 2018 Plan for the period indicated:

	Years Ended December 31, 2019	Years Ended December 31, 2018
	(In thousands)	
Redundancy and employee severance and benefit arrangements	$ 1,575	$ 2,228
Asset impairments	1,124	1,636
Lease loss reserves	(100)	340
Total restructuring charges	$ 2,599	$ 4,204

2016 Plan

In the third quarter of 2016, the Company began implementing restructuring actions (the "2016 Plan") to lower its operating expenses. The restructuring actions have included reductions in the Company's global workforce, the elimination of certain non-core projects, consolidation of office space at the Company's corporate headquarters and the engagement of management consultants to assist the Company in making organizational and structural changes to improve operational efficiencies and reduce expenses. The Company completed its restructuring activities under the 2016 Plan in 2017.

The following table provides information regarding changes in the Company's 2016 Plan accrued restructuring balance for the periods indicated.

	Employee Severance and Benefits	Lease Loss Reserves and Contractual Obligations	Total
		(In thousands)	
Balance as of December 31, 2017	229	1,094	1,323
Charges and adjustments	—	(40)	(40)
Cash payments and receipts, net	(229)	537	308
Balance as of December 31, 2018	—	$ 1,591	1,591
Other [(1)]	—	(1,591)	(1,591)
Balance as of December 31, 2019	$ —	$ —	$ —

(1) Adoption of ASU 2016-02.

11. DEBT

The following table provides information regarding the Company's long-term debt.

	December 31, 2019	December 31, 2018
	(In thousands)	
Convertible notes		
Notes due 2024	$ 132,000	$ —
Less: unamortized discount and issuance costs	(35,815)	—
Carrying amount of Notes due 2024	96,185	—
Notes due 2023	5,000	65,000
Less: unamortized issuance costs	(143)	(2,361)
Carrying amount of Notes due 2023	4,857	62,639
Term loan	—	41,524
Less: unamortized discount and issuance costs	—	(1,059)
Carrying amount of term loan	—	40,465
Sale of long-term financing receivable recorded as debt	4,501	6,679
Total carrying amount of debt	105,543	109,783
Less: current portion term loan	—	(25,417)
Less: current portion of long-term financing receivable recorded as debt	(2,884)	(2,738)
Long-term debt	$ 102,659	$ 81,628

Convertible Senior Notes due 2024

On June 5, 2019, the Company issued $132.0 million aggregate principal amount of 1.0% convertible senior notes due 2024 (the "Notes due 2024"). The Notes due 2024 are general unsecured obligations and bear interest at an annual rate of 1.0% per year, payable semi-annually on June 1 and December 1 of each year, beginning December 1, 2019. The Notes due 2024 are governed by an indenture between the Company and U.S. Bank National Association, as trustee. The Notes due 2024 will mature on June 1, 2024, unless earlier repurchased by the Company or converted at the option of the holders. The Company may not redeem the notes prior to the maturity date, and no sinking fund is provided for the notes. The Notes due 2024 may be converted, under certain circumstances as described below, based on an initial conversion rate of 48.7781 shares of common stock per $1,000 principal amount (which represents an initial conversion price of $20.5010 per share). The conversion rate for the Notes due 2024 will be subject to adjustment upon the occurrence of certain specified events but will not be adjusted for accrued and unpaid interest. In addition, upon the occurrence of a make-whole fundamental change (as defined in the relevant indenture), the Company will, in certain circumstances, increase the conversion rate by a number of additional shares for a holder that elects to convert its notes in connection with such make-whole fundamental change. The Company received approximately $128.0 million in net proceeds, after deducting the initial purchasers' discount, from the issuance of the Notes due 2024.

The Notes due 2024 may be converted on any day prior to the close of business on the business day immediately preceding December 1, 2023, in multiples of $1,000 principal amount, at the option of the holder under any of the following circumstances: (1) during any calendar quarter commencing after the calendar quarter ending on September 30, 2019 (and only during such calendar quarter), if the last reported sale price of the Company's common stock for at least 20 trading days (whether or not consecutive) during a period of 30 consecutive trading days ending on, and including, the last trading day of the immediately preceding calendar quarter is greater than or equal to $26.6513 (130% of the conversion price) on each applicable trading day; (2) during the five business day period after any five consecutive trading day period (the "measurement period") in which the "trading price" (as defined in the relevant indenture) per $1,000 principal amount of notes for each trading day of the measurement period was less than 98% of the product of the last reported sale price of the Company's common stock and the conversion rate on each such trading day; or (3) upon the occurrence of specified corporate events. On and after December 1, 2023 until the close of business on the second scheduled trading day immediately preceding the maturity date of June 1, 2024, holders may convert their notes at any time, regardless of the foregoing circumstances. Upon the occurrence of a fundamental change (as defined in the relevant indenture), holders may require the Company to repurchase all or a portion of their Notes due 2024 for cash at a price equal to 100% of the principal amount of the notes to be repurchased plus any accrued and unpaid interest to, but excluding, the fundamental change repurchase date.

Upon conversion of any of the notes, the Company will pay or deliver, as the case may be, cash, shares of common stock or a combination of cash and common stock, at the Company's election.

In accounting for the issuance of the Notes due 2024, on June 5, 2019, the Company separated the Notes due 2024 into liability and equity components. The carrying amount of the liability component of approximately $95.6 million was calculated by using a discount rate of 7.75%, which was the Company's borrowing rate on the date of the issuance of the notes for a similar debt instrument without the conversion feature. The carrying amount of the equity component of approximately $36.4 million, representing the conversion option, was determined by deducting the fair value of the liability component from the par value of the Notes due 2024. The equity component of the Notes due 2024 is included in additional paid-in capital in the consolidated balance sheet and is not remeasured as long as it continues to meet the conditions for equity classification. The difference between the principal amount of the Notes due 2024 and the liability component (the "debt discount") is amortized to interest expense using the effective interest method over the term of the Notes due 2024.

The Company separated the Notes due 2024 into liability and equity components, this resulted in a tax basis difference associated with the liability component that represents a temporary difference. The Company recognized the deferred taxes of $0.3 million for the tax effect of that temporary difference as an adjustment to the equity component included in additional paid-in capital in the consolidated balance sheet.

Debt issuance costs for the issuance of the Notes due 2024 were approximately $4.6 million, consisting of initial purchasers' discount and other issuance costs. In accounting for the transaction costs, the Company allocated the total amount incurred to the liability and equity components using the same proportions as the proceeds from the Notes due 2024. Transaction costs attributable to the liability component were approximately $3.3 million, were recorded as debt issuance cost (presented as contra debt in the consolidated balance sheet) and are being amortized to interest expense over the term of the Notes due 2024. The transaction costs attributable to the equity component were approximately $1.3 million and were netted with the equity component in stockholders' equity. As of December 31, 2019, the unamortized deferred issuance cost for the Notes due 2024 was $2.9 million on the consolidated balance sheet.

The following table presents the total amount of interest cost recognized relating to the Notes due 2024:

	Year Ended December 31, 2019
	(In thousands)
Contractual interest expense	$ 759
Amortization of debt discount	3,492
Amortization of debt issuance costs	375
Total interest cost recognized	$ 4,626

The effective interest rate on the liability component Notes due 2024 was 7.75% for the years ended December 31, 2019, which remain unchanged from the date of issuance. The remaining unamortized debt discount was $32.9 million as of December 31, 2019, will be amortized over approximately 4.4 years.

The Company carries the Notes due 2024 at face value less unamortized discount and issuance costs on its condensed consolidated balance sheet. The fair value of the Notes due 2024 was determined to be $190.9 million based on the closing trading prices per $100 principal amount as of the last day of trading for the period. The Company considers the fair value of the Notes due 2024 to be a Level 2 measurement as they are not actively traded.

Convertible Note Hedge and Warrant Transactions

In connection with the offering of the Notes due 2024, the Company entered into privately-negotiated convertible note hedge transactions pursuant to which the Company has the option to purchase a total of approximately 6.4 million shares of its common stock (subject to anti-dilution adjustments), which is the same number of shares initially issuable upon conversion of the notes, at a price of $20.5010 per share, which is the initial conversion price of the Notes due 2024. The total cost of the convertible note hedge transactions was approximately $36.3 million. The convertible note hedge transactions are expected generally to reduce potential dilution to the Company's common stock upon any conversion of the Notes due 2024 and/or offset any cash payments the Company is required to make in excess of the principal amount of converted notes, as the case may be. As of December 31, 2019, the Company had not purchased any shares under the convertible note hedge transactions.

Additionally, the Company separately entered into privately-negotiated warrant transactions (the "Warrants") whereby the Company sold warrants to acquire approximately 6.4 million shares of the Company's common stock (subject to anti-dilution adjustments) at an initial strike price of $25.2320 per share. The Company received aggregate proceeds of approximately $29.8 million from the sale of the Warrants. If the market value per share of the Company's common stock, as measured under the Warrants, exceeds the strike price of the Warrants, the Warrants will have a dilutive effect on the Company's earnings per share, unless the Company elects, subject to certain conditions, to settle the Warrants in cash. Taken together, the purchase of the convertible note hedges and the sale of the Warrants are intended to reduce potential dilution from the conversion of the Notes due 2024 and to effectively increase the overall conversion price from $20.5010 to $25.2320 per share. The Warrants are only exercisable on the applicable expiration dates in accordance with the Warrants. Subject to the other terms of the Warrants, the first expiration date applicable to the Warrants is September 1, 2024, and the final expiration date applicable to the Warrants is April 22, 2025. As of December 31, 2019, the Warrants had not been exercised and remained outstanding.

Given that the transactions meet certain accounting criteria, the convertible note hedge transactions and the warrants are recorded in stockholders' equity, and they are not accounted for as derivatives and are not remeasured each reporting period.

Convertible Senior Notes due 2023

In August 2018, the Company sold $65.0 million aggregate principal amount of 4.0% convertible senior notes due 2023 (the “Notes due 2023”) in a private placement. On May 30, 2019, the Company entered into separately and privately negotiated transactions with certain holders of the Notes due 2023 resulting in the repurchase and exchange, as of June 5, 2019, of $60.0 million aggregate principal amount of the notes in consideration for the issuance of 10,801,080 shares of common stock and separate cash payments totaling $6.0 million. As of December 31, 2019, $5.0 million aggregate principal amount of the Notes due 2023 remain outstanding.

The remaining outstanding Notes due 2023 are general unsecured obligations and bear interest at a rate of 4.0% per year, payable semi-annually on February 1 and August 1 of each year. The Notes due 2023 are governed by an indenture between the Company and U.S. Bank National Association, as trustee. The remaining outstanding Notes due 2023 will mature on August 1, 2023, unless earlier repurchased by the Company or converted at the option of the holders. The Company may not redeem the remaining Notes due 2023 prior to the maturity date, and no sinking fund is provided for such notes. The remaining Notes due 2023 are convertible, at a holder’s election, in multiples of $1,000 principal amount, into shares of the Company’s common stock based on the applicable conversion rate. The initial conversion rate for such notes is 180.0180 shares of common stock per $1,000 principal amount of notes (which is equivalent to an initial conversion price of approximately $5.56 per share). The conversion rate and the corresponding conversion price are subject to adjustment upon the occurrence of certain events but will not be adjusted for any accrued and unpaid interest. Holders of the remaining Notes due 2023 who convert their notes in connection with a make-whole fundamental change (as defined in the applicable indenture) are, under certain circumstances, entitled to an increase in the conversion rate. Additionally, in the event of a fundamental change, holders of the remaining Notes due 2023 may require the Company to repurchase all or a portion of their notes at a price equal to 100% of the principal amount of notes, plus any accrued and unpaid interest, including any additional interest to, but excluding, the repurchase date. Holders may convert all or any portion of their Notes due 2023 at their option at any time prior to the close of business on the business day immediately preceding the maturity date, in multiples of $1,000 principal amount.

During the year ended December 31, 2019, the Company recognized $6.0 million inducement cost in other expense, net on the Company’s consolidated statement of operations and reclassed $2.0 million of deferred issuance costs, offset by $0.8 million in accrued interest in additional paid in capital on the Company’s consolidated balance sheet as of December 31, 2019 related to the exchange of $60.0 million aggregate principal amount of the Notes due 2023 consummated by the Company on June 5, 2019.

The following table presents the amount of interest cost recognized relating to the contractual interest coupon and the amortization of debt issuance costs of the Notes due 2023.

	Years Ended December 31,	
	2019	2018
	(In thousands)	
Contractual interest expense	$ 1,226	$ 975
Amortization of debt issuance costs	245	193
Total interest costs recognized	$ 1,471	$ 1,168

Term Loan

In July 2016, the Company entered into a Loan and Security Agreement (the “Original Term Loan Agreement”) with lenders that are affiliates of Tennenbaum Capital Partners, LLC. In February 2017, the Company entered into an Amended and Restated Loan and Security Agreement (the “Loan Agreement”) that amended and restated the Original Term Loan Agreement. The Loan Agreement provided for a $25.0 million secured term loan to the Company (the “New Term Loan”), which is in addition to the $25.0 million secured term loan borrowed by the Company under the Original Term Loan Agreement (together with the “New Term Loan” the “Term Loans”).

On January 28, 2019, the Company repaid in full the remaining principal amount of the Term Loans of approximately $39.5 million plus accrued interest and fees.

Sale of Long-Term Financing Receivables

The Company entered into an agreement with a third party in the fourth quarter of 2017 to sell certain current and future receivables at a discount. In December 2017, the third party made an initial purchase of receivables that resulted in net proceeds to the Company of $2.8 million. This transaction was recorded as debt on the accompanying consolidated balance sheets, and the debt balance was relieved in January 2019 as the underlying receivables were settled. During the year ended December 31, 2018, the third party made three additional purchases of receivables that resulted in total net proceeds to the Company of $5.6 million. These transactions were recorded as debt on the accompanying consolidated balance sheets, and the total associated debt balance will be relieved by September 2021 as the underlying receivables are settled. After the initial purchase, the buyer had the option to purchase certain additional future receivables at various fixed discounts. This option was valued at $0.7 million and was recorded as a liability with a corresponding offset to debt as of December 31, 2017. As of December 31, 2019, all purchases relating to this option had been made, and the liability has been relieved. See Note 9. “Fair Value Measurements,” for additional information.

12. COMMITMENTS AND CONTINGENT LIABILITIES

Operating Leases

The Company leases office facilities under noncancelable operating leases that expire on various dates through 2028, some of which may include options to extend the leases for up to 12 years.

The components of lease expense are presented as follows:

	Year Ended December 31, 2019
	(In thousands)
Operating lease costs	$ 4,041

The components of lease liabilities are presented as follows:

	December 31, 2019
	(In thousands)
Operating lease liabilities, current (Accrued liabilities)	$ 3,170
Operating lease liabilities, noncurrent (Other liabilities)	9,542
Total operating lease liabilities	$ 12,712
Supplemental lease information:	
Weighted average remaining lease term	5.5 years
Weighted average discount rate	8.6%

Supplemental cash flow and other information related to operating leases, are as follows:

	Year Ended December 31, 2019
	(In thousands)
Cash paid for amounts included in the measurement of lease liabilities:	
Operating cash flows from operating leases	$ 3,636
Non-cash investing activities:	
Lease liabilities arising from obtaining right-of-use assets	$ 4,834

Undiscounted cash flows of operating lease liabilities as of December 31, 2019 are as follows:

		Lease Amounts
		(In thousands)
Year:		
2020	$	4,156
2021		4,238
2022		2,927
2023		2,188
2024		921
2025 and thereafter		740
Total lease payments		15,170
Less: imputed lease interest		(2,458)
Total lease liabilities	$	12,712

As previously disclosed in the Company's Annual Report on Form 10-K and under the previous lease accounting standard ASC 840, "Leases," the aggregate future minimum lease payments under the Company's noncancelable operating leases, as of December 31, 2018, are as follows:

		Lease Amounts
		(In thousands)
Year:		
2019	$	3,738
2020		3,532
2021		3,276
2022		1,810
2023		945
Thereafter		1,252
Total		14,553
Sublease income to be recognized in the future under noncancelable subleases		(922)
Net operating lease minimum payments	$	13,631

Purchase Obligations

The Company has contractual obligations related to component inventory that its primary contract manufacturer procures on its behalf in accordance with its production forecast as well as other inventory related purchase commitments. As of December 31, 2019, these purchase obligations totaled approximately $99.5 million.

Letter of Credits

As of December 31, 2019, we had a standby letter of credit in the aggregate amount of $44.7 million, primarily in connection with one of our customer contracts. The letter of credit serves as a performance security for product delivery to the customer in 2020 and will expire April 30, 2020. The Company has collateralized under the letter of credit a certificate of deposit of $44.7 million. No amounts have been drawn against this letter of credit. Further information relating to the letter of credit may be found in Note 3, "Revenue Recognition," of the notes to consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K.

Litigation

From time-to-time, the Company may be involved in litigation relating to claims arising out of its operations. The Company is not currently involved in any material legal proceedings; however, the Company may be involved in material legal proceedings in the future. Such matters are subject to uncertainty and there can be no assurance that such legal proceedings will not have a material effect on its business, results of operations, financial position or cash flows.

13. SALE OF COMMON STOCK

In February 2018, the Company entered into a Securities Purchase Agreement with an investor pursuant to which the Company, in a private placement, issued and sold to the investor 9.5 million shares of the Company's common stock at a price per share of $2.10, for gross proceeds of $20.0 million.

In January 2017, the Company completed a private placement of securities that resulted in the issuance of approximately 10.8 million shares of common stock and gross proceeds of $10.0 million.

14. STOCK-BASED COMPENSATION

Description of Equity Incentive Plans

2006 Plan

Under the Company's 2006 Equity Incentive Plan (the "2006 Plan"), equity awards granted generally vest over a 4-year period from the date of grant with a contractual term of up to 10 years. As of December 31, 2019, there were less than 0.1 million shares of options outstanding under the 2006 Plan. No further stock options or other stock awards may be granted under the 2006 Plan.

2011 Plan

Under the 2011 Equity Incentive Plan (the "2011 Plan"), the Company could initially issue up to 2,643,171 shares of its common stock pursuant to stock options, stock appreciation rights ("SARS"), restricted stock awards ("RSA"), RSUs, PSUs, and other forms of equity compensation, or collectively, stock awards, all of which may be granted to employees, including officers, and to non-employee directors and consultants. Options granted under the 2011 Plan before August 1, 2012 generally expire 10 years after the grant date and options granted thereafter generally expire 7 years after the grant date. Equity awards granted under the 2011 Plan generally vest over a 4-year period from the date of grant based on continued employment. The number of shares of the Company's common stock authorized for issuance under the 2011 Plan automatically increases on each January 1 by 4.5% of the total number of shares of the Company's common stock outstanding on December 31 of the preceding calendar year, or such lesser number of shares of common stock as determined by the board of directors. As of December 31, 2019, 4,355,838 shares remained available for issuance pursuant to future grants under the 2011 Plan. On January 1, 2020, the shares available for issuance under the 2011 Plan automatically increased by 5,539,886 shares.

2011 Employee Stock Purchase Plan

The 2011 Employee Stock Purchase Plan ("ESPP") became effective immediately upon the execution and delivery of the underwriting agreement for the Company's initial public offering on March 29, 2012. The ESPP authorized the issuance of 669,603 shares of the Company's common stock pursuant to purchase rights granted to employees. The number of shares of common stock reserved for issuance will automatically increase, on each January 1, by a lesser of (i) 330,396 shares of the Company's common stock or (ii) 1.0% of the total number of shares of the Company's common stock outstanding on December 31 of the preceding calendar year, as determined by the Company's board of directors. At the Annual Meeting of Stockholders held on May 18, 2017 the Company's stockholders approved a one-time amendment to the Company's ESPP to increase the aggregate number of shares available for purchase by 400,000 shares and to increase the annual automatic minimum increase in shares reserved for issuance from 330,396 to 700,000 shares effective January 1, 2018. As of December 31, 2019, 936,020 shares remained available for future issuance under the ESPP. On January 1, 2020, the shares available for issuance under the ESPP automatically increased by 700,000 shares.

The ESPP is implemented by concurrent offering periods and each offering period may contain up to four interim purchase periods. In general, offering periods consists of the 24-month periods commencing on each May 15 and November 15 of a calendar year.

Generally, all full-time employees, including executive officers, are eligible to participate in the ESPP. The ESPP permits eligible employees to purchase the Company's common stock through payroll deductions, which may not exceed 15% of the employee's total compensation subject to certain limits. Stock may be purchased under the plan at a price equal to 85% of the fair market value of the Company's stock on either the date of purchase or the first day of an offering period, whichever is lower. A two-year look-back feature in the Company's ESPP causes an offering period to reset if the fair value of the Company's common stock on a purchase date is less than that on the initial offering date for that offering period. The reset feature, when triggered, will be accounted for as a modification to the original offering, resulting in additional expense to be recognized over the 24-month period of the new offering. During any calendar year, participants may not purchase shares of common stock having a value greater than $25,000, based on the fair market value per share of the common stock at the beginning of an offering period.

Valuation of Equity Awards

Stock Options

The fair value of each option granted was estimated on the date of grant using the Black-Scholes option-pricing model with the following assumptions:

- *Expected term*—The expected term of the option awards represents the period of time between the grant date of the option awards and the date the option awards are either exercised, converted or canceled, including an estimate for those option awards still outstanding. The Company used the simplified method, as permitted by the SEC for companies with a limited history of stock option exercise activity, to determine the expected term for its option grants.
- *Expected volatility*—The expected volatility was calculated based on the Company's historical stock prices, supplemented as necessary with historical volatility of the common stock of several peer companies with characteristics similar to those of the Company.
- *Risk-free interest rate*—The risk-free interest rate was based on the U.S. Treasury yield curve in effect at the time of grant and with a maturity that approximated the Company's expected term.
- *Dividend yield*—The dividend yield was based on the Company's dividend history and the anticipated dividend payout over its expected term.

The following table presents the weighted-average grant date fair value of options granted for the periods presented and the assumptions used to estimate those values using a Black-Scholes option pricing model.

	Years Ended December 31,		
	2019	2018	2017
Weighted average grant date fair value	$ 9.16	$ 2.83	$ 0.76
Expected term (in years)	3.8	4.0	4.4
Expected volatility	89.1%	88.5%	83.9%
Annual risk-free rate of return	2.1%	2.6%	1.8%
Dividend yield	—%	—%	—%

Restricted Stock Units

The fair value of the Company's restricted stock units ("RSU") awards granted is based upon the closing price of the Company's stock price on the date of grant.

Performance Stock Units

The fair value of the Company's non-market performance stock units ("PSU") awards granted was based upon the closing price of the Company's stock price on the date of grant. The fair value of awards of the Company's PSU awards containing market conditions was determined using a Monte Carlo simulation model based upon the terms of the conditions, the expected volatility of the underlying security, and other relevant factors.

Stock-based Compensation Expense

Stock-based compensation expense for all stock-based awards expected to vest is measured at fair value on the date of grant and recognized ratably over the requisite service period. The following table summarizes the components of total stock-based compensation expense included in the consolidated statements of operations for the periods presented.

	Years Ended December 31,		
	2019	2018	2017
		(In thousands)	
Cost of revenues	$ 1,650	$ 1,071	$ 1,072
Research and development	4,897	2,940	2,573
Sales and marketing	5,678	3,074	1,157
General and administrative	7,216	4,347	1,925
Restructuring	735	—	—
Total	$ 20,176	$ 11,432	$ 6,727

The following table summarizes the various types of stock-based compensation expense for the periods presented.

	Years Ended December 31,		
	2019	2018	2017
		(In thousands)	
Stock options, RSUs, and PSUs	$ 19,216	$ 10,691	$ 5,559
Employee stock purchase plan	960	741	1,168
Total	$ 20,176	$ 11,432	$ 6,727

As of December 31, 2019, there was approximately $31.5 million of total unrecognized stock-based compensation expense related to unvested equity awards, which are expected to be recognized over a weighted-average period of 2.3 years.

Equity Awards Activity

Stock Options

The following is a summary of stock option activity.

	Number of Shares Outstanding	Weighted-Average Exercise Price per Share	Weighted-Average Remaining Contractual Term	Aggregate Intrinsic Value (1)
	(In thousands)		*(Years)*	*(In thousands)*
Outstanding at December 31, 2016	8,730	$ 4.55		
Granted	4,500	1.22		
Exercised	(425)	0.51		$ 544
Canceled	(4,379)	6.91		
Outstanding at December 31, 2017	8,426	$ 1.77		
Granted	213	4.43		
Exercised	(1,346)	1.75		5,096
Canceled	(521)	2.94		
Outstanding at December 31, 2018	6,772	$ 1.76		
Granted	43	14.58		
Exercised	(2,616)	1.22		31,093
Canceled	(102)	4.07		
Outstanding at December 31, 2019	4,097	$ 2.18	4.3	$ 98,103
Vested and expected to vest at December 31, 2019	4,097	$ 2.18	4.3	$ 98,103
Exercisable at December 31, 2019	2,887	$ 2.44	4.1	$ 68,397

(1) The intrinsic value of options exercised is based upon the value of the Company's stock at exercise. The intrinsic value of options outstanding, vested and expected to vest, and exercisable as of December 31, 2019 is based on the closing price of the Company's stock fair value on December 31, 2019 or the earlier of the last trading day prior to December 31, 2019, if December 31, 2019 is a non-trading day. The Company's stock fair value used in this computation was $26.13 per share.

The following table summarizes information about stock options outstanding at December 31, 2019.

	Options Outstanding			Options Exercisable	
Range of Exercise Prices	Number of Shares	Weighted-Average Remaining Life	Weighted-Average Exercise Price	Number of Shares	Weighted-Average Exercise Price
	(In thousands)	*(Years)*		*(In thousands)*	
$0.64 — $1.11	774	5.0	$ 0.82	518	$ 0.78
$1.29 — $1.29	1,000	4.7	1.29	563	1.29
$1.31 — $1.31	1,309	4.3	1.31	975	1.31
$1.37 — $7.50	867	3.2	4.18	702	4.57
$7.68 — $14.58	147	3.4	11.45	129	11.02
Total	4,097	4.3	$ 2.18	2,887	$ 2.44

Restricted Stock Units

The following is a summary of RSU activity.

	Number of Shares Outstanding	Weighted-Average Fair Value per Share at Grant Date	Weighted-Average Remaining Contractual Term	Aggregate Intrinsic Value (1)
	(In thousands)		*(Years)*	*(In thousands)*
Outstanding at December 31, 2016	606	$ 9.33		
Granted	5,418	1.46		
Vested	(885)	3.81		$ 932
Canceled	(1,634)	1.90		
Outstanding at December 31, 2017	3,505	$ 2.03		
Granted	3,152	4.45		
Vested	(1,399)	2.75		6,657
Canceled	(906)	2.17		
Outstanding at December 31, 2018	4,352	$ 3.52		
Granted	2,112	11.50		
Vested	(1,707)	3.87		27,156
Canceled	(494)	4.81		
Outstanding at December 31, 2019	4,263	$ 7.19	1.3	$ 111,387
Expected to vest at December 31, 2019	4,263	$ 7.19	1.3	$ 111,387

(1) The intrinsic value of RSUs vested is based upon the value of the Company's stock when vested. The intrinsic value of RSUs outstanding and expected to vest as of December 31, 2019 is based on the closing price of the Company's stock on December 31, 2019 or the earlier of the last trading day prior to December 31, 2019, if December 31, 2019 is a non-trading day. The Company's stock fair value used in this computation was $26.13 per share.

On April 3, 2017, the Company commenced a Tender Offer (the "Offer") to exchange out of the money stock options for RSUs. The Offer expired on May 1, 2017. Pursuant to the Offer, the Company accepted elections to exchange options to purchase 2,362,470 shares of common stock and issued replacement awards of RSUs for 733,559 shares of common stock. As the transaction approximated a value-for-value exchange, it did not have a material impact on the Company's stock-based compensation expense.

Performance Stock Units

The following is a summary of PSU activity.

	Number of Shares Outstanding	Weighted-Average Fair Value per Share at Grant Date	Weighted-Average Remaining Contractual Term	Aggregate Intrinsic Value (1)
	(In thousands)		(Years)	(In thousands)
Outstanding at December 31, 2017	—			
Granted	1,477	$ 4.65		
Vested	—			
Canceled	(147)			
Outstanding at December 31, 2018	1,330	$ 4.66		
Granted	1,052	9.48		
Vested	(1,063)	4.62		$ 10,818
Canceled	(364)	5.16		
Outstanding at December 31, 2019	955	$ 9.83	0.2	$ 24,952

(1) The intrinsic value of PSUs vested is based upon the value of the Company's stock when vested. The intrinsic value of PSUs outstanding and expected to vest as of December 31, 2019 is based on the closing price of the Company's stock on December 31, 2019 or the earlier of the last trading day prior to December 31, 2019, if December 31, 2019 is a non-trading day. The Company's stock fair value used in this computation was $26.13 per share.

Stock-based compensation expense is measured at the grant date based on the fair value of the award. During the first quarter of 2019 the Company issued PSU grants of 1.0 million shares, of which 0.5 million shares include market conditions. Each grantee is granted a target award of PSUs and may earn between 0% and 200% of the target award depending on the Company's performance against the performance goals. The grant date fair value of PSUs without market conditions is recognized as expense when the performance condition is probable of being achieved, and then on a graded basis over the requisite service period. The grant date fair value of PSUs with market conditions is recognized as expense on a straight-line basis over the requisite service period. The weighted average estimated fair value of the PSUs without market conditions was $8.80 per share, and the weighted average estimated fair value of the PSUs with market conditions, based on the Monte Carlo model, was $10.70 per share.

Employee Stock Purchase Plan

A summary of ESPP activity for the years presented is as follows: (in thousands, except per share data):

	Years Ended December 31,		
	2019	2018	2017
Proceeds from common stock issued under ESPP	$ 1,692	$ 397	$ 313
Shares of common stock issued	315	439	478
Weighted-average price per share	$ 5.37	$ 0.90	$ 0.65

15. INCOME TAXES

The domestic and foreign components of income (loss) before income taxes consisted of the following:

	Years Ended December 31,		
	2019	2018	2017
		(In thousands)	
United States	$ 85,520	$ (14,322)	$ (47,882)
Foreign	4,594	4,093	2,541
Income (loss) before income taxes	$ 90,114	$ (10,229)	$ (45,341)

The income taxes (benefit) provision for the years presented is as follows:

	Years Ended December 31,		
	2019	2018	2017
		(In thousands)	
Current:			
Federal	$ —	$ —	$ —
State	327	42	21
Foreign	1,589	1,233	1,224
	1,916	1,275	1,245
Deferred:			
Federal	(56,959)	(35)	(1,092)
State	(17,458)	(21)	(21)
Foreign	1,467	179	(281)
	(72,950)	123	(1,394)
Income taxes (benefit) provision	$ (71,034)	$ 1,398	$ (149)

A reconciliation of the income tax (benefit) provision and the amount computed by applying the statutory federal income tax rate of 21% in 2019 and 2018 and 34% in 2017 to income (loss) before income taxes for the years presented is as follows:

	Years Ended December 31,		
	2019	2018	2017
		(In thousands)	
Income tax (benefit) provision at statutory federal rate	$ 18,929	$ (2,148)	$ (15,416)
State taxes, net of federal benefit	(17,197)	17	(64)
Change in valuation allowance	(71,300)	8,198	(20,571)
Foreign tax rate and tax law differential	1,206	313	(133)
Tax credits	(1,803)	(378)	(382)
Stock-based compensation	(8,072)	(953)	761
Other permanent items	31	235	479
Other nondeductible/nontaxable items	2,765	(5,112)	930
Uncertain tax positions	504	107	106
Tax law changes	—	—	34,141
GILTI	1,086	917	—
Section 162(m)	2,817	202	—
Income tax (benefit) provision	$ (71,034)	$ 1,398	$ (149)

A summary of significant components of the Company's deferred tax assets and liabilities as of December 31, 2019 and 2018 is as follows (in thousands):

	December 31, 2019	December 31, 2018
Deferred tax assets:		
Allowances and reserves	$ 10,726	$ 10,022
Net operating loss and tax credit carryforwards	54,369	71,568
Stock-based compensation	3,753	3,662
Deferred revenue	16,736	19,562
Fixed assets and intangibles	2,720	3,836
Sec. 163(j) interest carryforward	—	2,064
Other	1,109	2,084
Subtotal	89,413	112,798
Less valuation allowance	—	(98,631)
Total deferred tax assets, net of valuation allowance	89,413	14,167
Deferred tax liabilities:		
Goodwill	(1,368)	(1,070)
Unremitted foreign earnings	(5)	(16)
Deferred cost of goods sold	(14,374)	(12,655)
Total deferred tax liabilities	(15,747)	(13,741)
Net deferred tax asset	$ 73,666	$ 426

The Company's accounting for deferred taxes involves the evaluation of a number of factors concerning the realizability of the Company's deferred tax assets. Assessing the realizability of deferred tax assets is dependent upon several factors, including the likelihood and amount, if any, of future taxable income in relevant jurisdictions during the periods in which those temporary differences become deductible. The Company's management forecasts taxable income by considering all available positive and negative evidence including its history of operating income or losses and its financial plans and estimates which are used to manage the business. These assumptions require significant judgment about future taxable income. The amount of deferred tax assets considered realizable is subject to adjustment in future periods if estimates of future taxable income are reduced.

In the fourth quarter of fiscal year 2019, the Company's management determined, based on the Company's recent history of earnings coupled with its forecasted profitability, that it is more likely than not that all of deferred tax assets will be realized in the foreseeable future. Accordingly, in the fourth quarter of fiscal year 2019, the Company released $92.9 million of the valuation allowance on its deferred tax assets, related to its federal and state deferred tax assets.

The Company has net operating loss carryforwards for federal and California income tax purposes of approximately $147.4 million and $78.9 million, respectively, as of December 31, 2019. The federal and state net operating loss carryforwards, if not utilized, will expire beginning in 2028.

The Company has approximately $12.4 million of federal research credit and $11.3 million of state research credit carryforwards. The federal credits begin to expire in 2026 and the state credits can be carried forward indefinitely.

Utilization of some of the federal and state net operating loss and credit carryforwards are subject to annual limitations due to the "change in ownership" provisions of the Internal Revenue Code of 1986 and similar state provisions. The Company has completed a Section 382 analysis through December 31, 2019, which indicated no such change has occurred through December 31, 2019.

The accounting for uncertain tax positions prescribes a recognition threshold and measurement attribute for the financial statement recognition and measurement of a tax position taken or expected to be taken in a tax return. The Company is required to recognize in the financial statements the impact of a tax position, if that position is more-likely-than-not of being sustained on audit, based on the technical merits of the position. The Company recorded a net charge for unrecognized tax benefits in 2019 of $0.3 million.

The Company does not have any tax positions for which it is reasonably possible the total amount of gross unrecognized tax benefits will increase or decrease over the next year. The unrecognized tax benefits may increase or change during the next year for items that arise in the ordinary course of business.

A tabular reconciliation of the total amounts of unrecognized tax benefits for the years presented is as follows (in thousands):

	Years Ended December 31, 2019	2018	2017
Unrecognized tax benefits—at beginning of year	$ 6,325	$ 6,106	$ 6,016
Decreases in balances related to tax positions taken in prior years	(370)	—	(135)
Increases in balances related to tax positions taken in current year	771	329	306
Lapses in statutes of limitations	(137)	(110)	(81)
Unrecognized tax benefits—at end of year	$ 6,589	$ 6,325	$ 6,106

The Company includes interest and penalties related to unrecognized tax benefits within the benefit from (provision for) income taxes. As of years ended December 31, 2019 and 2018, the total amount of gross interest and penalties accrued in each year was immaterial. Both the unrecognized tax benefits and the associated interest and penalties that are not expected to result in payment or receipt of cash within one year are classified as other non-current liabilities in the consolidated balance sheets. In connection with tax matters, the Company's interest and penalty expense recognized in 2019, 2018 and 2017 in the consolidated statements of operations was immaterial.

The Company's tax returns continue to remain effectively subject to examination by U.S. federal authorities for the years 2006 through 2019 and by California state authorities for the years 2006 through 2019 due to use and carryovers of net operating losses and credits.

16. CONCENTRATION OF CREDIT RISK AND MAJOR CUSTOMERS

The Company is potentially subject to financial instrument concentration of credit risk through its cash and cash equivalents and accounts receivable. The Company places its cash and cash equivalents with high quality institutions and performs periodic evaluations of their relative credit standing.

Accounts receivable can be potentially exposed to a concentration of credit risk with its major customers. As of December 31, 2019, amounts due from three customers represented approximately 34%, 14% and 11% of the total accounts receivable balance. As of December 31, 2018, amounts due from two customers represented 22% and 13% of the total accounts receivable balance.

In 2019, two customers accounted for approximately 21% and 12% of total net revenues. In 2018, one customer accounted for approximately 19% of total net revenues. In 2017, two customers accounted for approximately 15% and 11% of total net revenues.

17. NET INCOME (LOSS) PER SHARE

Basic net income (loss) per share is computed by dividing net income (loss) by the weighted average number of shares of common stock outstanding during the period. Diluted net income (loss) per share is computed in a similar manner, but it also includes the effect of potential common shares outstanding during the period, when dilutive. Potential common shares include Stock Options, RSUs, PSUs, shares to be purchased under the Company's ESPP, the Notes due 2023, the Notes due 2024 and warrants issued in conjunction with the Notes due 2024. The dilutive effect of potentially dilutive common shares is reflected in diluted earnings per share by application of the treasury stock method for stock options, RSUs, PSUs, warrants, Notes due 2024 and shares to be purchased under the ESPP, and by application of the if-converted method for the Notes due 2023. To the extent these potential common shares are antidilutive, they are excluded from the calculation of diluted net income (loss) per share.

The following table presents the computation of basic and diluted net income (loss) per share for the periods presented.

	Years Ended December 31,		
	2019	2018	2017
	(In thousands, except per share data)		
Numerator:			
Net income (loss)	$ 161,148	$ (11,627)	$ (45,192)
Notes due 2023 interest and financing costs, net	1,088	—	—
Adjusted net income (loss)	$ 162,236	$ (11,627)	$ (45,192)
Denominator:			
Shares used in basic per share amounts:			
Weighted average common shares outstanding	116,713	99,619	82,939
Shares used in diluted per share amounts:			
Weighted average common shares outstanding	116,713	99,619	82,939
Effect of dilutive securities:			
Employee stock-based awards	8,964	—	—
Warrants	—	—	—
Notes due 2024	451	—	—
Notes due 2023	5,516	—	—
Weighted average common shares outstanding for diluted calculation	131,644	99,619	82,939
Basic and diluted net income (loss) per share			
Net income (loss) per share, basic	$ 1.38	$ (0.12)	$ (0.54)
Net income (loss) per share, diluted	$ 1.23	$ (0.12)	$ (0.54)

The following outstanding shares of common stock equivalents were excluded from the calculation of the diluted net income (loss) per share attributable to common stockholders because their effect would have been antidilutive.

	Years Ended December 31,		
	2019	2018	2017
	(In thousands)		
Employee stock options	27	7,710	8,433
RSUs and PSUs	158	5,273	3,029
Warrants to purchase common stock	300	—	1,083
Notes due 2023	—	11,701	—
Total	485	24,684	12,545

Diluted earnings per shares for the year ended December 31, 2019 includes the dilutive effect of stock options, RSUs, PSUs, and shares to be purchased under the ESPP, the Notes due 2023 and Notes due 2024. Certain common stock issuable under stock options, RSUs, PSUs and warrants issued in conjunction with the Notes due 2024 have been omitted from the diluted net income per share calculation because including such shares would have been antidilutive.

Since the Company has the intent and ability to settle the aggregate principal amount of the Notes due 2024 in cash and any excess in shares of the Company's common stock, the Company uses the treasury stock method for calculating any potential dilutive effect of the conversion spread on diluted net income per share, if applicable. In order to compute the dilutive effect, the number of shares included in the denominator of diluted net income per share is determined by dividing the conversion spread value of the "in-the-money" Notes due 2024 by the Company's average share price during the period and including the resulting share amount in the diluted net income per share denominator. The conversion spread will have a dilutive impact on net income per share of common stock when the average market price of the Company's common stock for a given period exceeds the conversion price of $20.5010 per share for the Notes due 2024. The Company's weighted average common stock price since the issuance of the Notes due 2024 was above the conversion price, resulting in an impact on the diluted net income per share.

Diluted earnings per shares for the years ended December 31, 2018 and 2017, excludes potential common stock issuable under stock options, RSUs, PSUs, and shares to be purchased under the ESPP and the Notes due 2023, as the Company incurred a net loss during these periods and including such shares would have been antidilutive.

18. SEGMENT AND GEOGRAPHIC INFORMATION

The Company's chief operating decision maker is the Chief Executive Officer. The Chief Executive Officer reviews financial information presented on a consolidated basis. The Company has one business activity, which entails the design, development, manufacture and sale of solutions for the solar photovoltaic industry. There are no segment managers who are held accountable for operations, operating results or plans for levels or components below the consolidated unit level. Accordingly, management has determined that the Company has a single operating and reportable segment.

The following tables present net revenues (based on the destination of shipments) and long-lived assets by geographic region as of and for the periods presented (in thousands):

Net Revenues

	Years Ended December 31,		
	2019	2018	2017
	(In thousands)		
United States	$ 523,577	$ 219,600	$ 199,565
International	100,756	96,559	86,601
Total	$ 624,333	$ 316,159	$ 286,166

Long-Lived Assets

	December 31,	
	2019	2018
	(In thousands)	
United States	$ 16,754	$ 13,146
China	4,635	5,504
Mexico	3,510	—
Other	4,037	2,348
Total	$ 28,936	$ 20,998

19. RELATED PARTY

The Company sells products to SunPower under the August 2018 MSA. As of December 31, 2019 and 2018, SunPower via its wholly owned subsidiary, held 6.5 million shares and 7.5 million shares, respectively, of the Company's common stock. Revenue recognized under the MSA for the years ended December 31, 2019 and 2018 was $70.9 million and $12.4 million, respectively, net of amortization of the customer relationship intangible asset (see Note 6. "Goodwill and Intangible Assets"). As of December 31, 2019 and 2018, the Company had accounts receivable of $15.9 million and $10.3 million, respectively, from SunPower. As of December 31, 2019, the Company received $5.2 million as a safe harbor prepayment from SunPower in the fourth quarter of 2019 for product delivered in the first quarter of 2020.

In 2018, a member of the Company's board of directors and one of its principal stockholders, Thurman John Rodgers, purchased $5.0 million aggregate principal amount of the Notes due 2023 in a concurrent private placement. As of both December 31, 2019 and December 31, 2018, $5.0 million aggregate principal amount of the Notes due 2023 were outstanding. See Note 11. "Debt" for additional information related to this purchase.

20. ACQUISITION

On August 9, 2018, the Company completed its acquisition of SunPower's microinverter business pursuant to an APA by which the Company acquired certain assets and liabilities of SunPower relating to the research and development and manufacturing of microinverters. The acquisition was accounted for as a business combination and, accordingly, the total purchase price was allocated to the preliminary net tangible and intangible assets and liabilities based on their preliminary fair values on the acquisition date.

In conjunction with the APA, the Company entered into an MSA with SunPower. Pursuant to the terms of the MSA, the Company becomes the exclusive supplier of MLPEs for SunPower's residential business in the U.S. for a period of five years. The resulting customer relationship intangible is accounted for as a distinct transaction from the acquired business.

The acquisition date fair value of the consideration transferred was approximately $57.3 million, which consisted of the following (in thousands):

Cash consideration	$	25,000
Common stock issued		32,319
Total	$	57,319

The fair value of the Company's 7.5 million shares of common stock issued, valued at $32.3 million, was determined based on the closing market price of the Company's common stock on the acquisition date, less a discount of 14% to 30% (depending on the year) for lack of marketability as the shares issued are subject to a restriction that limits their trade or transfer with a lock-up period of six months and restrictions on the number of shares that can be transferred by SunPower in each six-month period following the lock-up period.

The following table summarizes the preliminary estimated fair values of the assets acquired and liabilities assumed at the acquisition date (in thousands):

Intangible assets	$	36,200
Goodwill		21,119
Net assets acquired	$	57,319

The excess of the consideration paid over the fair values assigned to the assets acquired and liabilities assumed represents the goodwill resulting from the acquisition. The $21.1 million of goodwill recognized is attributable primarily to the benefits the Company expects to derive from enhanced scale and efficiency to better serve its markets. Goodwill is expected to be deductible over the next 15 years for income tax purposes.

The fair values assigned to tangible and identifiable intangible assets acquired are based on management's estimates and assumptions. The fair values of assets acquired are preliminary and may be subject to change within the measurement period as the fair value assessments are finalized.

The following table shows the fair value of the separately identifiable intangible assets at the time of acquisition and the period over which each intangible asset will be amortized:

	Preliminary Fair Value	Useful Life
	(In thousands)	*(Years)*
Developed technology	$ 13,100	6
Customer relationship	23,100	9
Total identifiable intangible assets	$ 36,200	

The developed technology acquired is embedded in the microinverters that SunPower sells to its customers. The Company already has developed microinverter technology and the Company will supply its microinverters to SunPower through the term of the MSA. The Company does not intend to actively use the developed technology acquired from SunPower but does plan to hold the developed technology to prevent others from using it. Therefore, the Company will account for the developed technology as a defensive intangible asset. The Company expects to realize the benefits of the developed technology over the period of time in which the Company will supply microinverters to SunPower. The Company does expect changes in microinverter technology during the life of the customer relationship with SunPower and expects to benefit from preventing competitors' access to the technology over a period of six years, therefore, the Company will amortize the value of the developed technology intangible asset over a period of six years.

The MSA was negotiated together with the APA and provides the Company with the exclusive right to supply SunPower with MLPEs for a period of five years, with options for renewals. The exclusivity arrangement extends throughout the term of the MSA, which comprises all of the expected cash flows from the customer relationship intangible asset, and was a condition to, and was an essential part of the acquisition of the microinverter business by the Company. As the fair value ascribed to the customer relationship intangible asset represents payments to a customer, the Company will amortize the value of the customer relationship intangible asset as a reduction to revenue using a pattern of economic benefit method over a useful life of nine years.

The table below shows estimated fair values of the assets acquired funded by cash and issuance of common stock at the acquisition date:

	Cash Purchase Price	Issuance of Common Stock	Total Consideration	% of Total Consideration
		(In thousands)		
Developed technology and goodwill	$ 15,000	$ 19,219	$ 34,219	60%
Customer relationship	10,000	13,100	23,100	40%
Total consideration	$ 25,000	$ 32,319	$ 57,319	100%

The Company allocated $10.0 million of the $25.0 million paid of the cash purchase price to cash flows from operating activities and the remaining $15.0 million to cash used in investing activities in the consolidated statements of cash flows for the year ended December 31, 2018. The allocation was based on the valuation of the customer relationship relative to the overall consideration. In addition, the Company disclosed $19.2 million from issuance of common stock and $15.0 million of cash purchase price paid for the developed technology and goodwill as investing activities in the consolidated statements of cash flows for the year ended December 31, 2018.

During 2018, total acquisition-related costs were approximately $0.8 million, which were included in general and administrative expenses.

The Company determined it is impractical to include such pro forma information given the difficulty in obtaining the historical financial information for the SunPower microinverter business as the business was part of SunPower and did not have discrete financial information prior to the acquisition. Inclusion of such information would require the Company to make estimates and assumptions regarding the acquired business historical financial results that the Company believes may ultimately prove inaccurate.

SELECTED UNAUDITED QUARTERLY FINANCIAL INFORMATION

The following tables show a summary of the Company's quarterly financial information for each of the four quarters of 2019 and 2018 (in thousands, except per share data):

	Three Months Ended			
	March 31, 2019	June 30, 2019	September 30, 2019	December 31, 2019
Net revenues	$ 100,150	$ 134,094	$ 180,057	$ 210,032
Cost of revenues	66,811	88,775	115,351	132,151
Gross profit	33,339	45,319	64,706	77,881
Operating expenses:				
Research and development	8,524	9,604	11,085	11,168
Sales and marketing	7,433	9,054	9,551	10,690
General and administrative	9,880	8,583	9,895	10,450
Restructuring charges	368	631	469	1,131
Total operating expenses	26,205	27,872	31,000	33,439
Income from operations	7,134	17,447	33,706	44,442
Other expense, net				
Interest Income	211	593	894	815
Interest expense	(3,751)	(1,351)	(2,286)	(2,303)
Other income (expense)	(481)	(5,480)	(943)	1,467
Total other expense, net	(4,021)	(6,238)	(2,335)	(21)
Income before income taxes	3,113	11,209	31,371	44,421
Income tax benefit (provision)	(348)	(591)	(272)	72,245
Net income	$ 2,765	$ 10,618	$ 31,099	$ 116,666
Net income per share, basic	$ 0.03	$ 0.09	$ 0.25	$ 0.95
Net income per share, diluted	$ 0.02	$ 0.08	$ 0.23	$ 0.88

	Three Months Ended			
	March 31, 2018	June 30, 2018	September 30, 2018	December 31, 2018
Net revenues	$ 69,972	$ 75,896	$ 78,002	$ 92,289
Cost of revenues	51,657	53,195	52,738	64,124
Gross profit	18,315	22,701	25,264	28,165
Operating expenses:				
Research and development	7,620	9,462	8,165	7,340
Sales and marketing	6,227	6,828	7,375	6,617
General and administrative	6,943	6,969	7,510	7,664
Restructuring charges	—	—	2,588	1,541
Total operating expenses	20,790	23,259	25,638	23,162
Income (loss) from operations	(2,475)	(558)	(374)	5,003
Other expense, net				
Interest income	93	154	321	490
Interest expense	(2,385)	(2,423)	(2,790)	(3,095)
Other expense, net	(126)	(572)	(379)	(1,113)
Total other expense, net	(2,418)	(2,841)	(2,848)	(3,718)
Income (loss) before income taxes	(4,893)	(3,399)	(3,222)	1,285
Provision for income taxes	(235)	(339)	(248)	(576)
Net income (loss)	$ (5,128)	$ (3,738)	$ (3,470)	$ 709
Net income (loss) per share, basic	$ (0.06)	$ (0.04)	$ (0.03)	$ 0.01
Net income (loss) per diluted share	$ (0.06)	$ (0.04)	$ (0.03)	$ 0.01

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 carried out an evaluation required by the Exchange Act, under the supervision and with the participation of our principal executive officer and principal financial officer, of the effectiveness of the design and operation of our disclosure controls and procedures, as defined in Rule 13a-15(e) of the Exchange Act, as of the end of the period covered by this report. Based on this evaluation, our principal executive officer and principal financial officer concluded that our disclosure controls and procedures were effective to provide reasonable assurance that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms and to provide reasonable assurance that such information is accumulated and communicated to our management, including our principal executive officer and principal financial officer, as appropriate to allow timely decisions regarding required disclosures.

Management's Report on Internal Control over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting in providing reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles, as defined in Rule 13a-15(f) of the Exchange Act. Management has assessed the effectiveness of our internal control over financial reporting as of December 2019 based on criteria set forth in Internal Control – Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013). As a result of this assessment, management concluded that, as of December 2019, our internal control over financial reporting was effective. The Company's independent registered public accounting firm, Deloitte & Touche LLP, has issued an audit report on our internal control over financial reporting, which appears in Part II, Item 8 of this Annual Report on Form 10-K.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting that occurred during the most recent quarter ended December 2019 that materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Limitations on Controls

Our disclosure controls and procedures and internal control over financial reporting are designed to provide reasonable assurance of achieving their objectives as specified above. Management does not expect, however, that our disclosure controls and procedures or our internal control over financial reporting will prevent or detect all errors and fraud. Any control system, no matter how well designed and operated, is based upon certain assumptions and can provide only reasonable, not absolute, assurance that its objectives will be met. Further, no evaluation of controls can provide absolute assurance that misstatements due to error or fraud will not occur or that all control issues and instances of fraud, if any, within the Company have been detected.

Item 9B. Other Information

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

The information required regarding our directors is incorporated by reference from the information contained in the section entitled “Proposal 1-Election of Directors” in our definitive Proxy Statement for the 2020 Annual Meeting of Stockholders (our “Proxy Statement”), a copy of which will be filed with the Securities and Exchange Commission on or before April 30, 2020.

The information required regarding our executive officers is incorporated by reference from the information contained in the section entitled “Management” in our Proxy Statement.

The information required regarding Section 16(a) beneficial ownership reporting compliance is incorporated by reference from the information contained in the section entitled “Delinquent Section 16(a) Reports” in our Proxy Statement.

The information required with respect to procedures by which security holders may recommend nominees to our board of directors, and the composition of our Audit Committee, and whether we have an “audit committee financial expert,” is incorporated by reference from the information contained in the section entitled “Information Regarding the Board of Directors and Corporate Governance” in our Proxy Statement.

Code of Conduct

We have a written code of conduct that applies to all our executive officers, directors and employees. Our Code of Conduct is available on our website at *http://investor.enphase.com/corporate-governance*. A copy of our Code of Conduct may also be obtained free of charge by writing to our Secretary, Enphase Energy, Inc., 47281 Bayside Parkway, Fremont, CA 94538. If we make any substantive amendments to our Code of Conduct or grant any waiver from a provision of the Code of Conduct to any executive officer or director, we intend to promptly disclose the nature of the amendment or waiver on our website.

Item 11. Executive Compensation

The information required regarding the compensation of our directors and executive officers is incorporated by reference from the information contained in the sections entitled “Executive Compensation,” “Director Compensation” and “Compensation Committee Interlocks and Insider Participation” in our Proxy Statement.

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

The information required regarding security ownership of our 5% or greater stockholders and of our directors and executive officers is incorporated by reference from the information contained in the section entitled “Security Ownership of Certain Beneficial Owners and Management” in our Proxy Statement.

Equity Compensation Plan Information

The information required regarding securities authorized for issuance under our equity compensation plans is incorporated by reference from the information contained in the section entitled “Equity Compensation Plan Information” in our Proxy Statement.

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

The information required regarding related transactions is incorporated herein by reference from the information contained in the section entitled “Transactions With Related Persons” and, with respect to director independence, the section entitled “Proposal 1-Election of Directors” in our Proxy Statement.

Item 14. Principal Accounting Fees and Services

The information required is incorporated by reference from the information contained in the sections entitled “Principal Accountant Fees and Services” and “Pre-Approval Policies and Procedures” in the section entitled “Proposal 3-Ratification of Selection of Independent Registered Public Accounting Firm” in our Proxy Statement.

PART IV

Item 15. Exhibits, Financial Statement Schedules

Consolidated Financial Statements

The information concerning our consolidated financial statements, and Report of Independent Registered Public Accounting Firm required by this Item is incorporated by reference herein to the section of this Annual Report on Form 10-K in Part II, Item 8, *Consolidated Financial Statements and Supplementary Data*.

No schedules are provided because they are not applicable, not required under the instructions, or the requested information is shown in the financial statements or related notes thereto.

Exhibits

		Incorporation by Reference				
Exhibit Number	**Exhibit Description**	**Form**	**SEC File No.**	**Exhibit**	**Filing Date**	**Filed Herewith**
2.1	Asset Purchase Agreement Among SunPower Corporation and Enphase Energy, Inc. dated June 12, 2018.	8-K	001-35480	2.1	6/12/2018	
3.1	Amended and Restated Certificate of Incorporation of Enphase Energy, Inc.	8-K	001-35480	3.1	4/6/2012	
3.2	Certificate of Amendment of the Amended and Restated Certificate of Incorporation of Enphase Energy, Inc.	10-Q	001-35480	3.1	8/9/2017	
3.3	Certificate of Amendment of the Amended and Restated Certificate of Incorporation of Enphase Energy, Inc.	10-Q	001-35480	2.1	8/6/2018	
3.4	Amended and Restated Bylaws of Enphase Energy, Inc.	S-1/A	333-174925	3.5	3/12/2012	
4.1	Specimen Common Stock Certificate of Enphase Energy, Inc.	S-1/A	333-174925	4.1	3/12/2012	
4.2	Indenture, dated August 17, 2018, between Enphase Energy, Inc. and U.S. Bank National Association.	8-K	001-35480	4.1	8/17/2018	
4.3	Form of 4.00% Convertible Senior Note due 2023 (included in Exhibit 4.2).	8-K	001-35480	4.1	8/17/2018	
4.4	Indenture, dated June 5, 2019, between Enphase Energy, Inc. and U.S. Bank National Association.	8-K	001-35480	4.1	6/5/2019	
4.5	Form of 1.00% Convertible Senior Note due 2024 (included in Exhibit 4.4).	8-K	001-35480	4.1	6/5/2019	
4.6	Description of Registrant's Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934.					X
10.1+	Form of Indemnification Agreement by and between Enphase Energy, Inc. and each of its directors and officers.	S-1/A	333-174925	10.1	8/24/2011	
10.2+	2006 Equity Incentive Plan, as amended, and related documents.	S-8	333-181382	99.1	5/14/2012	
10.3+	2011 Equity Incentive Plan, as amended, and forms of agreement thereunder.	DEF 14A	001-35480	Appendix A	3/18/2016	
10.4+	2011 Employee Stock Purchase Plan, as amended.	DEF 14A	001-35480	Appendix A	3/31/2017	

Exhibit Number	Exhibit Description	Form	Incorporation by Reference			Filed Herewith
			SEC File No.	Exhibit	Filing Date	
10.5†	Cooperation Agreement "AC cabling system for solar micro-inverter" by and among Enphase Energy, Inc., and Phoenix Contact GmbH & Co. KG and Phoenix Contact USA, Inc., dated December 7, 2010.	S-1	333-174925	10.16	6/15/2011	
10.6	Amendment No. 2 to the Cooperation Agreement and Amendment No. 1 by and among Enphase Energy, Inc., Phoenix Contact GmbH & Co. KG and Phoenix Contact USA, Inc., dated September 1, 2016.	10-Q	001-35480	10.3	11/2/2016	
10.7	Flextronics Logistics Services Agreement by and between Enphase Energy, Inc. and Flextronics America, LLC, dated May 1, 2009.	S-1	333-174925	10.17	6/15/2011	
10.8	Amendment #1 to the Flextronics Logistics Services Agreement, by and between Enphase Energy, Inc. and Flextronics America, LLC, dated July 28, 2016.	10-Q	001-35480	10.4	11/2/2016	
10.9	Flextronics Manufacturing Services Agreement by and between Enphase Energy, Inc. and Flextronics Industrial, Ltd., dated March 1, 2009, as amended.	S-1	333-174925	10.18	6/15/2011	
10.10	Master Development and Production Agreement by and between Enphase Energy, Inc. and Fujitsu Microelectronics America, Inc., dated August 19, 2009.	10-Q	001-35480	10.1	5/6/2015	
10.11	License and Technology Transfer Agreement by and between Enphase Energy, Inc. and Ariane Controls, Inc., dated December 21, 2007.	S-1	333-174925	10.20	6/15/2011	
10.12	Software License Agreement by and between PVI Solutions, Inc. (subsequently known as Enphase Energy, Inc.) and DCD, Digital Core Design, dated May 8, 2007, as amended.	S-1	333-174925	10.21	6/15/2011	
10.13+	Non-employee Director Compensation Policy.	10-Q	001-35480	10.28	5/8/2013	
10.14+	Offer Letter by and between Enphase Energy, Inc. and David Ranhoff, dated December 1, 2017.	8-K	001-35480	10.1	12/5/2017	
10.15+	Severance and Change in Control Benefit Plan.	10-Q	001-35480	10.50	5/8/2013	
10.16	Securities Purchase Agreement, by and among Enphase Energy, Inc. and the purchasers identified on Exhibit A thereto, dated January 9, 2017.	8-K	001-35480	10.1	1/10/2017	
10.17+	Offer Letter by and between Enphase Energy, Inc. and Eric Branderiz, dated December 1, 2018.	10-Q	001-35480	10.1	8/6/2018	
10.18	Securities Purchase Agreement, dated August 14, 2018, by and between Enphase Energy, Inc. and the Rodgers Massey Revocable Trust dtd 4/4/11.	8-K	001-35480	10.2	8/17/2018	
10.19	2019 Performance Bonus Program Summary.	8-K	001-35480	10.1	2/6/2019	
10.20	Stockholders Agreement, dated as of August 9, 2018, by and between Enphase Energy, Inc. and SunPower Corporation.	SC 13D	005-86790	SC 13D	8/20/2018	

Exhibit Number	Exhibit Description	Form	Incorporation by Reference			Filed Herewith
			SEC File No.	Exhibit	Filing Date	
10.21†	Master Supply Agreement, dated August 9, 2018, between Enphase Energy, Inc. and SunPower Corporation.	8-K/A	001-35480	99.1	10/23/2018	
10.22†	Amendment No. 1 to Master Supply Agreement, dated December 10, 2018, by and between Enphase Energy, Inc. and SunPower Corporation.	10-K	001-34166	10.74	2/14/2019	
10.23	Bayside Parkway Lease by and between Enphase Energy, Inc. and Dollinger Bayside Associates, dated April 12, 2018.	10-K	001-35480	10.45	3/15/2019	
10.24	Form of Convertible Note Hedge Transaction Confirmation.	8-K	001-35480	10.2	6/5/2019	
10.25	Form of Warrant Confirmation.	8-K	001-35480	10.3	6/5/2019	
10.26+	Offer Letter, dated January 16, 2018, and 2019 Merit Focal Review, dated May 10, 2019, to Jeffery McNeil.	10-Q	001-35480	10.4	7/30/2019	
21.1	List of Subsidiaries of the Registrant					X
23.1	Consent of Deloitte & Touche LLP, Independent Registered Public Accounting Firm					X
24.1	Power of Attorney (incorporated by reference to the signature page of this Annual Report on Form 10-K).					X
31.1	Certification of Chief Executive Officer pursuant to Rule 13a-14(a)/15d-14(a).					X
31.2	Certification of Chief Financial Officer pursuant to Rule 13a-14(a)/15d-14(a).					X
32.1*	Certification of Chief Executive Officer and Chief Financial Officer pursuant to 18 U.S.C. Section 1350 as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.					X
101.INS	XBRL Instance Document.					X
101.SCH	XBRL Taxonomy Extension Schema Document.					X
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document.					X
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document.					X
101.LAB	XBRL Taxonomy Extension Label Linkbase Document.					X
101.PRE	XBRL Taxonomy Extension Presentation Document.					X
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibits 101)					X

\+ Management compensatory plan or arrangement.

† Confidential treatment has been granted for certain portions of this exhibit. Omitted information has been filed separately with the Securities and Exchange Commission.

* The certifications attached as Exhibit 32.1 accompany this quarterly report on Form 10-K pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, and shall not be deemed "filed" by Enphase Energy, Inc. for purposes of Section 18 of the Securities Exchange Act of 1934, as amended.

Item 16. Form 10-K Summary

Not Applicable

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 February 21, 2020.

Enphase Energy, Inc.

By: /s/ BADRINARAYANAN KOTHANDARAMAN
Badrinarayanan Kothandaraman
President and Chief Executive Officer

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Badrinarayanan Kothandaraman and Eric Branderiz, jointly and severally, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to sign any and all amendments to this Annual Report on Form 10-K and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents full power and authority to do and perform each and every act and thing requisite or necessary to be done in and about the premises hereby ratifying and confirming all that said attorneys-in-fact and agents, or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

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 and in the capacities on the dates indicated.

Signature	Title	Date
/s/ BADRINARAYANAN KOTHANDARAMAN Badrinarayanan Kothandaraman	President and Chief Executive Officer (Principal Executive Officer)	February 21, 2020
/s/ ERIC BRANDERIZ Eric Branderiz	Executive Vice President and Chief Financial Officer (Principal Financial Officer)	February 21, 2020
/s/ MANDY YANG Mandy Yang	Vice President, Chief Accounting Officer and Treasurer (Principal Accounting Officer)	February 21, 2020
/s/ STEVEN J. GOMO Steven J. Gomo	Director	February 21, 2020
/s/ BENJAMIN KORTLANG Benjamin Kortlang	Director	February 21, 2020
/s/ RICHARD MORA Richard Mora	Director	February 21, 2020
/s/ THURMAN JOHN RODGERS Thurman John Rodgers	Director	February 21, 2020

Enphase
Your energy.
Your choice.
Always-On.

Enphase Energy, Inc.

Corporate headquarters

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enphase.com
707-774-7000

Investor relations

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707-763-4784 x7354

Transfer agent and registrar

American Stock Transfer & Trust Company, LLC
Operations Center
6201 15th Avenue
Brooklyn, New York 11219
astfinancial.com
800-937-5449

Independent registered public accounting firm

Deloitte & Touche LLP

Stock exchange listing

Enphase Energy, Inc. common stock trades on the NASDAQ Global Market under the symbol ENPH
Financial and investor information is available on the company's investor relations website at investor.enphase.com