Risk Factors Summary

Investing in our securities involves a high degree of risk. The following is a summary of the principal factors that make an investment in our securities speculative or risky, as more fully described below in the section titled "Risk Factors." This summary should be read in conjunction with the "Risk Factors" section and should not be relied upon as an exhaustive summary of the material risks facing our business. In addition to this summary, you should consider the information set forth in the "Risk Factors" section and the other information contained in this annual report before investing in our securities:

Risk Related to our Business, Operations and Our Industry

- Unfavorable macroeconomic and market conditions may adversely affect our industry, business and financial results.
- If demand for solar energy solutions does not grow or grows at a slower rate than we anticipate, our business will suffer.
- The reduction, elimination or expiration of government subsidies and economic incentives for on-grid solar electricity applications could reduce demand for solar photovoltaic ("PV") systems and harm our business.
- We depend on limited-source suppliers for key components and products. If we are unable to source these components and products on a timely basis, we will not be able to deliver our products to our customers.
- Challenges relating to current supply chain constraints, including with respect to semiconductors and integrated circuits, could adversely impact our revenues, gross margins and results of operations.
- The solar industry is highly competitive, and we expect to face increased competition as new and existing competitors introduce products or develop alternative technologies, which could negatively impact our business, financial condition and results of operations.
- Our recent and planned expansion into existing and new markets could subject us to additional business, financial and competitive risks.
- We may fail to capture customers as we design and develop new products, and update existing products.
- We depend upon a small number of outside contract manufacturers, and our business and operations could be disrupted if we encounter problems with these contract manufacturers.
- We rely primarily on distributors, installers and providers of solar financing to assist in selling our products to customers, and the failure of these customers to perform at the expected level, or at all, would have an adverse effect on our business, financial condition and results of our operations.
- The COVID-19 pandemic may continue to, and other actual or threatened epidemics, pandemics, outbreaks, or public health crises may in the future, adversely affect our and our customers' results of operations and financial condition, our supply chain and our business.
- The loss of, or events affecting, one of our major customers could reduce our sales and have an adverse effect on our business, financial condition and results of operations.
- Our energy systems, including our storage solution, integrated ACM Module, IQ8 solar microinverters and Ensemble technology, may not achieve broader market acceptance, which would prevent us from increasing our revenue and market share.
- If our IQ Microinverters or IQ Batteries contain manufacturing defects, or our Ensemble contains software defects, our business and financial results could be harmed.
- 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.
- Any failure by management to properly manage growth could have a material adverse effect on our business, operating results and financial condition.
- Our business has been and could continue to be affected by seasonal trends and construction cycles.

Risk Related to our Intellectual Property and Technology

- We are dependent on information technology systems, infrastructure and data. We could be subject to breaches of our information technology systems caused by system security risks, failure of our data protection, cyber-attacks and erroneous or non-malicious actions or failures to act by our employees or others with authorized access to our networks, which could cause significant reputational, legal and financial damages.
- The software we use in providing system configuration recommendations or potential energy savings estimates to customers relies in part on third-party information that may not be accurate or up-to-date; this may therefore generate inaccurate recommendations or estimates, resulting in a loss of reputation and customer confidence.
- We are subject to stringent privacy laws, information security policies and contractual obligations governing the use, processing and transfer of personal information and 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.
- If we fail to protect, or incur significant costs in enforcing, our intellectual property and other proprietary rights, our business and results of operations could be materially harmed.
- 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.
- 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.

Risk Related to Legal Proceedings and Regulations

- Changes in current laws or regulations or the imposition of new laws or regulations, or new interpretations thereof, in the solar energy sector, by federal or state agencies in the United States or foreign jurisdictions could impair our ability to compete, and could materially harm our business, financial condition and results of operations.
- Changes in the United States trade environment, including the recent imposition of import tariffs, could adversely affect the amount or timing of our revenues, results of operations or cash flows.
- Our significant international operations subject us to additional risks that could adversely affect our business, results of operations and financial condition.
- We could be adversely affected by any violations of the FCPA, the U.K. Bribery Act, and other foreign anti-bribery laws.

Risk Related to our Financial Condition and Liquidity

- Our gross profit may fluctuate over time, which could impair our ability to 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.
- 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.
- 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.
- 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.

Risk Related to our Acquisition Activity

- As part of growing our business, we have made and expect to continue to make acquisitions. If we fail to successfully select, execute or integrate our acquisitions, then our business and operating results could be harmed and our stock price could decline.

Risk Related to our Debt and Equity Securities

- The market price of our common stock may be volatile or may decline regardless of our operating performance.
- Conversion of our Convertible Notes may dilute the ownership interest of existing stockholders or may otherwise depress the price of our common stock, adversely affect our financial condition and operating results.
- The convertible note hedge and warrant transactions and/or their early termination may affect the value of our common stock.
- Our financial results may vary significantly from quarter to quarter due to a number of factors, which may lead to volatility in our stock price.

PART I

Item 1. Business

Our Company

We are a global energy technology company originally founded in March 2006 under the name PVI Solutions, Inc. in the State of Delaware and subsequently changed our name to Enphase Energy, Inc. in July 2007. We deliver smart, easy-to-use solutions that manage solar generation, storage and communication on one platform.

Today, our intelligent microinverters work with virtually every solar panel made, and when paired with our award-winning smart battery technology, results in one of the industry's best-performing clean energy systems. For the first time in the evolution of our centuries-old grid, people can get paid for the clean energy they produce and share with their communities, helping to build a new energy future that harnesses the sun. This clean, free, abundant source of energy can power our lives and ultimately help replace fossil fuels altogether. We have shipped approximately 58 million microinverters, and over 3.0 million Enphase residential and commercial systems have been deployed in more than 145 countries.

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 string inverter system using string modules, whether with or without an optimizer, which only converts the 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® Energy System™ 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 Energy System uses a single technology platform for seamless management of the whole solution, enabling rapid commissioning with the Enphase® Installer App, consumption monitoring with Enphase IQ™ Gateway with IQ™ Combiner+, Enphase® App, a cloud-based energy management platform and our IQ™ Battery. System owners can use the Enphase App 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, that allows cost-effective remote maintenance and ongoing utility compliance.

The solar industry is transitioning from solar only systems to complete energy management solutions, which consist of solar, batteries, load control, electrical vehicle ("EV") charging, compatibility with third-party generators, and grid services. This transition has contributed to the rising global interest in the full electrification of homes and businesses through renewable sources of energy.

Our Strategy

Our objective is to build best-in-class home energy systems and deliver them to homeowners through our installer and distribution partners, enabled by a comprehensive digital platform. Key elements of our strategy include:

- *Best-in-class customer experience.* Our value proposition is to deliver products that are productive, reliable, smart, simple and safe, with superior customer service, to enable homeowners' storage and energy independence. 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 homeowners. We are convinced that continued reinforcement of customer experience improvements by providing 24x7 support can be a competitive advantage for us.
- *Grow market share worldwide.* We intend to capitalize on our market leadership in the microinverter category and our momentum with installers and homeowners to expand our market share position in our core markets. In addition, we intend to further increase our market share in the Europe, Asia Pacific and Latin America regions. Further, we intend to expand into new markets, including emerging markets, with new and existing products and local go-to-market capabilities.
- *Expand our product offerings.* We distinguish ourselves from other inverter companies with our systems-based and high technology approach, as we continue to invest in research and development to develop all components of our home energy management systems 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 home 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 and alternating current ("AC") output power in order to pair with higher rated direct current ("DC") modules while reducing costs per watt.
- *Increase storage energy density and reduce installation time and cost per kWh*. Our engineering team is focused on increasing the energy density of our battery capacity, quality and reducing installation time and cost per kWh to make solar-plus-storage resilient, sustainable and affordable for the masses.
- *Focus on the homeowner and installer partners.* We are focused on making it easier for installers and customers to do business and generating revenue through digitalization of the business-to-business and business-to-customer process of the installer and customer journey. Our key focus is to expand our digital presence through enhancing our array of tools on our digital platform to keep us continually connected with our installers and homeowners, as well as increasing the use of the online store significantly.

Our Products

The Enphase Energy System, powered by IQ® Microinverters, IQ Batteries and other products and services, is an integrated solar, storage and energy management offering that enables self-consumption and delivers our core value proposition of yielding more energy, simplifying design and installation and improving system uptime and reliability.

IQ Microinverters. The Enphase IQ7™ microinverter and Enphase IQ7+™ microinverter, part of our seventh-generation IQ product family, support high-powered 60-cell and 72-cell solar modules and integrate with AC modules. Our IQ7X™ microinverter addresses 96-cell PV modules up to 400W DC and, with its 97.5% California Energy Commission efficiency rating, is ideal for integration into high power modules. 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.

During 2020, we started shipping our IQ7A™ microinverter for high-power monofacial and bifacial solar modules to customers in Australia and Europe. IQ7A microinverters, which we began shipping to customers in North America in November 2019, support up to 450W high-power modules, targeting high-power residential and

commercial applications. Our customers will be able to pair the IQ7A microinverter with monofacial or bifacial solar modules, up to 450W DC, from solar module manufacturers who are expected to introduce high-power variants of their products in the next three years.

We began shipping our Enphase Energy System with IQ8™ microinverters in the fourth quarter of 2021 to customers in North America, and in the fourth quarter of 2022 to customers in France and the Netherlands. Our investment in custom application specific integrated circuit chips has resulted in a software-defined microinverter smart enough to form a microgrid. Many homeowners often assume that their solar systems will function if the sun is shining, even during a power outage. This has unfortunately not been true until the introduction of IQ8, which allows homeowners to realize the true promise of solar, to make and use their own power. IQ8 solar microinverters can provide Sunlight Backup™ during an outage, even without a battery.

In the second quarter of 2022, the Enphase IQ8 microinverter-based system was the first in the world to be certified by UL, a global safety science leader, to UL 1741, 3rd edition including the Supplement SB. This certification meets the new North American safety and grid interconnection standards for connecting solar inverters, energy storage systems and distributed energy resources to the grid in compliance with IEEE 1547-2018 and IEEE 1547-1 2020.

AC Module (“ACM”) products are integrated systems that allow installers to be more competitive through improved logistics, reduced installation times, faster inspection and training. We continue to make steady progress with our ACM partners, including SunPower Corporation and Maxeon Solar Technologies, Ltd.

IQ Batteries. Our Enphase IQ Battery storage systems, with usable and scalable capacity of 10.1 kWh and 3.4 kWh, are based on our Ensemble OS™ energy system, which powers the world’s first grid-independent microinverter-based storage system to customers in North America and has been shipping since the second quarter of 2020. The Enphase IQ Battery storage systems feature our embedded grid-forming microinverters that enable the Always-On capability that keeps homes powered when the grid goes down and the ability to save money when the grid is up. These systems are now compatible with both new and existing Enphase IQ solar systems with M-series™, IQ6™ and IQ7 microinverters. In January 2021, we announced expanded compatibility of the Enphase Energy System with our M-series microinverters and string inverters. The expanded compatibility provides approximately 300,000 additional Enphase system owners with the possibility of achieving grid-agnostic energy resilience through the Enphase Upgrade Program. The program provides solar installers the opportunity to renew engagements with the installed base of Enphase system owners through microinverter, solar and energy storage upgrades and reflects our continued commitment to reliability, service and long-term customer relationships. We currently ship our Enphase IQ Battery storage systems to customers in North America, Belgium and German. Enphase IQ Batteries in Belgium and Germany can be installed with both single-phase and three-phase third-party solar energy inverters, enabling homeowners to upgrade their existing home solar systems with a residential battery storage solution that reduces costs while providing increased self-reliance.

During the second quarter of 2021, we introduced our IQ™ Load Controller for our Enphase IQ Battery storage systems. Load control allows homeowners to decide what gets power in their home in the event of a grid outage, with the ability to choose up to four loads. These loads will be on when the grid is present and shed automatically in the event of a grid failure. This product makes installation simpler and saves time for installers.

Our Enphase Energy System integrates with most leading models of home standby AC generators, providing enhanced performance and a glitch-free transition for homeowners during power outages. Homeowners can also monitor real-time power flow, start and stop their generator remotely, set quiet hours to prevent their generator from operating until their batteries fall below a designated threshold, and control it all with the Enphase App. The new feature functions without a generator automatic transfer switch and is designed to eliminate the power glitches that reset home electronic appliances when switching to generator power.

Our home energy systems are architected to efficiently manage generation, storage and consumption resources in the home to ensure the best customer experience. During 2022, we announced that Enphase IQ Batteries officially support the most common third-party solar energy string inverters in Belgium and Germany, helping meet the increasing demand for energy independence in the region.

In October 2022, we acquired GreenCom Networks AG (“GreenCom”), which allows us to provide Internet of Things software (IoT) solutions for customers to connect and manage a wide range of distributed energy devices within the home. This acquisition allows us to add a local engineering team in France and Germany to service the accelerating clean energy transition in Europe, provide installers with a complete home energy management system

integrating Enphase microinverters and batteries with third-party EV chargers and heat pumps, and enable homeowners to monitor and control their devices from the Enphase App.

Electric Vehicle Chargers. In December 2021, we acquired ClipperCreek, Inc. ("ClipperCreek"), which allows us to offer EV charging solutions for residential and commercial customers in the United States. The increasing penetration of EVs has implications for home energy management, as households not only consume significantly more power with an EV, but also have a large battery that can be used for both backup and grid service. Our EV chargers are compatible with most EVs sold in North America.

Grid Services. We participate in the ConnectedSolutions program, which is an incentive program implemented by two utilities in the Northeast region of the United States to reduce electrical demand during high-use periods. Enphase storage customers in Connecticut, Massachusetts, and Rhode Island can sign-up, monitor, track money earned and control participation in the program using the Enphase App. We announced during the third quarter of 2021 our participation in Hawaiian Electric's Battery Bonus grid services program. This program offers a new incentive for homeowners on the island of Oahu to install a new home battery. During the fourth quarter of 2021, we announced our participation in the Arizona Public Service ("APS") residential battery services program. The APS program offers homeowners who install Enphase IQ Batteries in its service territory the chance to participate and earn money through one-time, upfront incentives. In addition, we announced during the first quarter of 2022 that the Vermont-based utility Green Mountain Power ("GMP") will offer Enphase Energy Systems to its customers in a cutting-edge battery lease grid services pilot program. Homeowners can also enroll in GMP's "Bring Your Own Device" grid services program, which allows customers with their own Enphase Energy Systems to participate and earn an up-front incentive. These grid services programs enable utilities to leverage the IQ Battery instead of turning on polluting peaker plants, while generating an income stream for the IQ Battery owner. Although these programs do not currently drive material revenues, we believe that facilitating grid services participation for our customers can reduce the lifetime cost of IQ Batteries and help drive increased demand for our Enphase Energy Systems.

In December 2022, Pacific Gas & Electric Company ("PG&E") and Enphase announced the launch of a fixed power solutions pilot program, Residential Storage Initiative, in which PG&E is providing free Enphase IQ Battery storage systems to approximately 100 low-income residential customers that have been the most frequently impacted by outages as a result of PG&E's Enhanced Powerline Safety Settings. Customers participating in the pilot will be auto enrolled in the PG&E Power Saver Rewards program, where they can earn money and help California avoid power interruptions by reducing consumption and utilizing energy stored in their battery systems during times of high demand.

Enphase Installer Platform. In January 2021, we acquired Sofdesk Inc. ("Sofdesk"), which allows us to provide design and proposal software. In March 2021, we acquired the solar design services business of DIN Engineering Services LLP ("DIN"), which allows us to provide proposal and permitting services, and which focuses on automating the creation of permit plan sets to further expand the installer base.

In December 2021, we acquired 365 Pronto, Inc ("365 Pronto"), which allows us to offer a predictive software platform dedicated to simplifying the cleantech service landscape by matching cleantech asset owners to a local and on-demand workforce of service providers. In March 2022, we acquired SolarLeadFactory, LLC ("SolarLeadFactory"), which allows us to provide high quality leads to solar installers, with the objective of increasing lead volumes and conversion rates to help drive down the customer acquisition costs for installers.

Customers and Sales

We currently offer solutions targeting the residential and commercial markets in the United States, Canada, Mexico, Europe, Australia, New Zealand, India, Brazil, the Philippines, Thailand, South Africa and certain other Central American and Asian markets. We sell primarily to solar distributors who combine our products with others, including solar modules products and racking systems, and resell to installers in each target region. In addition to our solar distributors, we sell directly to select large installers, original equipment manufacturers ("OEM") and strategic partners. Our OEM customers include solar module manufacturers who integrate our microinverters with their solar module products and resell to both distributors and installers. Strategic collaborators include a variety of companies, including industrial equipment suppliers and providers of solar financing solutions. We also sell certain products and services to homeowners, primarily in support of our warranty services and legacy product upgrade programs, via our online store. In the year ended December 31, 2022, 2021 and 2020, one customer accounted for approximately 37%, 34% and 29%, respectively, of total net revenues. The revenues generated from the United States market have represented 76%, 80% and 82% of our total revenue for the annual period ending on December 31, 2022, 2021 and 2020, respectively.

Competition

The markets for our products are highly competitive and we compete with central and string inverter manufacturers, storage system manufacturers, and new technologies that compete with our business. 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.

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 string 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 string inverter approach.
- *Reliability issues*. Traditional string 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, string inverters typically carry warranties of only 5 to 10 years.
- *Complex design and installation requirements*. The string inverter-based solar PV installation requires greater effort on the part of the installer, both in terms of design and on-site labor. String inverter installations require string design and calculations for safe and reliable operation, as well as specialized equipment such as direct current ("DC") combiners, conduits and disconnects. In addition, the use of high-voltage DC requires specialized knowledge and training and safety precautions to install string inverter technology.
- *Safety issues*. String 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 string 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 string 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 string 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, string inverter installations operate at high-voltage DC, which bears significant fire risks. Further, due to their large size, string inverter installations can affect architectural aesthetics of the house or commercial building.

Several of our existing and potential competitors are significantly larger than us 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 in creating market awareness for these offerings.

Competitors in the inverter market include, among others, SolarEdge Technologies, Inc., Fronius International GmbH, SMA Solar Technology AG, AP Systems, Generac Holdings Inc., Tesla, Inc., Huawei Technologies Co. Ltd., Delta, Ginglong, Sungrow, Solax, Hoymiles and other companies offering microinverters and string inverters with and without solar optimizers. We believe 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 on the roof.

Competitors in the storage market include Tesla, SolarEdge, LG Chem, Sonnen, Generac, Panasonic, BYD, E3/DC, Senec, Schneider, Briggs & Stratton and other producers of battery cells and integrated storage systems market. Competitors in the EV charger market include Wallbox, ChargePoint, Tesla, JuiceBox and EVBox, among others.

Manufacturing, Quality Control and Supply Chain Management

We utilize a sourcing strategy that emphasizes global procurement of materials and product manufacturing in lower cost regions. We outsource the manufacturing of our products to third-party contract manufacturers. Flex Ltd. and affiliates (“Flex”), Salcomp Manufacturing India Pvt. Ltd. (“Salcomp”) and Sunwoda Electric Co. Ltd. (“Sunwoda”) assemble and test our microinverters, IQ Battery storage systems and IQ Gateway 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 corresponding 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. During the fourth quarter of 2020, we qualified Amperex Technology Limited in addition to A123 Systems LLC as our lithium-ion battery suppliers to help increase our available capacity. In addition, we rely on several unaffiliated companies to supply certain components used in the fabrication of our products.

Our relationships with Flex, Salcomp and Sunwoda provide us with strategic manufacturing capabilities and flexibility. Eighth-generation Enphase IQ Microinverters are produced by Flex in Mexico and Salcomp in India. In addition, we expect to begin microinverter production by Flex in Romania in the first quarter of 2023 to ship directly to customers in Europe, thereby shortening delivery times. We also plan to begin microinverter production with new contract manufacturing partners in the United States in 2023. We anticipate that this additional manufacturing capacity in Romania and United States could help us better serve our customers by cutting down delivery times and diversifying our supply chain, as well as mitigate tariffs that apply from products sourced from countries such as China.

In the first quarter of 2023, we will begin production shipments of Enphase branded EV chargers at our existing contract manufacturing facility in Mexico. We expect this move could help to meet the rapidly growing demand for reliable and affordable EV charging solutions by providing a greater supply of product and more predictable lead times.

For a further discussion of actions taken to manage through the ongoing global supply chain constraints, see Part II, Item 7, Management’s Discussion and Analysis of Financial Condition and Results of Operations—Global Events Affecting our Business and Operations of this Annual Report on Form 10-K.

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 Enphase App. We have introduced the Enphase Community, a place for homeowners and installers to ask questions or provide feedback about our products and services, discuss products and services with other Enphase users and enthusiasts, provide tips for using our products and services to the community, and get help from homeowners and installers to solve their problems quickly. We significantly improved features in Service-on-the-Go™, which installers can use from their mobile devices to get service instantly. We continue to provide 24/7 support for installers and Enphase system owners globally across its phone, online chat and email communications channel. We continue to hire and train our customer service agents with a goal of reducing average customer wait times to under one minute, and we continue to expand our field service technicians hiring in United States, Europe and Australia to provide direct homeowner assistance. The emphasis on superior customer experience has further increased due to severe weather events. Our Net Promoter Score (commonly referred to as "NPS") improved to 69% in 2022 from 67% in 2021 through multiple customer service initiatives.

Research and Development

We plan to continue to devote substantial resources to research and development with the objective of developing new products and systems and increasing the value or reducing the cost of existing products and systems. Our research and development roadmap identifies new product features and defines improvement targets for existing products that enhance the benefit of our energy management solutions to our customers and support our growth plans. We measure the effectiveness of our research and development using metrics that include product cost, performance and reliability, homeowner and installer experience, as well as timeliness of the new developments.

Intellectual Property

We operate in an industry in which innovation, investment in new ideas and protection of our intellectual property 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, 2022, we had approximately 268 issued U.S. patents, 101 issued foreign patents, 69 pending U.S. patent applications and 118 pending foreign counterpart patent applications. Our issued patents are scheduled to expire between years 2023 and 2046.

We have licensed certain technologies for application in hardware and software in our products. Such licenses are generally fully-paid, royalty-free licenses. Given the volume and pace of new patents worldwide, it may become necessary in the future to license intellectual property on terms that are yet unknown to us, and that may be less favorable than licenses in the past. In addition, we license open source software from various third parties for use in hardware and software. Such open source software is licensed under open source licenses, and we take efforts to maintain compliance with such licenses.

We continually assess the need for patent protection for those aspects of our technology that we believe provide significant competitive advantages. A majority of our patents relate to DC to AC power conversion, energy storage devices and related energy environments.

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 and storage manufacturing processes 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 trademarks and service marks in the United States and in other countries, including Enphase, the Enphase "e", IQ, Ensemble OS, Encharge, IQ Gateway, Enpower and Enlighten. We 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 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 or misappropriating our intellectual property or from otherwise gaining access to our technology.

Government Regulations

Our business activities are subject to a changing patchwork of laws and regulations that prevail at the federal, state, regional and local level as well as in those foreign jurisdictions. For example, substantially all of our import operations are subject to complex trade and customs laws, regulations and tax requirements such as sanctions orders or tariffs set by governments through mutual agreements or unilateral actions. In addition, the countries in which our products are manufactured or imported may from time to time impose additional duties, tariffs or other restrictions on our imports or adversely modify existing restrictions. Changes in tax policy or trade regulations, the disallowance of tax deductions on imported merchandise, or the imposition of new tariffs on imported products, could have an adverse effect on our business and results of operations. Compliance with these laws, rules and regulations has not had, and is not expected to have, a material effect on our capital expenditures and results of operations.

We are also subject to other complex foreign and U.S. laws and regulations related to anti-bribery and corruption laws, antitrust or competition laws and data privacy laws, such as the EU General Data Protection Regulation, among others. We have policies and procedures in place to promote compliance with these laws and regulations. To date, our compliance actions and costs relating to these laws, rules and regulations have not resulted in a material cost or effect on our capital expenditures, earnings or competitive position. Government regulations are subject to change, and accordingly we are unable to assess the possible effect of compliance with future requirements or whether our compliance with such regulations will materially impact our business in the future.

In February 2022, armed conflict escalated between Russia and Ukraine. The United States and certain other countries have imposed sanctions on Russia and could impose further sanctions, which could further damage or disrupt international commerce and the global economy. While we do not have sales or operations in Russia or Ukraine, it is possible that the conflict or actions taken in response, could adversely affect some of our markets and suppliers, the broader economic and financial markets, or costs and availability of components and materials, or cause further supply chain disruptions.

Government Incentives

U.S. federal, state and local government bodies, as well as non-U.S. government bodies provide incentives to owners, distributors, system integrators and manufacturers of solar energy systems to promote solar energy in the form of rebates, tax credits, lower VAT rate and other financial incentives, such as system performance payments, payments for renewable energy credits associated with renewable energy generation and exclusion of solar energy systems from property tax assessments. 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, often depends in large part on the availability and size of these government subsidies and economic incentives, which vary by geographic market and from time to time, thus helping to catalyze customer acceptance of solar energy as an alternative to utility-provided power. The disallowance or changes in government subsidies or economic incentives could have an adverse effect on our business and results of operations. Among other government-established incentives, net metering and related policies have supported the growth of on-grid solar products, and changes to such policies may significantly reduce demand for electricity from our solar service offerings. Net metering provides for the compensation of a customer's excess solar generation to the electrical grid.

In August 2022, the IRA was enacted, which includes extension of the investment tax credit ("ITC") as well as a new advanced manufacturing production tax credit ("AMPTC"), to incentivize clean energy component sourcing and production, including for the production of solar related components, battery cells and battery packs. The IRA provides for an AMPTC on microinverters of 11 cents per alternating current watt basis. The AMPTC for each component including on microinverters decreases by 25% each year beginning in 2030 and ending after 2032. Under the IRA, the ITC was extended until 2032 to allow a qualifying homeowner to deduct 30% of the cost of installing residential solar systems from their U.S. federal income taxes, thereby returning a material portion of the purchase price of the residential solar system to homeowners. Under the terms of the current extension, the ITC will remain at 30% through the end of 2032, reduce to 26% for 2033, reduce to 22% for 2034 and further reduce to 0.0% after the end of 2034 for residential solar systems, unless it is extended before that time. We believe the enactment of the IRA is favorable to our overall business worldwide; however, we are continuing to evaluate the

overall impact and applicability of the IRA to our results of operations going forward, including the revisions to the U.S. Internal Revenue Code, which includes a 15% corporate minimum income tax and a 1% excise tax on corporate stock repurchases in tax years beginning after December 31, 2022.

In December 2022, the California's Public Utilities Commission ("CPUC") approved and voted for a new net metering policy, called Net Energy Metering 3.0 ("NEM 3.0"), which will be in effect starting April 15, 2023. The new policy reduces the compensation earned by solar customers selling extra energy to the grid by a substantial amount. The average export rate in California is expected to be approximately $0.05/kWh to $0.08/kWh when effected compared to current average of $0.25/kWh to $0.35/kWh. NEM 3.0 in California may reduce demand for solar PV systems, including our future inverter sales.

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.

Environment and Climate Change

We have understood the climate change threat from the beginning and have been creating clean energy technologies needed to directly combat it, protect our environment and enable sustainable development. We recognize our ability to do so rests on our capacity to understand, anticipate and successfully navigate various types of climate risk. Our strategy is advancing solutions to meet any number of climate risk mitigation opportunities – solar energy equipment, battery storage, EV charging, smart load management and integration with grid modernization efforts.

We align our risk assessment and climate strategy with the recommendations of the Taskforce for Climate-Related Financial Disclosures ("TCFD") and emerging climate-risk disclosure recommendations from the International Financial Reporting Standards foundation. We issued our second TCFD aligned Environmental, Social and Governance Report in 2022 and plan to follow up with another aligned report in 2023.

We believe that sound corporate governance is critical to helping us achieve our goals, including with respect to designing products that address both energy generation and consumption. We continue to evolve a governance framework that exercises appropriate oversight of responsibilities at all levels throughout the company and manages its affairs consistent with high principles of business ethics and advancing a sustainable future for all.

Human Capital Resources

As of December 31, 2022, we had 2,821 full-time employees. Of the full-time employees, 952 were engaged in research and development, 1,169 in sales and marketing, 239 in general and administration, 316 in design permitting services and 145 in manufacturing and operations. Of these employees, 1,002 were in the United States, 1,424 in India, 107 in New Zealand, 161 in Europe, 43 in Canada, 26 in Australia, 25 in China, 23 in Mexico and 10 in Brazil.

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.

Culture

Supporting our purpose of "Advancing a sustainable future for all," all employees are expected to uphold the following core values that drive our culture:

- Customer First
- Integrity
- Innovation
- Teamwork

- Quality

These core values are represented by how we work together, how we perform and how we all get rewarded. Values are reinforced in new hire training, culture workshops and everyday interactions.

Talent

Our talent and culture are critical to our success. Our human capital management philosophy and objectives focus on creating a high-performance culture in which our employees deliver, succeed and lead. We achieve our objectives through various employee engagement and talent development efforts. Our employee engagement efforts include our quarterly all-employee town hall meetings, through which we aim to keep our employees well-informed and to increase transparency, and employee engagement surveys, through which we incorporate critical employee feedback into our culture, operations and strategic plans. We have established relationships with top universities worldwide, professional associations and industry groups to build a talent pipeline and established the Enphase Learning Academy to provide employees with on demand relevant technical and professional programs.

We are committed to promoting and cultivating an inclusive and diverse culture that welcomes and celebrates everyone without bias. In addition, we look to actively engage within our communities to foster and attain social equity. We became a corporate sponsor of the non-profit Women in Cleantech and Sustainability and our Chief Executive Officer signed the CEO Action for Diversity & Inclusion pledge. This shows our commitment to advancing diversity and inclusion in the workplace.

Compensation Philosophy

Our compensation philosophy creates the framework for our rewards strategy. We have a pay-for-performance culture that ties compensation to the performance of the individual and our company. We provide competitive compensation programs that focus on the following five key elements:

- Pay-for-performance: Reward and recognize leading contributors and high potential employees by paying market competitive total direct compensation, which includes base salary, quarterly bonus or commission, and stock-based compensation;
- External market-based research: Pay levels that are competitive with respect to the labor markets and industries in which we compete for talent;
- Internal equity: Maintaining internally consistent and non-discriminatory pay and pay practices;
- Fiscal responsibility: Providing programs in line with economic conditions and our company's financial health; and
- Legal compliance: Ensure the organization is legally compliant with employee compensation laws in all states and countries in which we operate.

Health and Wellness

We invest in our employees through high-quality benefits and various health and wellness initiatives. Our benefits packages provide a balance of protection along with the flexibility to meet the individual needs of our employees. Our global work-from-home policy introduced in response to COVID-19 pandemic is still in effect, but modified to allow employees in certain countries and locations to work in a hybrid mode as business necessitate. We are conducting business as usual with no major restrictions to employee travel unless mandated by laws in different countries. We expect these business operating conditions will substantially remain in effect throughout 2023. We will continue to actively monitor the situation and we will make further changes to our business operations as may be permitted by federal, state, or local authorities and that we determine are in the best interests of our employees, end-customers, partners, suppliers and stockholders. Our focus remains on the safety of our employees and business partners, and we strive to protect the health and well-being of the communities in which we operate, in part, by providing technology to our employees, end-customers and business partners to help them do their best work while remote.

Available Information

We file electronically with the U.S. Securities and Exchange Commission ("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 Exchange Act can be accessed on our Investor Relations website at www.investor.enphase.com. Alternatively, you may access these reports at the SEC's website at www.sec.gov. 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. See also "Forward-Looking Statements" in the forepart of this Annual Report on Form 10-K.

Risks Related to our Business, Operations and Our Industry

Unfavorable macroeconomic and market conditions may adversely affect our industry, business and financial results.

Our business depends on the overall demand for our solar energy products and on the economic health and willingness of our customers and potential customers to make capital commitments to purchase our products and services. As a result of macroeconomic or market uncertainty, including increased interest rates and higher inflation, customers may decide to delay purchasing our products and services or not purchase at all. In addition, a number of the risks associated with our business, which are disclosed in these risk factors, may increase in likelihood, magnitude or duration, and we may face new risks that we have not yet identified.

In the past, unfavorable macroeconomic and market conditions have resulted in sustained periods of decreased demand. Macroeconomic and market conditions could be adversely affected by a variety of political, economic or other factors in the United States and international markets, which could, in turn, adversely affect spending levels of installers and end users and could create volatility or deteriorating conditions in the markets in which we operate. Macroeconomic uncertainty or weakness could result in:

- reduced demand for our products as a result of constraints on capital spending for residential solar energy systems by our customers;
- increased price competition for our products that may adversely affect revenue, gross margin and profitability;
- decreased ability to forecast operating results and make decisions about budgeting, planning and future investments;
- business and financial difficulties faced by our suppliers or other partners, including impacts to material costs, sales, liquidity levels, ability to continue investing in their businesses, ability to import or export goods, ability to meet development commitments and manufacturing capability; and
- increased overhead and production costs as a percentage of revenue.

Reductions in customer spending in response to unfavorable or uncertain macroeconomic and market conditions, globally or in a particular region where we operate, would adversely affect our business, results of operations and financial condition.

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

Our IQ Microinverters, ACM products and IQ 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.

Further, our success depends on continued demand for solar energy solutions and the ability of solar equipment vendors to meet this demand. Supply chain disruptions, increased interest rates and higher inflation, have caused and may continue to cause various negative effects, including an inability to meet the needs of our existing or potential end customers. If demand for solar energy solutions decreases or 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.

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 United States, have provided incentives in the form of feed-in tariffs ("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.

Among other government-established incentives, net metering and related policies have supported the growth of on-grid solar products, and changes to such policies may reduce demand for electricity from our solar service offerings. Net metering is a utility rate program that requires a consumer's electric company to purchase the excess solar energy that the consumer's solar panels produce and pay the retail rate for electricity exported to the grid, less certain non-bypassable fees to the consumer. For example, in 2016, the CPUC issued an order retaining retail-based net metering credits for residential customers of California's major utilities net meterings as part of Net Energy Metering 2.0 ("NEM 2.0"). Customers under NEM 2.0 are subject to interconnection charges and time-of-use rates with different electricity prices during peak and off-peak hours. Existing customers who receive service under the prior net metering program, as well as new customers under the NEM 2.0 program, remain eligible for the NEM 2.0 program for a period of 20 years. On September 3, 2020, the CPUC opened a new proceeding to review its current net metering policies and to develop NEM 3.0, also referred to by the CPUC as the NEM 2.0 tariff and issued its final decision on December 15, 2022. NEM 3.0 fundamentally changes NEM 2.0 by basing export compensation not on retail rates, but on a tool called the Avoided Cost Calculator ("ACC") designed to measure utility distribution costs avoided by installing distributed generation, and which provides values that vary by hour, month and service territory. The CPUC is also imposing "adders" to these hourly ACC values for the first several years of the tariff to ease the transition for the solar market. On average, these ACC values are significantly lower than retail rates and may therefore increase payback periods, and thereby reduce demand, for solar-only systems. While the final NEM 3.0 decision was a significant improvement over CPUC's previously issued proposed decision, it could still reduce export compensation and demand for solar-only systems and harm our business.

We depend on limited-source suppliers for key components and products. If we are unable to source these components and products 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, such as our ASICs and lithium-ion batteries. 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.

Challenges relating to current supply chain constraints, including with respect to semiconductors and integrated circuits, could adversely impact our revenues, gross margins and results of operations.

Due to increased demand across a range of industries, the global supply market for certain raw materials and components, including, in particular, semiconductors, integrated circuits and other electronic components used in some of our products, has experienced significant constraint and disruption in recent periods. This constrained supply environment has adversely affected, and could further affect, component availability, lead times and cost and could increase the likelihood of unexpected cancellations or delays of previously committed supply of key components. In an effort to mitigate these risks, we have incurred higher costs to secure available inventory, have extended our purchase commitments and placed non-cancellable, advanced orders with or through suppliers, particularly for long lead time components. Our efforts to expand our manufacturing capacity and multi-source and pre-order components may fail to reduce the impact of these adverse supply chain conditions on our business.

Despite our mitigation efforts, these constrained supply conditions may adversely impact our revenues and results of operations. At the same time, increased costs associated with supply premiums, labor, expediting fees and freight and logistics may adversely impact our gross margin, profitability and ability to reduce the cost to manufacture our products in a manner consistent with prior periods. The COVID-19 pandemic and conflict in Ukraine has also contributed to and exacerbated this strain, and there can be no assurance that the impacts of the pandemic and conflict in Ukraine on our supply chain will not continue, or worsen, in the future. The current supply

chain challenges could also result in increased use of cash, engineering design changes and delays in new product introductions, each of which could adversely impact our business and financial results. In the event these supply chain challenges persist for the foreseeable future, these conditions could adversely impact our results of operations.

The solar industry is highly competitive, and we expect to face increased competition as new and existing competitors introduce products or develop alternative technologies, which could negatively impact our business, financial condition and results of operations.

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. We also compete against manufacturers of energy storage systems and EV chargers for our solutions in these markets.

Competitors in the inverter market include, among others, SolarEdge Technologies, Inc., Fronius International GmbH, SMA Solar Technology AG, AP Systems, Generac Holdings Inc., Tesla, Inc., Huawei Technologies Co. Ltd., Delta, Ginglong, Sungrow, Solax, Hoymiles and other companies offering string inverters with and without solar optimizers. Other existing or emerging companies may also begin offering alternative microinverter solutions. Competitors in the storage market include Tesla, SolarEdge, LG Chem, Sonnen, Generac, Panasonic, BYD, E3/DC, Senec, Schneider, Briggs & Stratton and other producers of battery cells and integrated storage systems market. Competitors in the EV charger market include Wallbox, ChargePoint, Tesla, JuiceBox and EVBox, among others.

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.

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.

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.

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

We currently offer solar energy 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 skilled employees and the efficient execution of our project plan.

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 as we design and develop new products and update existing products.

We are pursuing opportunities in energy management and energy storage that 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, or fail to adequately update our legacy products, we may fail to generate revenue in the quantities or timeline projected, thus, having a materially adverse impact on our operating results and financial stability.

We started production shipments of IQ8 microinverters and our most recent generation of IQ Batteries to customers in North America during the fourth quarter of 2021, and we continue to develop our EV charging products. Our new products are complex and require 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 installers 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 depend upon a small number of outside contract manufacturers, and our business and 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. In particular, we outsource the manufacturing of our products to third-party contract manufacturers. Flex, Salcomp and Sunwoda assemble and test our IQ Microinverter, ACM products, IQ Battery storage systems and IQ Gateway 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 related agreement. As of December 31, 2022, our related purchase obligations (including amounts related to component inventory procured by our primary contract manufacturers on our behalf) were approximately $589.3 million. The timing of purchases in future periods could differ materially from our estimates due to fluctuations in demand requirements related to varying sales levels as well as changes in economic conditions.

Flex also provides receiving, kitting, storage, transportation, inventory visibility and other value-added logistics services at locations managed by Flex. In addition, we rely on several unaffiliated companies to supply certain components used in the fabrication of 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. If any of these suppliers reduce or eliminate the supply of the components to us in the future, our revenues, business, financial condition and results of operations would be adversely impacted.

Further, 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 United States. We believe that the location of these facilities outside of the United States increases our 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, which may not be available to us on favorable terms, if at all. 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.

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 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 product warranty claims that may adversely affect our business and results of operations.

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

We have in the past and may in the future 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, the effects of climate change and related extreme weather events, COVID-19 pandemic impacts 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. Furthermore, counterfeit parts in our supply chain have been and continue to be a concern, since any counterfeit part can be a lower quality product, which may affect our system reliability.

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 of an individual product line could result in a material adverse effect on our revenue, gross profit, competitive position and distributor and customer relationships.

We rely primarily on distributors, installers and providers of solar financing to assist in selling our products to customers, and the failure of these customers to perform at the expected level, or at all, would have an adverse effect on our business, financial condition and results of our operations.

We sell our solutions primarily through distributors, as well as through direct sales to solar equipment installers and developers of third-party solar finance offerings. We do not have exclusive arrangements with these third parties. As a result, many of these third parties, or customers, also use or market and sell products from our competitors, which may reduce our sales. These customers may generally terminate their relationships with us at any time, or with short notice, and further may fail to devote the 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.

We typically provide our distributors and installers with training and other programs, including accreditations and certifications; however, these programs may not be effective or utilized consistently. Further, newer distributors and installers may require extensive training and may take significant time and resources to achieve productivity. Our distributors and installers may subject us to lawsuits, potential liability and reputational harm if, for example, any were to misrepresent the functionality of our platform or products to customers, fail to perform services to our customers' expectations, or violate laws or our policies. In addition, our distributors and installers 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 the growth and development of these relationships or result in the termination of one or more relationships. If we fail to effectively manage and grow our network of distributors and installers, 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.

The COVID-19 pandemic may continue to, and other actual or threatened epidemics, pandemics, outbreaks, or public health crises may in the future, adversely affect our and our customers' results of operations and financial condition, our supply chain and our business.

The global spread of COVID-19 and other actual or threatened epidemics, pandemics, outbreaks, or public health crises may adversely affect our results of operations and disrupt global supply chains. Any disruptions to our suppliers and manufacturers by, for example, worker absenteeism, quarantines, office and factory closures, disruptions to ports and other shipping infrastructure, or other travel or health-related restrictions have adversely

affected and could continue to have an adverse impact on our business and operations. As a result of these supply chain constraints and possible disruptions, we have worked with our suppliers to improve our supply chain in the event of future shutdowns, but there can be no assurance that supply chain constraints and disruptions will not adversely impact our business. In addition, potential disruptions have and could in the future put limits on our manufacturing availability or capacity, or cause delays in production or delivery of components, and our ability to produce finished products, all of which could adversely affect our business, operations and customer relationships.

Our liquidity also may be negatively impacted if sales decline significantly for an extended period due to the impact of COVID-19 or other epidemics. Further, the extent to which the COVID-19 pandemic and our precautionary measures in response thereto impact our business and liquidity will depend on future developments, which are uncertain and cannot be precisely predicted at this time.

Moreover, the long-term effects of the COVID-19 pandemic remain unknown, and it is possible that following the pandemic in-person interactions will remain limited, which would negatively impact our sales team and our future revenues. These and other potential impacts of the COVID-19 pandemic discussed elsewhere in this “Risk Factors” section, as well as any future and unforeseen risks related to the pandemic not yet contemplated, could materially and adversely affect our business, financial condition and results of operations. To the extent the evolving effects of the COVID-19 pandemic adversely affect our business, financial condition and results of operations, they may also have the effect of heightening many of the other risks and uncertainties described elsewhere in this “Risk Factors” section.

It is also possible that future global pandemics could also occur and also materially and adversely affect our business, financial condition and results of operations.

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

For the fiscal year ended December 31, 2022, one customer accounted for approximately 37% of total net revenues. Further, as of December 31, 2022, amounts due from one customer represented approximately 24% of the total accounts receivable balance. 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 has had from time to time, and could in the future have a material adverse effect on our business, financial condition and results of operations.

Our energy systems, including our storage solution, integrated ACM Module, IQ8 solar 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 Enphase Energy System, including international acceptance of our IQ8 microinverters, ACM products and Ensemble technology, 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 and services 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, systems and services 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.

Our success in marketing and selling ACM products depends 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 ACM products 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 and can be attached directly 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 relationships 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 United States.

If our IQ Microinverters or IQ Batteries contain manufacturing defects, or our Ensemble contains software defects, our business and financial results could be harmed.

We design and make complex products and they may contain undetected or latent errors or defects. Complex hardware and software systems, such as our products, can often contain undetected errors when first introduced or as new versions are released. In the past, we have experienced latent defects only discovered once the microinverters or batteries are deployed in the field. Changes in our supply chain or the failure of our suppliers to otherwise provide our third-party contract manufacturers with components or materials that meet our specifications could introduce defects into our products. As we grow our product volumes, the chance of manufacturing defects could increase. In addition, new product introductions or design changes made for the purpose of cost reduction, performance improvement, or improved reliability could introduce new design defects that may impact the performance and life of our products. Any design or manufacturing defects or other failures of our products to perform as expected could cause us to incur significant service and re-engineering costs, divert the attention of our engineering personnel from product development efforts and significantly and adversely affect installer and customer satisfaction, market acceptance and our business reputation. Furthermore, if we are unable to correct manufacturing defects or other failures of products in a manner satisfactory to our customers, our results of operations, customer satisfaction and our business reputation could be adversely affected.

In addition, due to the high energy density of lithium-ion cells, mishandling, inappropriate storage or delivery, non-compliance with safety instructions or field failures can potentially cause a battery cell to rapidly release its stored energy, which may in turn cause a thermal event that can ignite nearby materials, including other lithium-ion cells. As the use of lithium-ion batteries becomes more widespread, these events may occur more often, causing damage to property, injury, lawsuits and adverse publicity, which may adversely affect our reputation, results of operations or financial condition.

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. For example, we are highly dependent on our president and chief executive officer, Badrinarayanan Kothandaraman. Mr. Kothandaraman possesses technical knowledge of our business, operations and strategy, and he has substantial experience and contacts that help us implement our goals, strategy and plan. If we lose his services or if he decides to join a competitor or otherwise compete directly or indirectly with us, our business, operating results and financial condition could be materially harmed.

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 stock-based incentive awards, including 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 business and 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.

Additionally, our ability to attract qualified personnel, including senior management and key technical personnel, is critical to the execution of our growth strategy. Competition for qualified senior management personnel and highly skilled individuals with technical expertise is extremely intense, and we face challenges identifying, hiring and retaining qualified personnel in all areas of our business. In addition, integrating new employees into our team could prove disruptive to our operations, require substantial resources and management attention and ultimately prove unsuccessful. Our failure to attract and retain qualified senior management and other key technical personnel could limit or delay our strategic efforts, which could have a material adverse effect on our business, financial condition, results of operations and prospects.

Any failure by management to properly manage growth could have a material adverse effect on our business, operating results and financial condition.

Our business has grown rapidly, and, if our business develops as currently expected, we anticipate that we will continue to grow rapidly in the near future. Our expected rapid growth could place significant demands on our management, operations, systems, accounting, internal controls and financial resources, and it may also negatively impact our ability to retain key personnel. If we experience difficulties in any of these or other areas, we may not be able to expand our business successfully or effectively manage our growth. Any failure by management to manage our growth and to respond to changes in our business could have a material adverse effect on our business, financial condition and results of operations.

If we are unsuccessful in continuing to expand our direct-to-consumer sales channel by driving purchases through our website, our business and results of operation could be harmed.

Although we primarily sell our solutions and products directly to solar distributors, who resell to installers and integrators, who then in turn integrate our products into complete solar PV installations for residential and commercial system owners, we have recently invested significant resources in our direct-to-consumer sales channel through our website, and our future growth relies, in part, on our ability to attract consumers through this channel. Expanding our direct-to-consumer sales model will require significant expenditures in marketing, software development and infrastructure. Further, the success of direct-to-consumer sales through our website is also subject to general business regulations and laws, as well as federal, state, foreign and provincial regulations and laws specifically governing the internet and e-commerce. These regulations and laws may cover taxation, tariffs, privacy, data protection, pricing, distribution, electronic contracts and other communications, consumer protection and intellectual property. These laws and regulations can be complex, difficult to interpret and may change over time. Continued regulatory limitations and other obstacles interfering with our ability to sell our products directly to consumers could have a negative and material impact our business, prospects, financial condition and results of operations.

Further, the expansion of our direct-to-consumer channel could alienate some of our existing distributors and installers and cause a reduction in sales from these third parties. Our existing distributors and installers may perceive themselves to be at a disadvantage based on the direct-to-consumer sales offered through our website. Due to these and other factors, conflicts in our sales channels could arise and cause our existing distributors and installers to divert resources away from the promotion and sale of our products. If we are unable to successfully continue to drive traffic to, and increase sales through, our website, our business and results of operations could be harmed.