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

FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2023
OR

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

For the transition period from _________ to _________
Commission File Number: 001-38995

Sunnova Energy International Inc.

(Exact name of registrant as specified in its charter)

Delaware	**30-1192746**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification Number)**

20 East Greenway Plaza, Suite 540
Houston, Texas 77046
(Address, including zip code, of principal executive offices)

(281) 892-1588
(Registrant's telephone number, including area code)

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

Title of Each Class	Trading Symbol(s)	Name of Each Exchange on Which Registered
Common Stock, $0.0001 par value per share	NOVA	New York Stock Exchange

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

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

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

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

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

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

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

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

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

The aggregate market value of the common stock held by non-affiliates of the Registrant, based on the closing price of such shares of common stock of $18.31 as reported on the New York Stock Exchange on June 30, 2023 (the last business day of the Registrant's most recently completed second fiscal quarter), was approximately $2.1 billion.

The registrant had 122,484,286 shares of common stock outstanding as of February 19, 2024.

Portions of the information called for by Part III of this Form 10-K are hereby incorporated by reference from either the definitive Proxy Statement for our annual meeting of stockholders or an amendment to this Form 10-K, either of which will be filed with the Securities and Exchange Commission not later than 120 days after December 31, 2023.

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SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This report contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act"), and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"). Unless the context otherwise requires, the terms "Sunnova," "the Company," "we," "us" and "our" refer to Sunnova Energy International Inc. ("SEI") and its consolidated subsidiaries. Forward-looking statements generally relate to future events or Sunnova's future financial or operating performance. Actual outcomes and results may differ materially from what is expressed or forecast in such forward-looking statements. In some cases, you can identify these statements because they contain words such as "anticipate," "believe," "contemplate," "continue," "could," "estimate," "expect," "future," "goal," "intend," "likely," "may," "plan," "potential," "predict," "project," "seek," "should," "target," "will" or the negative of these words or other similar terms or expressions that concern our expectations, strategy, plans or intentions. Forward-looking statements contained in this report include, but are not limited to, statements about:

- federal, state and local statutes, regulations and policies;
- determinations of the Internal Revenue Service ("IRS") of the fair market value of our solar energy systems;
- the price of centralized utility-generated electricity and electricity from other sources and technologies;
- technical and capacity limitations imposed by operators of the power grid;
- the availability of tax rebates, credits and incentives, including changes to the rates of, or expiration of, federal tax credits and the availability of related safe harbors;
- our need and ability to raise capital to finance the installation and acquisition of distributed solar energy systems, refinance existing debt or otherwise meet our liquidity needs;
- our expectations concerning relationships with third parties, including the attraction, retention, performance and continued existence of our dealers;
- our ability to manage our supply chains and distribution channels and the impact of natural disasters and other events beyond our control;
- our ability to retain or upgrade current customers, further penetrate existing markets or expand into new markets;
- our investment in our platform and new product offerings and the demand for and expected benefits of our platform and product offerings;
- the ability of our solar energy systems, energy storage systems or other product offerings to operate or deliver energy for any reason, including if interconnection or transmission facilities on which we rely become unavailable;
- our ability to maintain our brand and protect our intellectual property and customer data;
- our ability to manage the cost of solar energy systems, energy storage systems and our service offerings;
- the willingness of and ability of our dealers and suppliers to fulfill their respective warranty and other contractual obligations;
- our expectations regarding litigation and administrative proceedings; and
- our ability to renew or replace expiring, canceled or terminated customer agreements at favorable rates or on a long-term basis.

Our actual results and timing of these events may differ materially from those anticipated in these forward-looking statements as a result of many factors, including but not limited to those discussed under "*Risk Factors*" and elsewhere in this Annual Report on Form 10-K. Moreover, we operate in a very competitive and rapidly changing environment and new risks emerge from time to time. It is not possible for our management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. In light of these risks, uncertainties and assumptions, the forward-looking events and circumstances discussed in this Annual Report on Form 10-K may not occur and actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements. We undertake no obligation to update publicly any forward-looking statements for any reason after the date of this Annual Report on Form 10-K to conform these statements to actual results or to changes in our expectations, except as required by law.

Summary of Risk Factors

The risk factors detailed in Item 1A entitled "*Risk Factors*" in this Annual Report on Form 10-K, are the risks we believe are material to our investors and a reader should carefully consider them. The following is a summary listing certain of the risk factors detailed in Item 1A:

Risks Related to Our Business

- Historically, we have incurred operating and net losses and we may be unable to achieve or sustain profitability in the future.
- Our growth and operations strategy depends on the continued origination of customer agreements by us and our dealers.
- Our growth and operations are dependent on our dealer network and our failure to retain or replace existing dealers or to grow our dealer network could adversely impact our business.
- We do not directly control certain costs related to our business, which could put us at a disadvantage relative to companies who have a vertically integrated business model.
- We may be unsuccessful in introducing new service and product offerings, including our distributed energy storage services and energy storage management systems.
- Our business is concentrated in certain markets, putting us at risk of region-specific disruptions.
- Certain of our solar energy systems are located in, and we conduct business in, Puerto Rico. Weakness in the fiscal health of the government and the Puerto Rico Electric Power Authority ("PREPA"), the damage caused by hurricanes, a series of earthquakes that affected the island in December 2019 and early 2020 and potential tax increases that may increase our cost of conducting business in Puerto Rico, create uncertainty that may adversely impact us. In addition, we are subject to administrative proceedings instituted by the Puerto Rico Energy Bureau ("PREB").
- The ongoing COVID-19 pandemic and future pandemics could adversely affect our business, financial condition and results of operations.
- Our operating results and our ability to grow may fluctuate from quarter to quarter and year to year, which could make our future performance difficult to predict and could cause our operating results for a particular period to fall below expectations.
- If our allowance for credit losses is not enough to cover actual credit losses from our customer notes receivable portfolio, our results of operations and financial condition could be negatively affected.
- Certain of our key operational metrics, including estimated gross contracted customer value, are based on various assumptions and estimates we make that cover an extended period of time. Actual experience may vary materially from these estimates and assumptions and therefore undue reliance should not be placed on these metrics.

Risks Related to the Solar Industry

- If sufficient additional demand for solar energy systems does not develop or takes longer to develop than we anticipate, our origination of solar service agreements may decrease.
- A material reduction in the retail price of electricity charged by electric utilities or other retail electricity providers would harm our business, financial condition and results of operations.
- Our business has benefited from the declining cost of solar energy system and energy storage system components and may be harmed to the extent the cost of such components stabilizes or increases in the future.
- We and our dealers depend on a limited number of suppliers of solar energy system components and technologies to adequately meet demand for our solar energy systems. Due to the limited number of suppliers in our industry, the acquisition of any of these suppliers by a competitor or any shortage, delay, price change, imposition of tariffs or duties or other limitation in our or our dealers' ability to obtain components or technologies we use could result in sales and installation delays, cancelations and loss of customers.
- Increases in the cost or reduction in supply of solar energy system and energy storage system components due to tariffs or trade restrictions imposed by the U.S. government could have an adverse effect on our business, financial condition and results of operations.
- Terrorist or cyberattacks against centralized utilities could adversely affect our business.
- We face competition from centralized electric utilities, retail electric providers, independent power producers and renewable energy companies.
- Developments in technology or improvements in distributed solar energy generation and related technologies or components may materially adversely affect demand for our offerings.

Risks Related to our Financing Activities

- We need to obtain substantial additional financing arrangements to provide working capital and growth capital. If financing is not available to us on acceptable terms when needed, our ability to continue to grow our business would be materially adversely impacted.
- Servicing our existing debt requires a significant amount of cash. We may not have sufficient cash flow from our business to

timely pay our interest and principal obligations and may be forced to take other actions to satisfy our payment obligations.
- Volatility and continued increases in interest rates would raise our cost of capital and may adversely impact our business.

Risks Related to Regulations

- We are not currently regulated as an electric public utility under applicable law but may be subject to regulation as an electric utility in the future.
- Electric utility policies and regulations, including those affecting electric rates, may present regulatory and economic barriers to the purchase and use of solar energy systems that may significantly reduce demand for electricity from our solar energy systems and adversely impact our ability to originate new solar service agreements.
- We rely on net metering and related policies to offer competitive pricing to our customers in most of our current markets and changes to net metering policies may significantly reduce demand for electricity from solar energy systems.
- Our business currently depends in part on the availability of rebates, tax credits and other financial incentives. The expiration, elimination or reduction of these rebates, credits or incentives or our ability to monetize them could adversely impact our business.
- Our business depends in part on the regulatory treatment of third-party owned solar energy systems.
- Technical and regulatory limitations regarding the interconnection of solar energy systems to the electrical grid may significantly reduce our ability to sell electricity from our solar energy systems in certain markets or delay interconnections and customer in-service dates, harming our growth rate, operations and customer satisfaction.
- Our business is subject to complex and evolving privacy and data protection laws. Many of these laws and regulations are subject to change and uncertain interpretation and could result in claims, increased cost of operations or otherwise harm our business.
- Our business is subject to consumer protection laws. Such laws and regulatory enforcement policies and priorities are subject to change that may negatively impact our business.
- The highly regulated environment in which our capital providers operate could have an adverse effect on our business.

Risks Related to Taxation

- Our ability to use net operating loss carryforwards ("NOLs") and tax credit carryforwards to offset future income taxes is subject to limitation and the amount of such carryforwards may be subject to challenge or reduction.
- Changes in tax law could adversely affect our business.
- If the IRS or the U.S. Treasury Department makes a determination that the fair market value of our solar energy systems is materially lower than what we have reported in our tax equity vehicles' tax returns, we may have to pay significant amounts to our tax equity vehicles, our tax equity investors, tax credit buyers and/or the U.S. government. Such determinations could have a material adverse effect on our business and financial condition.
- If our solar energy systems either cease to be qualifying property or undergo certain changes in ownership within five years of the applicable placed in service date, we may have to pay significant amounts to our tax equity vehicles, our tax equity investors, tax credit buyers and/or the U.S. government. Such recapture could have a material adverse effect on our business and financial condition.

Risks Related to Our Common Stock

- We do not intend to pay, and our credit facilities currently prohibit us from paying, cash dividends on our common stock and, consequently, your only opportunity to achieve a return on your investment is if the price of our common stock appreciates.
- Ownership of our common stock by current stockholders is expected to remain significant.
- The price of our common stock is volatile and may decline in value.
- Provisions of our charter documents and Delaware law may inhibit a takeover, which could limit the price investors might be willing to pay in the future for our common stock.

General Risk Factors

- We are exposed to the credit risk of our customers and payment delinquencies on our accounts receivable.
- Our actual financial results may differ materially from any guidance we may publish from time to time.
- If we are unable to make acquisitions on economically acceptable terms, our future growth and operations could be limited, and any acquisitions we may make may reduce, rather than increase, our cash flows.
- Adverse developments affecting the financial services industry, such as actual events or concerns involving liquidity, defaults or non-performance by financial institutions or transactional counterparties, could adversely impact our business, financial condition and results of operations.

PART I

Item 1. Business.

Mission

To power energy independence.

Overview

We are an industry-leading energy services company focused on making clean energy more accessible, reliable and affordable for homeowners and businesses, serving over 419,000 customers in more than 45 United States ("U.S.") states and territories. Through our adaptive energy platform, we provide a better energy service at a better price to deliver our mission of powering energy independence. Through our energy service offerings, we are disrupting the traditional energy landscape and the way the 21st century customer generates and consumes electricity. Additionally, we believe the renewable energy market in which we operate, and investment in climate solutions more broadly, will continue to grow as the impact of climate change increases. While our core business model seeks to help accelerate a global transition to renewable energy, there are inherent climate-related risks to our business operations including, but not limited to, those discussed under "*Risk Factors*" and elsewhere in this Annual Report on Form 10-K.

We partner with local dealers and contractors who originate, design and install our customers' solar energy systems, energy storage systems and related products and services on our behalf, as well as other sustainable home solutions, such as home security and monitoring, smart home devices, modern heating, ventilation and air conditioning ("HVAC"), generators, upgraded roofing, water systems, water heaters, main panel upgrades and electric vehicle chargers. Our focus on our dealer and contractor model enables us to leverage our dealers' and contractors' specialized knowledge, connections and experience in local markets to drive customer origination while providing our dealers and contractors with access to high quality products at competitive prices, as well as technical oversight and expertise. We believe this structure provides operational flexibility, reduces exposure to labor shortages and lowers fixed costs relative to true vertically integrated models.

We offer customers products to power and improve the energy efficiency and sustainability of their homes and businesses with affordable solar energy and related products and services. We are able to offer energy generation savings compared to utility-based retail rates with little to no up-front expense to the customer in conjunction with solar and solar plus energy storage products, and, in the case of the latter, are able to also provide energy resiliency. Our customer agreements typically take the form of a lease, power purchase agreement ("PPA"), loan or cash purchase; however, we also offer service plans for systems we did not originate. We make it possible in some states for a customer to obtain a new roof and/or other sustainable home products as part of their solar loan agreement or as an accessory loan to their lease or PPA. Customers who are not interested in a new solar energy system or energy storage system may also finance a new roof and other sustainable home products via a stand-alone loan from us. We also allow customers originated through our homebuilder channel the option of purchasing the products when the customer closes on the purchase of a new home. Service is an integral part of our agreements and includes operations and maintenance, monitoring, repairs and replacements, equipment upgrades, on-site power optimization for the customer (for both supply and demand), the ability to efficiently switch power sources between the solar energy system and/or energy storage system, and the grid, as appropriate, and also the solar energy system and energy storage system diagnostics. During the life of the contract, we have the opportunity to integrate related and evolving servicing and monitoring technologies and other sustainable home products to upgrade the flexibility and reduce the cost of our customers' energy supply.

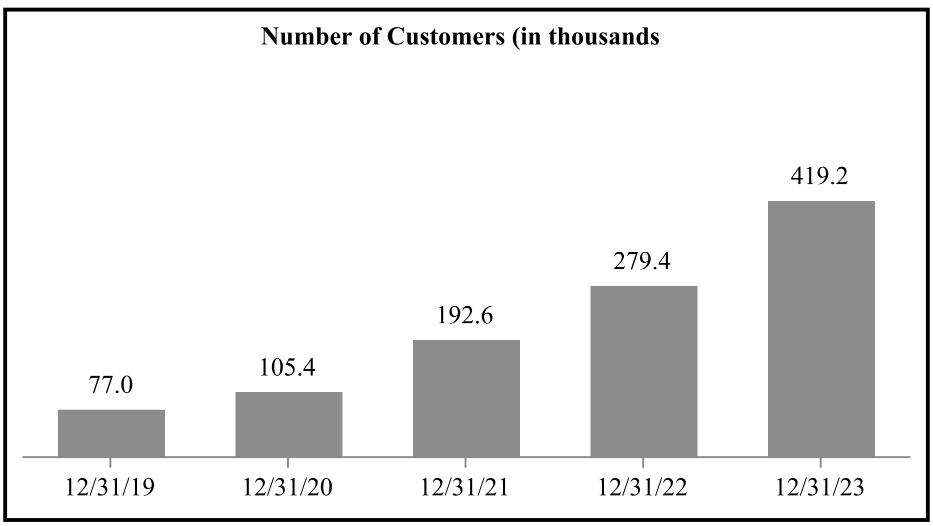
In the case of leases and PPAs, we also currently receive tax benefits and other incentives from federal, state and local governments, a portion of which we finance through tax equity, tax credit sales, non-recourse debt structures and hedging arrangements in order to fund our upfront costs, overhead and growth investments.

In addition to providing ongoing service as a standard component of our customer agreements, we also offer ongoing energy services to customers who purchased their solar energy system through third parties. Under these arrangements, we agree to provide monitoring, maintenance and/or repair services to these customers for the life of the service contract they sign with us. In addition, we offer one-time repair services to customers who purchased their solar energy systems or sustainable home products through third parties that are not otherwise covered by warranty. We also offer complementary products as well as non-solar financing. Specifically, our offerings include a non-solar loan program enabling customers to finance the purchase of products independent of a solar energy system or energy storage system. We believe the quality and scope of our comprehensive energy service offerings, whether to customers that obtained their solar energy system through us or through another party, is a key differentiator between us and our competitors.

We continue to expand our offerings to include additional sustainable home products to our agreements, including non-solar financing. Specifically, we have expanded our offerings to include a non-solar loan program enabling customers to finance the purchase of products independent of a solar energy system or energy storage system. We believe the quality and scope of our expanding sustainable home product offerings, whether to customers that obtained their solar energy system or energy storage system through us or through a third party, is a key differentiator between us and our competitors.

We also enter into leases with third-party owners of pools of solar energy systems to receive such third party's interest in those systems. In connection therewith, we assume the related customer PPA and lease obligations, entitling us to future customer cash flows as well as certain credits, rebates and incentives (including solar renewable energy certificates ("SRECs")) under those agreements, in exchange for a lease payment, whether upfront or over time, to the third-party owner, which may be made in the form of cash or shares of our common stock. We believe such arrangements enhance our long-term contracted cash flows and are complementary to our overall business model.

We commenced operations in January 2013 and began providing solar energy services under our first solar energy system in April 2013. Since then, our brand, innovation and focused execution have driven significant, rapid growth in our market share and in the number of customers on our platform. We operate one of the largest residential fleets of solar energy systems in the U.S., comprising more than 2,292 megawatts of generation capacity and our diversified offerings of sustainable home solutions serve over 419,000 customers as of December 31, 2023. For a discussion of how we define number of customers, see "*Management's Discussion and Analysis of Financial Condition and Results of Operations—Key Financial and Operational Metrics*". The following chart illustrates the growth in our number of customers from December 31, 2019 through December 31, 2023.



Our Network Model

While many of our competitors maintain a large, geographically diverse base of employees in local markets, including a direct sales force comprised of home improvement installers, we limit the cost associated with that structure by primarily utilizing a network of local, independent dealers and contractors to market, sell and install solar energy systems, energy storage systems, home generators and certain other products and services on our behalf. Our dealers and contractors typically reside and work within the markets they serve and provide a localized, customer-focused marketing, installation and servicing process. These dealers and contractors are often leading local solar installation companies, electrical services companies or companies that serve customers who are actively searching for solar power, backup power or complementary home services.

Origination, Installation, Monitoring and Servicing Processes

Through our network model, we provide a streamlined approach for the origination of customer agreements and the installation of solar energy systems, energy storage systems and other sustainable home products. The principal elements of our origination, installation, monitoring and servicing processes are described below:

- *Customer Origination and Consultation.* Our dealers and contractors serve as a local, direct-to-home sales force providing in-person and virtual consultations to source potential customers in each geographic market where we operate. Our dealers and contractors reach potential customers through various means, including online, telemarketing, in-store sales, cross-marketing with complementary products and door-to-door canvasing. Using our technology platform and proprietary pricing tool, the dealer/contractor and the customer select one of our standard-form agreements for the relevant market and product.

- *Design and Engineering*. We and the dealers work together to design the applicable equipment, such as the solar energy system and energy storage system, if applicable, prior to the dealer's purchase and installation. All of our solar energy systems and energy storage systems are designed with equipment from a pre-approved list of manufacturers. We utilize our extensive tools and services platform, standardized procedures and existing databases to help our dealers comply with our pricing requirements, solar best practices, contract terms, and state, territorial and local regulations. For each solar service agreement, an individualized power production estimate is created by analyzing geographic, solar and weather data with the design's proposed orientation, components and shading. We continue to pursue technological innovation to streamline our review of design and engineering, to expedite installation and to lower costs for our dealers.

- *Installation, Commissioning, Quality Assurance and Interconnection*. The installation phase requires the dealer to obtain all necessary permits for installation. For systems requiring commissioning, the dealer must complete our commissioning process for the solar energy system and energy storage system (as applicable), which entails submitting supporting documentation and photographs illustrating the installation of the solar energy system and energy storage system (as applicable) to our quality assurance team for review. Following completion of these steps and our approval of these materials, the dealer submits required paperwork to the applicable electric distribution utility to obtain permission to operate the equipment, schedule required regulatory inspections and arrange for interconnection of the solar energy system to the electrical grid. In some markets where either permission is not required and/or interconnection is not feasible or practical, we may place the system in service without interconnecting to the electrical grid and thereby place the system in service without seeking permission to operate from the applicable electric distribution utility.

- *Customer Billing Dates*. How soon we will begin billing the customer after the solar energy system or applicable sustainable home product system has been placed in service will vary by product offering. Lease agreements will begin billing on the first cycle date after the solar energy system or applicable sustainable home product system has been placed in service, generally within 30 days. PPAs will begin billing on the first cycle date in the next calendar month after the solar energy system has been placed in service, generally between 15 and 60 days after the solar energy system has been placed in service. Loan agreements require the solar energy system or applicable sustainable home product system must be in service at least 30 days or, where permitted by law, installed for 60 days prior to the date when billing can begin. As a result, billing on loan agreements generally begins with the aligned cycle date in the next calendar month after the solar energy system or applicable sustainable home product system has been installed or placed in service.

- *Monitoring and Servicing*. Our monitoring systems utilize cellular or internet connections that allow us to confirm the continuing operation of the solar energy system and energy storage system (if applicable) and with that information, solve maintenance issues through our dealers, third-party service providers or our own personnel. We also collect performance data to improve our pricing, generation estimates and services for our customers.

Our Relationships With Our Dealers and Contractors

We carefully recruit our dealers and contractors, who must meet and maintain our standards to be approved. Qualifications to be a dealer/contractor include: experience in the solar industry or success in an applicable sustainable home product industry such as home security, roofing, gas generators, heating, ventilation and air-conditioning, electrical services or water systems, experienced and appropriately certified employees (including multiple installation teams) and possession of applicable licenses. We also perform a review of the prospects' financial condition as part of our recruitment process, a background check on the principal owners of the organization and a careful review of the businesses online and local reputation. Upon engagement, the dealer/contractor enters into an agreement with us that sets ongoing standards for operations and payment obligations based on different milestones for each project. We provide training, field support and continuing education to help our dealers/contractors operate efficiently. This includes training related to our processes, standards and services platform, sales training and compliance education regarding applicable rules and regulations. We actively review our dealers'/contractors' performance and compliance with our requirements to determine whether to terminate our relationship with any dealer/contractor that is unable to meet our performance standards.

For the years ended December 31, 2023 and 2022, Trinity Solar, Inc. ("Trinity") accounted for approximately 10% and 19% of our net originations, respectively. In October 2022, we amended our agreement with Trinity pursuant to which Trinity has agreed to perform services or work exclusively for us for sixty-six months to March 31, 2028 (the "Exclusivity Period"), with certain exceptions, including (a) the sale of solar energy systems, energy storage systems, generators or electric vehicle chargers ("Agreed Products") to individuals on a "cash" basis that do not involve private financing marketed by Trinity, (b) the sale of Agreed Products to individuals who, based on their credit score(s) and other relevant attributes, Trinity reasonably determines do not qualify under our credit and underwriting standards then in effect and (c) the sale of Agreed Products pursuant to customer agreements executed prior to the date of the amendment to the dealer agreement. The amendment permits immaterial failures to comply with the foregoing exclusivity obligations provided that such failures are inadvertent, made without knowledge and/or intent of Trinity's management, and provided that such failures do not account for more than 2% of Trinity's installations in any single year during the Exclusivity Period. In addition, Trinity may install Agreed Products for our competitors in instances in which Trinity has available installation capacity, and, following notice to us that such capacity is available, we can either indicate that we do not intend to use such installation capacity or fail to timely respond to the notice. Trinity's exclusivity obligations do not apply to new roofs or roof replacements, or to Agreed Products sold for commercial applications. Under this arrangement, we have agreed to provide bonuses to Trinity in the amount of $12.9 million during the six month period ended March 31, 2023 and $30.0 million for each of the five subsequent year-long periods. The bonus payments are subject to a true-up payable by (a) us if Trinity exceeds 120% of its annual target or (b) Trinity if it does not meet at least 80% of its annual target, though we will not owe Trinity a true-up for its first year performance under any circumstances. The annual installation targets increase by approximately 2.3% to 7.1% each year. Unlike most of our dealer agreements, the arrangement with Trinity does not permit the parties to terminate for convenience and only permits termination in specified circumstances including material breach (subject to applicable cure periods), prolonged force majeure events, a change of control, certain insolvency events or mutual agreement. For purposes of the Trinity agreement, "change of control" means (a) the sale of all or substantially all of the assets of a party or (b) any merger, acquisition or other transaction or series of transactions that results in any "person" becoming the "beneficial owner" (as those terms are used in Section 13(d), Rule 13d-3 and Rule 13d-5 of the Exchange Act) of more than fifty percent of the voting securities of a party (subject to certain exclusions). Additionally, the arrangement provides for a liquidated damages payment of the greater of $50.0 million or the sum of all remaining annual bonus payments at the time of the termination by the applicable party in the event of termination for material breach, certain insolvency events of or wrongful termination by the other party.

We have similar contractual arrangements with several other key dealers and third parties. For certain other dealers and third parties, substantially all of the customer agreements originated by such dealers and third parties are Sunnova agreements, although they are under no exclusivity arrangement. During the year ended December 31, 2023, Monitronics International Inc. dba Brinks Home ("Brinks Home") and Lennar accounted for 30% and 10%, respectively, of our net originations. During the year ended December 31, 2022, Lennar and Windmar PV Energy, Inc ("Windmar Energy") accounted for 15% and 13%, respectively, of our net originations. No dealer or third party other than Brinks Home, Trinity, Lennar and Windmar Energy accounted for more than 10% of our net originations during 2023 or 2022.

Direct Sales

We have established a direct to market team to sell and install our products and services in limited markets. This sales team is primarily focused on selling solutions, such as Sunnova Protect Services, Sunnova +SunSafe and financing for electric vehicle chargers, generators and other supplements as requested by consumers. In many cases, these services will be directed to a third-party installer in our network, as required, for the installation of equipment.

Commercial Sector

We have established a division to serve commercial, industrial, agricultural, not-for-profit and public sector customers. This division is primarily focused on offering solutions, such as solar energy systems, energy storage systems and electric vehicle chargers as requested by customers, through a lease agreement, loan agreement or cash purchase.

Grid Services

We have developed relationships with various independent system operators, utilities, community choice aggregators and others, seeking to provide them with specialized grid services so these grid participants can more efficiently conduct their operations. Examples of these services include demand response as well as grid capacity. These grid programs can make use of the solar energy systems, energy storage systems and other technologies installed in customer homes and businesses and managed by us via a centralized platform and internally developed software. By providing grid services, we seek to earn additional revenue, improve grid resiliency and operations where our customers are located, and lower the cost of power to our customers.

Software Platforms

We have created sophisticated cloud-based technology platforms, streamlining the origination, installation, administration, orchestration and servicing of our energy solutions. Our proprietary dealer, customer and energy management software supports customers, dealers and internal users in the sale, installation and management of our products and services. The platforms leverage cloud-based infrastructure and software capabilities using multiple third-party providers, including Salesforce, Amazon Web Services, Heroku and FinancialForce. The platforms are compatible with multiple end-user device types, including smartphone, tablet and desktop/laptop interfaces.

Our key software platforms include:

- ***Sunnova Catalyst™ Dealer Platform***: Sunnova Catalyst enables dealers to manage leads, design systems, generate quotes and contracts, and create plan sets and commissioning packages through a combination of web, tablet and mobile device interfaces. As part of the quoting feature set, customer pricing is delivered by a combination of cloud-based technologies including Genability, PV Watts (a service of the National Renewable Energy Laboratory) and proprietary applications running on Amazon Web Services and Heroku. We enable dealers to generate customer agreements and proposal documents on demand for presentation to prospective customers. Each completed quote is transferred into Salesforce for agreement generation, customer access and reporting. Sunnova Catalyst also includes features to streamline the approval process for the design and installation of solar energy systems, track install progress and establish a standard process for ongoing service and warranty management.

- ***Sunnova App and Portal***: Sunnova App and Portal are our mobile and web experiences for customers. The mobile and web apps enable customers to interact with the Sunnova Adaptive Home. Customers can view their energy systems' production history, manage devices, pay bills, manage account and contact information, generate referrals and contact our customer service team. Sunnova App is available for both Android and iOS.

- ***Sunnova Sentient™:*** Sunnova Sentient is our proprietary platform for energy awareness, intelligence and control. Sunnova Sentient powers Sunnova Adaptive solutions for homes, businesses and communities. We are incorporating Sunnova Sentient into our dealer and customer platforms to recommend customer-specific energy solutions and optimize energy products and services. Sunnova Sentient powers our advanced grid services and carbon reduction programs.

- ***Salesforce***: Salesforce is our central repository and system of record for all contracts, process documentation, customer account information, maintenance information and payment tracking for the life of the customer agreement. This single system allows for integrated and comprehensive reporting for the life cycle of the customer, from quote to end of the customer agreement term. Many of our other systems interact with the Salesforce platform.

- ***FinancialForce***: FinancialForce is a cloud-based accounting system built on the Salesforce platform.

Customer Agreements

Sunnova Service	Agreement Type(s)	Sunnova Plan(s)	Description	Initial Term
Sunnova Home Solar Service	Lease	Easy Plan™ equipment lease	Lease of solar energy system	25 years
		LeasePlus™ New Home Solar Plan		20 or 25 years
		Prepaid LeasePlus™ New Home Solar Plan		
		Solar Benefits Agreement		20 years
	PPA	Easy Plan™ PPA	Sale of solar energy production	25 years
		Solar 20/20 Plan™ Agreement & Covenants		20 years
		Fixed Rate Power Purchase Agreement		
	Loan	Easy Own Plan™ equipment purchase	Sale of solar energy system	10, 15 or 25 years
Sunnova SunSafe® Solar + Battery Storage Service	Lease	Easy Plan™ equipment lease	Lease of solar energy system and energy storage system	25 years
	Loan	Easy Own Plan™ equipment purchase	Sale of solar energy system and energy storage system	10, 15 or 25 years
Sunnova +SunSafe® Add-on Battery Service	Loan	Easy Own Plan™ equipment purchase	Sale of energy storage system	10, 15 or 25 years
Standalone Lease	Lease	Easy Plan™ equipment lease	Lease of energy storage system	10 years
Sunnova Loan	Loan	Easy Own Plan™ equipment and services	Financing of home improvement products and services (including partial or full roof replacement) independent of a solar energy system	1 to 11 or 20 years
Sunnova Protect Service	Service Plan	Sunnova Protect Service	Monitoring and service agreements for non-Sunnova solar energy systems	1, 5, 10 or 20 years
Sunnova Repair Service	Repair Service	Sunnova Repair Service	Repair service agreements for Sunnova and non-Sunnova solar energy systems	1 year workmanship warranty
Accessory Purchase and/or Roof Replacement	Loan	Easy Own Plan™ equipment purchase	Home improvement products and services (including partial or full roof replacement) when combined with either a Home Solar Service or Sunnova SunSafe® Solar + Battery offering	10, 15 or 25 years

We focus on growing a geographically diverse customer base with a strong credit profile. We perceive our recurring customer payments as high-quality assets given the broad and relatively inelastic demand for electricity and because our customers typically have high credit scores. As of December 31, 2023, our customers had, at the time of signing the customer agreement, an average FICO® score of 741. The purpose of our stringent credit approval policy is to ensure reliability of collecting payment over the duration of the customer agreements. As of December 31, 2023, approximately 0.9% of our customers were in default (over 120 days past due) under their agreements.

Our lease and PPA agreements typically include an opportunity for customers to renew for up to an additional 10 years via two five-year or one 10-year renewal options. The customer is obligated to make monthly payments to us, and we operate and maintain the solar energy system and energy storage system, if applicable, in good condition throughout the duration of the agreement. Under our lease agreements and PPAs, the customer's monthly payment or price per kilowatt hour ("kWh") is set based on a calculation that takes into account the life of the equipment and/or expected solar energy generation. The customer has an option of choosing a flat rate without an escalator or a lower initial rate with an escalator. As of December 31, 2023, approximately 40% of our lease agreements and PPAs contained a price escalator, ranging from 0.9% to 3.9% annually.

Our customer agreements are designed to offer the customer energy cost savings and bill stability relative to centralized utility prices, often resulting in an immediate reduction in the customer's overall utility bill, with little or no upfront costs. We provide our services related to solar energy systems and energy storage systems through long-term agreements in the following formats:

- *Lease Agreements*. Under the Easy Plan equipment lease, the customer leases a solar energy system and/or energy storage system from us at a fixed monthly rate that is typically subject to annual escalation. Under the LeasePlus New Home Solar Plan, the customer leases a solar energy system from us at a fixed monthly rate that is not subject to escalation throughout the term of the lease. Under the Prepaid LeasePlus New Home Solar Plan, the lease is prepaid upfront for the term of the lease. The Solar Benefits Agreement is offered to customers in certain states and like the LeasePlus New Home Solar Plan, the customer leases a solar energy system from us at a fixed monthly rate that is not subject to escalation throughout the term of the lease. We own, operate and maintain the solar energy system under our lease agreements. In most cases, lease agreements include a performance guarantee under which we will refund payments or credit the customer if the solar energy system fails to meet a guaranteed minimum level of power production for specified time periods.

- *PPAs*. We offer PPAs with variable monthly payments or balanced monthly payments. We own, operate and maintain the solar energy system under our PPAs.

  - *Easy Plan PPA with variable billing*. The customer agrees to pay for all power generated by a solar energy system at a price per kWh that is generally lower than the local utility rate. The monthly payment will vary month to month based on the system's actual production. The monthly rate is generally subject to annual escalation.

  - *Easy Plan PPA with balanced billing*. This is similar to the variable billing option except the customer's payments are levelized over the course of a year based on an annual production estimate so the customer's payments are insulated from monthly fluctuations in energy production subject to a true-up at the end of such period. The fixed monthly rate is typically subject to annual escalation. Should the annual production estimate exceed actual production, the customer will receive a bill credit at the end of the applicable period and we may decrease the estimated production (and corresponding monthly payments) for the subsequent year. Should actual production exceed the annual estimate, we may apply the overproduction to a subsequent year or increase the estimated annual production and corresponding monthly payments for the subsequent year. The estimated annual production will not increase more than 110% from the estimated annual production for the first year.

  - *Solar 20/20 Plan Agreement & Covenants*. The customer agrees to pay for all power generated by a solar energy system at a price per kWh that is indexed to the local utility rate but is guaranteed to be at least 20% lower than the applicable utility's weighted-average rate that takes into account the customer's estimated production. The monthly payment will vary month to month based on the system's actual production and that month's indexed rate.

  - *Fixed Rate Power Purchase Agreement.* This is similar to the variable billing option except the monthly rate is fixed throughout the term of the agreement and not subject to annual escalation.

- *Loan Agreements*. Pursuant to an Easy Own Plan equipment purchase agreement, the customer purchases the solar energy system from a dealer using financing provided by us. The customer repays the amount financed plus a finance charge through monthly payments for a term of 10, 15 or 25 years. We purchase the Easy Own Plan equipment purchase agreement from the dealer and agree to operate and maintain the solar energy system. We operate and maintain the solar energy system through our network of dealers. In most cases, Easy Own Plan equipment purchase agreements include a production guarantee under which we will refund payments or credit the customer if the solar energy system fails to meet a guaranteed minimum level of power production for specified time periods. Customers under our Easy Own Plan equipment purchase agreements have the option to prepay outstanding principal amounts, in part or in full, without penalty.

- *Energy Storage Systems*. Our Sunnova SunSafe program offers customers the option of a solar energy system integrated with a solar storage system. The customer can either choose an Easy Plan equipment lease or Easy Own Plan equipment purchase plan. These are similar to our Easy Plan equipment lease and Easy Own Plan equipment purchase for home solar services but include energy storage systems with the solar energy system. The customer may select a term of 10, 15 or 25 years for the Easy Own Plan equipment purchase. These agreements have a production guarantee for the solar energy system, similar to the home solar service Easy Plan equipment lease and Easy Own Plan equipment purchase plans, except in Guam, Saipan, Hawaii, Puerto Rico, Arkansas and Florida. Additionally, we offer the Sunnova +SunSafe agreement to new and existing customers in several states and territories, under which the customer purchases an energy storage system from a dealer using financing provided by us. Under the Sunnova +SunSafe agreement, the customer repays the amount financed plus a finance charge through monthly payments for a term of 10, 15 or 25 years. In the fourth quarter of 2023, we launched our standalone lease program in several states to new and existing customers, under which the customer can lease an energy storage system with a fixed monthly payment for a term of 10 years.

- *Sunnova Loan*. We finance energy-related products and services and other sustainable home products sold by our dealers/contractors independent of a solar energy system. We offer customer financing for products including home security and monitoring, home automation, energy management and other smart home devices, upgraded roofing, modern HVAC, generators, water systems, water heaters, main panel upgrades and electric vehicle charging. We have established a niche amongst pure financing competitors by providing energy-related products and services and other sustainable home products with competitive rates and tenors. Where applicable, the financed products come with a standard manufacturer's warranty on equipment. Our Sunnova Loan offering gives our dealers and contractors the flexibility to offer additional products and services to customers outside of a traditional solar loan. Customers may select a pre-defined term ranging from 1 to 20 years.

- *Sunnova Protect Services*. For solar energy systems not owned or sold by us, our Sunnova Protect Services agreements provide customers maintenance and repairs as well as system monitoring and diagnostics. We provide two levels of service: (a) Basic, which is monitoring only and (b) Premium, which is monitoring plus repair and/or replacement of all equipment under a manufacturer's warranty. The customer may select the level of service and a term of 1, 5, 10 or 20 years. Prior to commencing coverage, we will run a diagnostic evaluation on the customer's solar energy system and will identify any underperforming equipment and estimate production. The customer may elect to repair underperforming equipment, on a time and materials basis, so that it may be included in the coverage going forward. Should the customer decline to repair the underperforming equipment, it will not be covered under the Sunnova Protect Services agreement.

- *Sunnova Repair Services*. Through our Sunnova Repair Services, we provide repairs to solar energy systems and energy storage systems for out of warranty system repairs or to owners of solar energy systems and energy storage systems not owned or sold by us who do not have a service provider. Additionally, Sunnova Repair Services can address repairs not covered by warranties for both solar energy systems and energy storage systems owned or sold by us and solar energy systems and energy storage systems not owned or sold by us. The variety of repairs that Sunnova Repair Services may provide includes assessment and troubleshooting, warranty administration, warranty fulfillment, preventative maintenance and repair and replacement of equipment. Additionally, suppliers and financiers procure Sunnova Repair Services for repairs on their behalf.

As of December 31, 2023, approximately 24% of our customers had lease agreements, approximately 24% had PPAs, approximately 37% had loan agreements and approximately 12% had service plan agreements.

We have developed protocols and policies to qualify potential customers for different product and service arrangements. For customer agreements, we review the customer's credit application for compliance with our credit standards early in the origination process. Customer agreements that are accepted must comply with our underwriting standards, which emphasize the prospective customer's ability to pay and the value of the customer's estimated savings under the solar service agreement compared to traditional utility rates. The customer agreement exceptions are solar service agreements of prospective purchasers of homes subject to the Easy Plan equipment lease, LeasePlus New Home Solar Plan, the Prepaid LeasePlus New Home Solar Plan, the Solar 20/20 Plan Agreement & Covenants and the Fixed Rate Power Purchase Agreement. These customers are not subject to credit checks and these agreements are freely transferable.

We maintain reporting and controls in place to monitor the timeliness of customer payments. As of December 31, 2023, approximately 86% of all payments received pursuant to our customer agreements are collected via Automated Clearing House payments (i.e., the funds are deducted automatically on a monthly basis from the customer's bank account), approximately 8% are collected via automatic recurring credit card payments and approximately 6% are collected through non-recurring means. If a customer becomes delinquent on one or more monthly installment payments, we typically begin a collection process with respect to the customer.

In the event a customer elects to sell his or her home or business, the customer's agreement may be transferred to the prospective purchaser through prescribed reassignment procedures, subject to certain conditions related to the prospective purchaser's creditworthiness. To initiate the reassignment process, the customer must notify us of the pending sale, after which we will provide a copy of the agreement, including any amendments, to the prospective purchaser. The prospective purchaser will then be required to complete a customer profile and a credit application. With the exception of customers originated through our homebuilder channel, each prospective purchaser's FICO® Score and Experian TEC (Telecommunications, Energy and Cable) Score will be evaluated on the same basis as a customer in a new origination and will be evaluated by our computer auto-decisioning system.

In the event a prospective purchaser does not meet our credit criteria or elects not to be subject to such credit inquiry, the current customer will be required to prepay the agreement in full or the prospective purchaser will be required to provide a security deposit in cash in accordance with such customer's agreement or our transfer policy prior to the approval of the reassignment. Each such security deposit is held in a separate account until the earlier of (a) the time at which the prospective purchaser satisfies our established credit criteria or (b) upon 12 consecutive months of on-time payments following the date of reassignment.

Monitoring and Maintenance Service and Warranties

Our customer agreements typically are accompanied by a warranty and/or monitoring and service agreement. The warranty and monitoring services provided with each type of customer agreement vary but can include operations and maintenance, equipment repairs, monitoring or site power controls and energy management of both supply and demand. Additionally, our Sunnova Protect program offers monitoring, service and facilitation of repairs across two tiers of service for solar energy systems owned by the home or business owner and installed by a third party.

For our customer agreements, we provide ongoing service during the entire term of the customer relationship, including monitoring, maintenance and warranty services of the solar energy system and energy storage system, if applicable. We have an operations and maintenance administration organization consisting of administration staff and a dedicated monitoring and production team that evaluates the solar energy systems' and energy storage systems' performance daily. When a performance or operation issue is detected via our monitoring system, we provide or arrange for troubleshooting or field services as necessary. We rely on our own personnel and our dealer network to complete the field services required to maintain the solar energy systems. After completion of the resolution steps, the maintenance administration organization verifies remotely the issue has been resolved and the system or energy service is performing as expected. For accessory loan agreements, we do not provide ongoing monitoring, warranties or similar services.

Additionally, customers under our agreements receive a range of warranties on the related solar energy systems and energy storage systems, including warranties for module production and against defects in workmanship and against component or materials breakdown. We also provide the customers with a warranty on roof penetrations of up to 10 years in compliance with applicable state, territorial or local law. Through our agreements with our dealers, the dealer is generally obligated, at its sole cost and expense, to correct defects in its installation work for a period of up to 10 years and provide a roof warranty on roof penetrations of 5 to 10 years. Furthermore, we provide a pass-through of the solar photovoltaic panel manufacturers' warranty coverage to our customers, generally of 25 years, and of the inverter and energy storage system manufacturers' warranty coverage, typically of 10 to 25 years. We typically exercise our rights under the manufacturer's equipment warranties or dealer installation warranties before incurring direct charges or costs. Many service expenses are borne by our dealers and not us directly because of the workmanship warranty provided by the dealers to us. Additionally, many component costs and, in many cases, in and out labor costs, are covered by manufacturer warranties.

Seasonality

The amount of electricity our solar energy systems produce is dependent in part on the amount of sunlight, or irradiation, where the assets are located. Because shorter daylight hours in winter months and poor weather conditions due to cloud cover, rain or snow results in less irradiation, the output of solar energy systems will vary depending on the season or the year. While we expect seasonal variability to occur, the geographic diversity in our assets helps to mitigate our aggregate seasonal variability.

Our Easy Plan PPAs with variable billing, Solar 20/20 Plan Agreements and Fixed Rate Power Purchase Agreements are subject to seasonality because we sell all the solar energy system's energy output to the customer at either a fixed price per kWh or indexed, variable rate per kWh. Our Easy Plan PPAs with balanced billing are not subject to seasonality (from a cash flow perspective or the customer's perspective) within a given year because the customer's payments are levelized on an annualized basis so we insulate the customer from monthly fluctuations in production. In addition, energy production true-ups and production estimate adjustments for Easy Plan PPAs with balanced billing are calculated over an entire year. However, our Easy Plan PPAs with balanced billing are subject to seasonality from a revenue recognition perspective because, similar to the Easy Plan PPAs with variable billing, we sell all the solar energy system's energy output to the customer. Our lease agreements are not subject to seasonality within a given year because we lease the solar energy system to the customer at a fixed monthly rate and the reference period for any production guarantee payments is a full year. Finally, our loan agreements are not subject to seasonality within a given year because the monthly installment payments for the financing of the customers' purchase of the solar energy system are fixed and the reference period for any production guarantee is a full year.

In addition, weather may impact our dealers' ability to install solar energy systems and energy storage systems. For example, the ability to install solar energy systems and energy storage systems during the winter months in the Northeastern U.S. is limited. This can impact the timing of when solar energy systems and energy storage systems can be installed and when we can acquire and begin to generate revenue from solar energy systems and energy storage systems.

Intellectual Property

We rely on intellectual property laws, primarily a combination of copyright and trade secret laws in the U.S., as well as license agreements and other contractual provisions, to protect our proprietary technology. We also rely on several registered and unregistered trademarks to protect our brand. In addition, we generally require our employees and independent contractors involved in the development of intellectual property on our behalf to enter into agreements to limit access to, and disclosure and use of, our confidential information and proprietary technology. We also continue to expand our technological capabilities through licensing technology and intellectual property from third parties.

Government Regulations

While we are not regulated as extensively as a public utility where our business is conducted in the U.S., we are subject to various national, state, territorial and other local regulatory regimes. For example, in California and New York, we are subject to regulations concerning marketing and contracting promulgated by state public utility commissions. In some states, such as Arizona and Florida, we are limited to offering only a lease agreement or a loan agreement to homeowners and are prohibited from offering a PPA, which is deemed a retail sale of electricity in such states and can only be made by a regulated utility. In Puerto Rico, we are subject to regulation as an electric power company by the PREB and are required to comply with certain filing, certification, reporting and annual fee requirements. Regulation by the PREB as an electric power company does not currently subject us to centralized utility-like regulation or require the PREB's approval of charges to customers.

To operate the solar energy systems and energy storage systems, our dealers work with customers to obtain interconnection permission from the applicable local electric distribution utility. In many states and territories, by statute, regulations or administrative order, there are standardized procedures for interconnecting distributed solar energy systems and related energy storage systems to the electric utility's local distribution system. In some states, such as New Jersey and Massachusetts, certain utilities, such as municipal utilities or electric cooperatives, are exempt from some interconnection requirements. Provided that the system and energy, if applicable, qualify for the standardized procedures based upon size, use of industry-standard components, location on a suitable local network and other applicable requirements, utilities in such states or territories are required to interconnect qualifying solar energy systems and energy storage systems on an expedited basis relative to non-qualifying systems. Expedited procedures, when available, streamline the installation and interconnection process for solar energy systems and energy storage systems to begin operating. In the U.S. states and territories in which we operate, our dealers typically obtain interconnection permission on behalf of us and our customers using standardized interconnection procedures.

In certain states, independent solar energy producers who enter into lease agreements, PPAs or loan agreements with home and business owners for solar energy systems are required to make certain disclosures to the home or business owner regarding the solar energy system and the terms of the agreement and/or record a notice against the title to the real property on which the electricity is generated and against the title to any adjacent real property on which the electricity will be used. The notice does not constitute a title defect, lien or encumbrance against the real property.

Our operations, as well as the operation of our dealers and contractors, are subject to stringent and complex federal, state, territorial and local laws, including regulations governing the occupational health and safety of employees, regulations of wages and benefits and environmental protection. For example, we and our dealers/contractors may be subject to the regulations of the U.S. Department of Labor's Occupational Safety and Health Administration ("OSHA") and Wage and Hour Division, the U.S. Department of Transportation ("DOT"), the U.S. Environmental Protection Agency ("EPA") and comparable state and territorial entities that protect and regulate employee health and safety and the environment. These include, for example, regulations regarding the disposal of solid and hazardous wastes from the solar energy systems we own and the wages paid to our dealers and contractors. In addition, environmental laws can result in the imposition of liability in connection with end-of-life system disposal, such as in connection with disposal and recycling of batteries.

We and our dealers/contractors are also subject to laws and regulations related to interactions with consumers, including those pertaining to sales and trade practices, privacy and data security, equal protection, consumer financial and credit transactions, consumer collections, mortgages and re-financings, home or business improvements, trade and professional licensing, warranties and various means of customer solicitation, as well as specific regulations pertaining to solar installations.

For a discussion of these and other regulatory requirements, see "*Risk Factors—Risks Related to Regulations*".

Government Incentives

In September 2023, we entered into a loan guarantee arrangement with the U.S. Department of Energy (the "DOE") under Title XVII of the Energy Policy Act of 2005 ("Title XVII") pursuant to which the DOE has agreed, subject to certain conditions, to guarantee up to $3.0 billion of aggregate obligations in a series of intercompany loans between our affiliates made in connection with limited recourse financings, such as the Sunnova Hestia Loan Program. Recipients of Title XVII loan guarantees may be subject to compliance with various additional federal law and contractual requirements, such as the Davis-Bacon Act and the False Claims Act, as well as the statutory and regulatory requirements of Title XVII. In November 2023, we have been conditionally selected by the DOE Grid Deployment Office as part of a $440 million investment from the Puerto Rico Energy Resilience Fund to install rooftop solar energy systems and energy storage systems in vulnerable single-family households across Puerto Rico.

U.S. federal, state, territorial and local governments have established various incentives and financial mechanisms to reduce the cost of solar energy and to accelerate the adoption of solar energy. These incentives come in various forms, including rebates, tax credits and other financial incentives such as payments for renewable energy credits associated with renewable energy generation, exclusion of solar energy systems and energy storage systems from property tax assessments, system performance payments, accelerated depreciation and net energy metering, or net metering, programs. These incentives make solar energy system and energy storage system ownership more attractive to some home and business owners and enable us to charge our customers lower prices to purchase energy generated by our solar energy systems and energy storage systems or to lease or purchase our solar energy systems and energy storage systems than they would normally be expected to pay for utility-provided energy. These incentives also help catalyze private sector investments in solar energy and efficiency measures, including the installation and operation of residential and commercial solar energy systems and energy storage systems.

Net metering is one of several key policies that have enabled the growth of distributed solar in the U.S., providing significant value to certain customers with solar energy systems for the electricity generated by their systems but not directly consumed on site. Net metering allows a customer to pay the local electric utility only for power usage net of excess production from the customer's solar energy system. Customers receive a credit for the energy an interconnected solar energy system generates in excess of that needed by the home or business, which is provided to the electrical grid. The credit offsets energy usage incurred by the customer at times when the customer requires more electricity than is generated by the solar energy system. In many markets, this credit is equal to the residential retail rate for electricity and in other markets the rate is less than the retail rate and may be based, for example, in whole or in part on the centralized electric utility's "avoided cost" for electricity that it would have had to generate or purchase at wholesale to meet the customer's demand. Furthermore, when coupled with a time of use rate program in certain electric utility territories, a home or business owner may offset usage billed at lower rates with net metering credits provided at a higher rate.

For these reasons, net metering credits incentivize consumers to use distributed solar in certain jurisdictions, including some of those in which we operate. In some electric utility territories, any excess credits are rolled over to the next billing period and may also be cashed out later at a rate lower than the retail rate. Most states, the District of Columbia, Puerto Rico and Guam have adopted some form of net metering by statute, regulation, administrative order or a combination thereof, although some of these jurisdictions provide for a credit at less than the retail rate. In some jurisdictions, centralized electric utilities have also adopted net metering on a voluntary basis. Some of the states in which we operate, including New Jersey, Maryland, Massachusetts, Rhode Island, Delaware, Illinois and Hawaii, have in place policies that limit or permit utilities to limit the amount of total electricity generated through net metering and/or solar energy systems, and some of these states, as well as other states or territories, including Pennsylvania, Nevada, New Mexico and Guam, have policies that limit or place conditions on the size of individual solar energy systems.

Net metering and other incentive programs are subject to legislative and regulatory review in many states and territories in which we operate, and the availability and value of these programs could be limited, reduced or phased out. Some states such as Arizona, Nevada, California and Kentucky have reduced their net metering credits. Further reviews by these states and others are anticipated and the subsequent amount of net metering credits will continue to be assessed over the next few years in states that have net metering policies. For example, net metering rates in Colorado, New Jersey, Puerto Rico and South Carolina are up for consideration currently or over the next few years.

In December 2022, the California Public Utility Commission (the "CPUC") approved a successor program (Net Energy Metering 3.0 or "NEM 3.0")to its current net metering program that reduces the value of net metering credits from the retail rate to an avoided cost rate for customers that will have solar energy systems installed on their homes and businesses over the next five years. Customers will also be placed on an electrification rate. Residential customers located in the territories of two of the investor-owned utilities will also receive small adders to the avoided cost rate, while the residential customers in the territory of the third investor-owned utility, as well as new homes and commercial customers in all three of the service territories, do not receive any adders. In addition, it may only be possible for customers to realize savings from installing solar energy systems compared to the utility retail rate by adding storage to their solar energy systems or undersizing them so exports are limited. The decision went into effect in April 2023.

New York is working on developing an alternative to net metering through a Value of Distributed Energy Resources credit that would allow certain customers to receive direct monetary compensation as opposed to a net metering credit. This program was expected to be implemented in 2021 but has been delayed due to not enough utilities having deployed smart meters that would enable an accurate valuation of distributed energy production. New York is keeping net metering in place with a nominal customer benefit charge added for solar customers who have solar energy systems installed after January 1, 2022. As a result of the Definitive Restructuring Support Agreement ("DRSA") between the PREPA and its creditors submitted in May 2019, which is currently pending before the U.S. District Court for the District of Puerto Rico, net metering customers in Puerto Rico may be impacted by transition charges and other requirements. Several legislators publicly oppose the DRSA and negotiations on the DRSA continued throughout 2023.

In September 2020, the Federal Energy Regulatory Commission ("FERC") issued Order 2222 directing regional transmission operators ("RTO") and independent system operators ("ISO") to remove barriers to the participation of distributed energy resources ("DERs") in wholesale electricity markets on an aggregated basis. While the FERC's order is subject to challenge as well as further proceedings concerning the implementation of the order's directives in each of the RTOs/ISOs, Order 2222 provides a framework that once implemented will allow for aggregated DERs to be compensated through the wholesale market for the capacity, energy and ancillary services they provide.

In late 2020, we began offering our lease storage customers participation in the ConnectedSolutions demand response program through Eversource and National Grid utilities in Massachusetts. We expanded these offerings for our Connecticut, Rhode Island and New Hampshire customers in early 2021, including loan storage customers. Our storage customers in California have the option to participate in the demand response market to help California manage its electricity demand, where we manage the battery storage system in response to price signals in the energy market for customers served by Pacific Gas and Electric Company, San Diego Gas & Electric utilities and Southern California Edison to provide demand response and resource adequacy. In late 2023, we expanded our Sunnova Sentient Virtual Power Plant Platform to Puerto Rico to participate in LUMA Energy, LLC's battery energy sharing program. Further, we will seek to participate in market specific opportunities and negotiate bilateral agreements, where appropriate, to enroll systems and customers in energy management and demand response programs.

Many states and territories have adopted renewable portfolio energy production requirements. The majority of states, the District of Columbia and Puerto Rico have adopted a renewable portfolio standard ("RPS") that requires regulated electric utilities to generate or procure a specified percentage of total electricity delivered to customers in the state or territory from eligible renewable energy sources, such as solar energy systems, by a series of specified dates. In addition, several other states have set voluntary goals for renewable generation.

Roughly one-third of states with RPS policies require a minimum portion of the RPS be met by electric generation from solar energy systems, with substantial penalties for non-compliance. To demonstrate compliance with such RPS mandates, electric generation providers must submit SRECs to the applicable authority. One SREC is produced by one megawatt-hour of energy generated by an eligible solar energy system. The specified amount of energy is dependent on system size and when the solar energy system receives a "permission to operate" order. Electric generation providers can either generate their own SRECs through solar energy systems they own or they can purchase SRECs owned by other parties.

SRECs are a distinct product, separate from the electricity generated by solar energy systems. We and our customers apply for and receive SRECs in certain jurisdictions for power generated by the solar energy systems we own. As a distinct product from the electricity generated by solar energy systems, SRECs represent a separate source of cash flow from the sale of electricity. SRECs can be sold with or without the actual electricity associated with the renewable-based generation. Solar energy system owners are typically able to sell SRECs to electric generation providers, such as electric utilities, or in the SREC commodity market. We have hedged a portion of our expected SREC production under fixed price forward contracts. The forward contracts require us to physically deliver the SRECs upon settlement.

Several states have an energy storage mandate or policies designed to encourage the adoption of storage. For example, California offers a cash rebate for storage installations through the Self Generation Incentive Program and Massachusetts and New York offer performance-based financial incentives for storage. Storage installations also are supported in certain states by state public utility commission policies that require utilities to consider alternatives such as storage before they can build new generation. In February 2018, the FERC issued Order 841 directing RTOs and ISOs to remove barriers to the participation of storage in wholesale electricity markets and to establish rules to help ensure storage resources are compensated for the services they provide. An appeal of Order 841 filed by utility trade associations and other parties challenging the extent of the FERC's jurisdiction over storage resources connected to distribution systems was rejected by the U.S. Court of Appeals for the D.C. Circuit in July 2020.

Some state and territorial governments, centralized electric utilities, municipal utilities and co-operative utilities offer a cash rebate or other payment incentive for the installation and operation of a solar energy system or energy storage system or to customers undertaking other energy efficiency measures. Capital cost or "up-front" rebates provide funds to solar customers or developers or solar energy system owners, such as us, based on the cost, size or expected production of a customer's solar energy system. Performance-based incentives and tariff-based incentives provide payments to solar customers or a solar energy system owner based on the energy generated by the solar energy system during a pre-determined period. These rebates and payment incentives, when available, improve the economics of distributed solar to both us and our customers.

The economics of purchasing a solar energy system and energy storage system are also improved by eligibility for accelerated depreciation, which allows for the depreciation of equipment according to an accelerated schedule set forth by the IRS. This accelerated schedule allows a taxpayer to recognize the depreciation of tangible solar property on a five-year basis even though the useful life of such property is greater than five years. The acceleration of depreciation creates a valuable tax benefit that increases the return on investment from a solar energy system and energy storage system. We benefit from accelerated depreciation on the solar energy systems and energy storage systems we own.

The federal government currently provides business investment tax credits under Section 48(a) (the "Section 48(a) ITC") and, for projects that begin construction after December 31, 2024, under Section 48E (the "Section 48E ITC") as well as residential energy credits under Section 25D (the "Section 25D Credit") of the U.S. Internal Revenue Code of 1986, as amended (the "Code"). In August 2022, the Inflation Reduction Act of 2022 (the "IRA") was signed into law. Among other things, the IRA expanded and extended the tax credits available to solar energy projects in an effort to achieve President Biden's non-binding target of net-zero emissions by 2050. The IRA extended the investment tax credit for eligible solar energy projects through at least 2033 and, depending on the location of a particular project, its size, its ability to satisfy certain labor and domestic content requirements and the category of consumers it serves, the investment tax credit percentage can range between 6% and 70%. For projects that begin construction after December 31, 2024, the Section 48(a) ITC will be replaced with the Section 48E ITC, a new clean energy investment tax credit, and the Section 48E ITC percentage will be the same as the percentage for the Section 48(a) ITC and subject to the same requirements to benefit from the full 30%. Following passage of the IRA, retroactive to the beginning of 2022, we are able to claim the Section 48(a) ITC or the Section 48E ITC, as applicable, for energy storage systems whether attached to a solar energy system or stand-alone.

The IRA also extended the Section 25D Credit, which allows qualifying homeowners who purchase a residential solar energy system and/or energy storage system to apply up to 30% of the cost of installing those systems as a credit against their U.S. federal income taxes, thereby returning a material portion of the purchase price of the residential solar energy system and/or energy storage system to homeowners. Under the terms of the current extension, the Section 25D Credit will remain at 30% through the end of 2032, reduce to 26% for 2033, reduce to 22% for 2034 and further reduce to 0% after the end of 2034, unless it is extended before that time.

Certain states and territories in which we operate offer a personal and/or corporate investment or production tax credit for solar energy. Further, most of the states and local jurisdictions have established sales and/or property tax incentives for renewable energy systems that include exemptions, exclusions, abatements and credits. For a discussion of these and other governmental incentives, see "*Risk Factors—Risks Related to Regulations*".

Competition

We believe our primary competitors are centralized electric utilities that supply electricity to our potential customers. We compete with these centralized electric utilities primarily based on price (cents per kWh), predictability of future prices (by providing pre-determined annual price escalations, where applicable), reliability and the ease by which customers can switch to electricity generated by solar energy systems. We believe we compete favorably with centralized electric utilities based on these factors in the states and territories where our customer agreements are offered.

We also compete with retail electric providers and independent power producers that are not regulated like centralized electric utilities but have access to the centralized utilities' electricity transmission and distribution infrastructure pursuant to state, territorial and local pro-competitive and consumer choice policies. Furthermore, we compete with solar companies with vertically integrated business models, such as Sunrun Inc. and SunPower Corporation. In addition, we compete with other solar companies who sell or finance products directly to consumers, inclusive of programs like Property-Assessed Clean Energy, such as Goodleap, LLC and Mosaic, Inc. For example, we face competition from solar installation businesses that seek financing from external parties or utilize competitive loan products or state and local programs. In the future, we may also compete with solar companies that have business models similar to our own, some of which are marketed to potential customers by our dealers and contractors. We compete with these companies based on the competitiveness of the products, the overall customer relationship and the commissions we are willing to pay dealers and contractors for the origination of new customers.

Suppliers

The major components of the solar energy systems include (a) solar photovoltaic panels that turn sunlight into direct current ("DC") electricity, (b) inverters that convert solar-generated DC electricity into alternating current ("AC") electricity, the form of energy used by most standard household appliances, (c) racking systems that attach the solar photovoltaic panels to the roof or ground, (d) a remote monitoring system that measures and monitors all energy generated by the solar energy system and provides alerts about system performance and (e) in some cases, an energy storage system that stores excess energy generated by the photovoltaic panels to supplement energy supply during hours when energy consumption exceeds energy produced by the photovoltaic panels or in the event of a grid outage. The solar energy system may also be connected to the electrical grid or other supplemental energy sources, such as electric vehicle chargers, smart load controllers or panels and generators, with additional wiring and electrical hardware.

We require our dealers to choose all major components of the solar energy system or energy storage system from a pre-approved list of manufacturers and models. By allowing dealers to choose from several manufacturers and models without direct supplier obligations, we have greater flexibility to satisfy customer demand, ensure competitive pricing and adequate supply of components and reduce the concentration of warranty risks. We have entered into master contractual arrangements with each vendor on our pre-approved list of vendors that defines the general terms and conditions of our purchases and those of our dealers, including warranties, product specifications, indemnities, delivery and certain other terms. Our dealers typically purchase solar panels and inverters on an as-needed basis from our pre-approved suppliers at then-prevailing prices pursuant to purchase orders having the benefit of our master contractual arrangements. At times, we will also procure equipment directly and sell it to our dealers.

For installations of solar energy systems on new homes or businesses, we negotiate pricing directly with the manufacturers for all components used in the solar energy systems. Based upon our production planning model, we position and deliver the material on a just-in-time basis to our dealers to meet the builder requirements.

We evaluate and qualify our manufacturers and their product offerings based on total cost of ownership, reliability, warranty coverage, credit quality and other factors. All equipment must be listed on the California Energy Commission's SB1 List of Eligible Equipment. All approved solar photovoltaic panels must have a minimum 25-year power warranty and 25-year workmanship warranty. We also require approved solar photovoltaic panels to undergo extended reliability testing as an indication of a 25-year or greater lifetime. Beginning in April 2016, we required all our manufacturers carry a 25-year warranty, or offer a warranty extension to 25 years, on all product offerings to be eligible for inclusion on our approved vendor list. Prior to April 2016, we sourced inverter manufacturers offering a warranty of no less than 10 years. All approved racking systems are required to be solar energy system Fire Class Rated "A" with a Type 1 module per California Fire requirements. Additionally, the racking system must have a Professional Engineers stamp as proof of structural analysis and wind speed certification and the racking system must be certified as conforming to the integrated grounding and bonding requirements of UL Subject 2703. All replacement parts and components must meet or exceed the same standards as those of the original installation.

In September 2018, the Office of the United States Trade Representative ("USTR") determined to modify its prior actions in its investigation into certain acts, policies and practices of the government of China related to technology transfer, intellectual property and innovation pursuant to Section 301 of the Trade Act of 1974 by imposing an additional 10% duty on $200 billion worth of products from China, including inverters. In May 2019, the tariffs were increased from 10% to 25% and may be raised by the USTR in the future. If inverter production is not shifted to other countries before any tariff rate increase on these products, the price of inverters could increase. However, the cost of solar photovoltaic panels and inverters generally do not comprise a meaningful portion of our operating expenses. In addition, many of the solar photovoltaic panel and inverter manufacturers on our approved vendor list are from countries other than China, including Canada, the U.S., Mexico, Vietnam and Malaysia. See "*Risk Factors—Risks Related to the Solar Industry—Increases in the cost or reduction in supply of solar energy system and energy storage system components due to tariffs or trade restrictions imposed by the U.S. government could* *have an adverse effect on our business, financial condition and results of operations".* These tariffs have not had a material impact on our business or our operations.

Human Capital Management

At Sunnova, our unwavering commitment to service, synergy and sustainability shapes our approach to human capital management. These core values not only reflect our belief in providing better energy service to the communities we service but also underscore our dedication to the well-being and development of our employees. Our governance framework, led by our board of directors (our "Board") and its committees, is structured to align human capital management with our broader business objectives. This includes rigorous oversight of inclusion and diversity programs, employee development, performance management, compensation and succession planning. Our audit committee collaborates closely with our enterprise risk management function to identify and mitigate labor and human capital risks.

By embracing the diversity of our customers, employees and communities, we are committed to creating an inclusive environment that reflects a spectrum of backgrounds and cultures. Our initiatives focus on enhancing attraction, retention and advancement of a diverse workforce, ensuring our team represents the communities we serve. We place a high premium on the continuous training and development of our employees. Our employee training and development programs span e-learning, classroom training, performance management and leadership initiatives. Regular employee surveys provide valuable insights, helping us refine our attraction, retention and advancement strategies and enhance employee engagement. Safety is of paramount importance at Sunnova. Our objective of zero workplace injuries drives our comprehensive safety programs, which include protocols for various operational risks. The well-being of our employees is further supported by comprehensive benefits that protect their health, financial security and foster a sense of ownership through stock incentive programs.

As of December 31, 2023, our dynamic team comprised of 2,047 employees and is a reflection of our growth and commitment to creating jobs in clean energy. We value our relationships with all our employees, are not party to any collective bargaining agreements, have not experienced any strikes or work stoppages and maintain a focus on positive employee relations. We encourage open dialogue and transparency, with our CEO regularly engaging in townhall meetings to discuss operational results and address employee queries. Additionally, our anonymous hotline ensures employees can voice concerns regarding compliance and ethics comfortably. Sunnova's future is intricately linked with our human capital management. Our focus on integrating our core values into every aspect of employee experience underpins our goal of advancing the energy industry through collaboration, ownership and empowerment. As we continue to grow, our commitment to our employees remains central to our mission to power energy independence.

Insurance

We maintain the types and amounts of insurance coverage we believe are consistent with customary industry practices. Our insurance policies cover employee and contractor-related accidents and injuries, property damage, business interruption, storm damage, inventory, vehicles, fixed assets, facilities, cyber risk, crime and general liability deriving from our activities. Our insurance policies also cover directors, officers, employment practices and fiduciary liabilities. We may also be covered for certain liabilities by insurance policies owned by third parties, including, but not limited to, our dealers, contractors and vendors.

Available Information

We file annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to reports filed or furnished pursuant to Sections 13(a) and 15(d) of the Exchange Act. The Securities and Exchange Commission ("SEC") maintains a website at www.sec.gov that contains reports, proxy and information statements and other information we file with the SEC electronically. Copies of our reports on Form 10-K, Form 10-Q, Form 8-K and amendments to those reports may also be obtained, free of charge, electronically on the investor relations page on our website located at investors.sunnova.com as soon as reasonably practical after we file such material with, or furnish it to, the SEC.

We also use the investor relations page on our website as a channel of distribution for important company information. Important information, including press releases, analyst presentations and financial information regarding us, as well as corporate governance information, is routinely posted and accessible on the investor relations page on our website. Information on or that can be accessed through our website is not part of this Annual Report on Form 10-K and the inclusion of our website address is an inactive textual reference only.

Item 1A. Risk Factors.

Investing in our common stock involves a high degree of risk. You should carefully consider the risks described below together with all of the other information included in this Annual Report on Form 10-K, including the section titled "*Management's Discussion and Analysis of Financial Condition and Results of Operations*" and our annual audited consolidated financial statements ("consolidated financial statements") and related notes, before deciding to invest in our common stock. We may experience additional risks and uncertainties not currently known to us; or, as a result of developments occurring in the future, conditions that we currently deem to be immaterial may also materially and adversely affect our business, financial condition, cash flows and results of operations. If any of the risks actually occur, they may materially and adversely affect our business, financial condition, cash flows and results of operations. In this event, the trading price of our common stock could decline and you could lose all or part of your investment in us.

Risks Related to Our Business

Historically, we have incurred operating and net losses and we may be unable to achieve or sustain profitability in the future.

We incurred operating losses of $243.4 million, $81.5 million and $54.9 million and net losses of $502.4 million, $130.3 million and $147.5 million for the years ended December 31, 2023, 2022 and 2021, respectively. These historical operating and net losses were due to a number of factors, including increased expenses to fund our growth and related financing needs. We expect to incur significant expenses as we finance the expansion of our operations and implement additional internal systems and infrastructure to support our growth and operations. We do not know whether our revenue will grow rapidly enough to absorb these costs. Our ability to achieve profitability depends on a number of factors, including:

- growing our customer base and originating new customer agreements on economic terms;
- maintaining or lowering our cost of capital;
- reducing operating costs by optimizing our operations and maintenance processes;
- maximizing the benefits of our dealer network;
- finding additional tax equity investors and other sources of institutional capital; and
- the continued availability of various governmental incentives for the renewable energy industry.

Even if we do achieve profitability, we may be unable to sustain or increase our profitability in the future.

Our growth and operations strategy depends on the continued origination of customer agreements by us and our dealers.

Our growth and operations strategy depends on the continued origination of customer agreements by us and our dealers. We may be unable to originate additional customer agreements and related systems in the numbers or at the pace we currently expect for a variety of reasons, including, among other things, the following:

- demand for solar energy systems or energy storage systems failing to develop sufficiently or taking longer than expected to develop;
- solar energy technology being available at economically attractive prices as a result of factors outside of our control, including utility prices not rising as quickly as anticipated;
- issues related to identifying, engaging, contracting, compensating and maintaining relationships with dealers and the negotiation of dealer agreements;
- issues related to financing, construction, permitting, the environment, governmental approvals and the negotiation of customer agreements;
- a reduction or elimination of government incentives or adverse changes in policy and laws for the development or use of solar energy, including net metering, SRECs and tax credits;
- other government or regulatory actions that could impact our business model;
- negative developments in public perception of the solar energy industry; and
- competition from other solar companies and energy technologies, including the emergence of alternative renewable energy technologies.

If the challenges of originating customer agreements and related systems increase, our pool of available opportunities may be limited, which could have a material adverse effect on our business, financial condition, cash flows and results of operations.

If we fail to manage our operations and growth effectively, we may be unable to execute our business plan, maintain high levels of customer service or adequately address competitive challenges.

We have experienced significant growth in recent periods measured by our number of customers and we intend to continue our efforts to expand our business within existing and new markets. This growth has placed, and any future growth may place, a strain on our management, operational and financial infrastructure. Our growth requires our management to devote a significant amount of time and effort to maintain and expand our relationships with customers, dealers and other third parties, attract new customers and dealers, arrange financing for our growth and manage our expansion into additional markets.

In addition, our current and planned operations, personnel, information technology and other systems and procedures might be inadequate to support our future growth and may require us to make additional unanticipated investments in our infrastructure. Our success and ability to further scale our business will depend, in part, on our ability to manage these changes in a cost-effective and efficient manner.

If we cannot manage our operations and growth, we may be unable to meet our expectations regarding growth, opportunity and financial targets, take advantage of market opportunities, execute our business strategies, meet our tax equity financing commitments or respond to competitive pressures. This could also result in declines in quality or customer satisfaction, increased costs, difficulties in introducing new offerings or other operational difficulties. Any failure to effectively manage our operations and growth could adversely impact our reputation, business, financial condition, cash flows and results of operations.

Our growth and operations are dependent on our dealer network and our failure to retain or replace existing dealers or to grow our dealer network could adversely impact our business.

Our dealer network is an integral component of our business strategy and serves as the means by which we are able to originate customer agreements and related systems in existing and prospective markets. Poor performance by our dealers in originating customer agreements could have a material adverse effect on our business, financial condition and results of operations. We have in the past had disputes and litigation with certain of our dealers over their performance, and, in the future, may have disputes with dealer labor, including with respect to prevailing wage and fringe rate regulations.

Misconduct, noncompliance with applicable laws and regulations, fraud or other improper activities by our or our dealers' employees, affiliates or independent contractors could have a significant negative impact on our and/or their business, investments and results of operations. Such misconduct could include failures to comply with federal employment laws and regulations, consumer protection laws, laws and regulations regarding the pricing of labor provided by dealers and other project costs, and various other applicable laws or regulations applicable to us or our affiliates, including those arising as a result of our participation in the DOE loan guarantee program and current and future DOE loan guarantees to our affiliates. Although we require applicable dealers to comply with such laws and regulations and provide training and processes to help them do so, neither we nor our affiliates control the dealers, nor can we guarantee their compliance with all such laws and regulations. Failure to comply with applicable laws or regulations or acts of fraud or misconduct by dealers or our employees or affiliates could subject us and our affiliates to fines and penalties, and suspension or debarment from future contracting with government agencies. Additionally, changes in laws, regulations or prevailing wages, or a failure to comply with any of the foregoing, could have a significant negative impact on their business reputation, investments and results of operations.

As we grow, particularly in new jurisdictions, we will need to expand our dealer network. We are subject to significant competition for the recruitment and retention of dealers from our competitors and we may not be able to recruit new or replacement dealers in the future. We compete for our dealers with other providers primarily based on the amount and timing of payments for originating customer agreements, financial ability and our suite of technology tools.

Most of our dealers are not restricted in their ability to work with our competitors and are not obligated to continue working with us. In the past, some of our dealers have chosen to work with competitors of ours or terminated their relationships with us and dealers may reduce or terminate their work with us in the future. The departure of a significant number of our dealers for any reason, or the failure to replace departing dealers in the event of such departures, could reduce our potential origination opportunities and could have a material adverse effect on our business, financial condition and results of operations. As we develop and expand our Sunnova Protect services, dealers may view us as a competitor and choose to end their relationship with us.

Additionally, dependence on any one dealer or small group of dealers further concentrates our exposure to risks related to termination of the dealer arrangement, poor service provided by such dealer, the deterioration in financial condition of the dealer and other risks inherent in such a relationship. For the years ended December 31, 2023, 2022 and 2021, Trinity accounted for approximately 10%, 19% and 15% of our net originations, respectively. Although we entered into a sixty-six month exclusivity agreement with Trinity in October 2022, pursuant to which Trinity may only originate solar service agreements for us, there are various exceptions to this obligation. For a discussion of exclusivity arrangements with certain of our dealers, see "*Business—Our Relationships with Our Dealers*".

If we or our dealers fail to hire and retain a sufficient number of employees and service providers in key functions, our growth, profitability and our ability to timely complete customer projects and successfully manage customer accounts would be constrained.

To support our growth and profitability, we and our dealers need to hire, train, deploy, manage and retain a substantial number of skilled employees, engineers, installers, electricians and sales and project finance specialists. Competition for qualified personnel in our industry has increased substantially, particularly for skilled personnel involved in the installation of solar energy systems and energy storage systems. We and our dealers also compete with the homebuilding and construction industries for skilled labor. These industries are cyclical and when participants in these industries seek to hire additional workers, it puts upward pressure on our and our dealers' labor costs. Companies with whom our dealers compete to hire installers may offer compensation or incentive plans that certain installers may view as more favorable. As a result, our dealers may be unable to attract or retain qualified and skilled installation personnel. The further unionization of our industry's labor force or the homebuilding and construction industries' labor forces could also increase our dealers' labor costs. Shortages of skilled labor could significantly delay a project or otherwise increase our dealers' costs. Further, we need to continue to increase the training of our customer service team to provide high-end account management and service to home and business owners before, during and following the point of installation of our solar energy systems and energy storage systems. Identifying and recruiting qualified personnel and training them requires significant time, expense and attention. It can take several months before a new customer service team member is fully trained and productive at the standards we have established. If we are unable to hire, develop and retain talented customer service or other personnel, we may not be able to grow our business.

We do not directly control certain costs related to our business, which could put us at a disadvantage relative to companies who have a vertically integrated business model.

We do not have direct control over the costs our suppliers charge for the components of our solar energy systems and energy storage systems or the costs to our dealers of installing and marketing such products. This may lead us to charge higher prices for our solar energy systems and energy storage systems than our competitors with a vertically integrated business model, causing us to be unable to maintain or increase market share.

We may be unsuccessful in introducing new service and product offerings, including our distributed energy storage services and energy storage management systems.

We intend to introduce new offerings of services and products to both new and existing customers in the future, including home automation products and additional home technology solutions. We may be unsuccessful in significantly broadening our customer base through the addition of these services and products within our current markets or in new markets we may enter. Additionally, we may not be successful in generating substantial revenue from any additional services and products we may introduce in the future and may decline to initiate new product and service offerings.

Our business is concentrated in certain markets, putting us at risk of region-specific disruptions.

As of December 31, 2023, approximately 28%, 16% and 10% of our customers were located in California, Puerto Rico and New Jersey, respectively. In addition, we expect much of our near-term future growth and profitability to occur in these same markets, further concentrating our customer base and operational infrastructure. Accordingly, our business and results of operations are particularly susceptible to adverse economic, regulatory, political, weather and other conditions in such markets and in other markets that may become similarly concentrated. See "*—Certain of our solar energy systems are located in, and we conduct business in, Puerto Rico. Weakness in the fiscal health of the government and PREPA, the damage caused by hurricanes, a series of earthquakes that affected the island in December 2019 and early 2020 and potential tax increases that may increase our cost of conducting business in Puerto Rico, create uncertainty that may adversely impact us. In addition, we are subject to administrative proceedings instituted by the PREB*" and "*General Risk Factors—We are not able to insure against all potential risks and we may become subject to higher insurance premiums*". Any of these conditions, even if only in one such market, could have a material adverse effect on our business, financial condition and results of operations. In addition, all of our current solar energy systems are located in the U.S. and its territories, which makes us particularly susceptible to adverse changes in U.S. tax laws.

Our corporate and operational headquarters is located in Houston, Texas, an area that has a heightened risk of hurricanes and other natural disasters. We may not have adequate insurance, including business interruption insurance, to compensate us for losses that may occur from any such significant events. A significant natural disaster, such as a hurricane, a public health crisis, such as a pandemic, or civil unrest could have a material adverse impact on our business, results of operations and financial condition. In addition, acts of terrorism or malicious computer viruses could cause disruptions in our or our dealers' businesses or the economy as a whole. To the extent these disruptions result in delays or cancellations of installations or the deployment of our solar service offerings, our business, results of operations and financial condition would be adversely affected.

Certain of our solar energy systems are located in, and we conduct business in, Puerto Rico. Weakness in the fiscal health of the government and PREPA, the damage caused by hurricanes, a series of earthquakes that affected the island in December 2019 and early 2020 and potential tax increases that may increase our cost of conducting business in Puerto Rico, create uncertainty that may adversely impact us. In addition, we are subject to administrative proceedings instituted by the PREB.

Puerto Rico is a significant market for our business, representing 16% of our customers as of December 31, 2023 and 2022, respectively, and has suffered from significant economic difficulties in recent years. As a result of the continued weakness of the Puerto Rico economy, liquidity constraints and a lack of market access, the credit ratings of the Puerto Rico government's general obligation bonds and guaranteed bonds, as well as the ratings of most of the Puerto Rico public corporations, including PREPA, are non-investment grade by Moody's, S&P and Fitch Ratings.

Puerto Rico has also enacted certain measures that could increase the cost of solar energy systems. In 2015, the Puerto Rico government increased the sales and use tax from 7% to 11.5%. Although leases and materials used in solar energy systems are currently exempt from such sales and use tax pursuant to Act No. 83-2010, the Green Energy Incentives Act, the increase in sales tax is applicable to repair and maintenance services. Additionally, Sunnova qualifies for a 4% corporate income tax rate under the Green Energy Incentives Act. Should our current tax incentives expire or additional taxes be imposed, the tax increase may impose greater costs on our future and current customers, which may hinder our future origination efforts and adversely impact our business, financial condition, results of operations and future growth and profitability. Future changes in Puerto Rico tax law could affect our tax position and adversely impact our business.

Although Puerto Rico had already suffered from economic difficulties in recent years, Hurricane Fiona in 2022 and Hurricanes Irma and Maria in 2017, catastrophic weather events whose effects have been long enduring, earthquakes in the southwest of the island beginning in 2019 and continuing through 2020 and the COVID-19 pandemic have caused significant additional disruption to the island's electric grid and economic activity. The continued weakness of the Puerto Rico economy has strained the fiscal health of the government, which may create uncertainty that may adversely impact us. Furthermore, the future financial condition and prospects of PREPA are uncertain, which could negatively impact the availability and the reliability of Puerto Rico's electrical grid and adversely impact our operations on the island.

In 2018, the government of Puerto Rico enacted legislation that set in motion the privatization of PREPA. Said legislation governs the establishment of public-private partnerships ("P3") with respect to the concession for the distribution and transmission assets, services and facilities of PREPA, including its generation assets. In the summer of 2020, the government of Puerto Rico signed a 15-year P3 agreement with LUMA Energy, LLC to operate, maintain and modernize PREPA's electric transmission and distribution system. Moreover, in November 2020, the government announced that several companies had been qualified as part of the procurement process related to the Request for Qualifications for the management and operation of PREPA's legacy generation assets. In January 2023, the management and operation of PREPA's legacy generation assets was awarded to Genera PR, LLC, a wholly owned subsidiary of New Fortress Energy Inc.

Legislation enacted in April 2019 requires a study of net metering to be completed within five years, which may result in revisions to the existing rules. However, no changes can be made to retail net metering for five years after the date the legislation was enacted. Meanwhile, "true" net metering will continue to apply, meaning the credit for energy exported by net metering clients will equal the value of such energy under the rate applicable to those clients and accordingly, their charges will be based on their net consumption. Customers subject to this regime will continue to be covered by it on a legacy basis for a period of 20 years from the date of their net metering agreements.

Net metering customers in Puerto Rico may be impacted by transition charges and other requirements contemplated in a restructuring agreement between PREPA and its creditors, currently pending before the U.S. District Court for the District of Puerto Rico in bankruptcy-like proceedings under Title III of the Puerto Rico Oversight, Management, and Economic Stability Act ("PROMESA"). PROMESA provides PREPA with access to a workout process similar to bankruptcy. The Financial Oversight and Management Board for Puerto Rico has filed a fourth amended Plan of Adjustment ("POA") to reduce more than $10 billion of total asserted claims by various creditors against PREPA before the U.S. District Court for the District of Puerto Rico in bankruptcy-like proceedings under Title III of the PROMESA. Said POA includes a "legacy charge" that is composed of a volumetric charge depending on consumption and a flat connection fee; a direct "solar tax" is not currently expected.

Depending on a customer's consumption and status as a rate payer (i.e. low income exemption), rates are likely to increase. Nevertheless, the POA has not been finally adjudicated by the Title III Court, and creditors could appeal any final judgement. Hence, the PREPA bankruptcy is ongoing but is nearing its final stages.

While we do not currently contract directly with the Puerto Rico government or PREPA, continued weakness in the Puerto Rico economy or the failure of the Puerto Rico government to manage its fiscal challenges in an orderly manner could result in policy decisions we do not anticipate and may directly or indirectly adversely impact our business, financial condition and results of operations. In addition, it is unclear whether the selection of private concessionaires for PREPA's transmission and distribution system and legacy generation assets may have an impact on our business.

The PREB has instituted administrative proceedings regarding customer complaints about our Puerto Rican operations, the operations of some of our dealers in Puerto Rico and certain Sunnova policies and procedures related to contract disclosures and invoice disputes in Puerto Rico. At this time, we are unable to determine whether the PREB will seek penalties against us in the future in connection with these proceedings or require a change in our practices and procedures. Based on this matter, the U.S. Better Business Bureau listed Sunnova as not accredited. We have not experienced a material impact as a result of the listing.

The ongoing COVID-19 pandemic and future pandemics could adversely affect our business, financial condition and results of operations.

We cannot predict the full impact the COVID-19 pandemic or other pandemics or the affect any resulting disruption and volatility in the capital markets will have on our business, cash flows, liquidity, financial condition and results of operations due to numerous uncertainties. The ultimate impact will depend on future developments, including, among other things, the ultimate duration of any such virus, the distribution, acceptance and efficacy of a vaccine, the depth and duration of the economic downturn and other economic effects of the pandemic, the consequences of governmental and other measures designed to prevent the spread of any such virus, actions taken by governmental authorities, customers, dealers and other third parties, our ability and the ability of our customers, potential customers and dealers to adapt to operating in a changed environment and the timing and extent to which normal economic and operating conditions resume thereafter.

Dealer and marketplace confidence in our liquidity and long-term business prospects is important for building and maintaining our business.

Our financial condition, operating results and business prospects may suffer materially if we are unable to establish and maintain confidence about our liquidity and business prospects among dealers, consumers and within our industry. Our dealer network is an integral component of our business strategy and serves as the means by which we are able to rapidly and successfully expand within existing and prospective markets. Dealers and other third parties will be less likely to enter into dealer agreements with us or originate new customer agreements if they are uncertain we will be able to make payments on time, our business will succeed or our operations will continue for many years.

Our solar energy systems and energy storage systems require ongoing maintenance and support. If we were to reduce operations, even years from now, buyers of our solar energy systems and energy storage systems from years earlier might have difficulty having us provide or arrange repairs or other services to our and their solar energy systems and energy storage systems, which remain our responsibility under the terms of our solar service agreements. As a result, consumers may be less likely to enter into solar service agreements with us if they are uncertain our business will succeed or our operations will continue for many years.

Accordingly, in order to build and maintain our business, we must maintain confidence among dealers, customers and other parties in our liquidity and long-term business prospects. We may not succeed in our efforts to build this confidence.

Damage to our brand and reputation or change or loss of use of our brand could harm our business and results of operations.

We depend significantly on our reputation for high-quality products, excellent customer service and the brand name "Sunnova" to attract new customers and grow our business. If we fail to continue to deliver our solar energy systems, energy storage systems or other sustainable home products within the planned timelines, if our offerings do not perform as anticipated or if we damage any of our customers' properties or delay or cancel projects, our brand and reputation could be significantly impaired. Future technological improvements may allow us to offer lower prices or offer new technology to new customers; however, technical limitations in our current solar energy systems and energy storage systems may prevent us from offering such lower prices or new technology to our existing customers. The inability of our current customers to benefit from technological improvements could cause our existing customers to lower the value they perceive our existing products offer and impair our brand and reputation.

In addition, given the sheer number of interactions our personnel or dealers operating on our behalf have with customers and potential customers, it is inevitable that some customers' and potential customers' interactions with our company or dealers operating on our behalf will be perceived as less than satisfactory. This has led to instances of customer complaints, some of which have affected our digital footprint on rating websites and social media platforms. If we cannot manage our hiring and training processes to avoid or minimize these issues to the extent possible, our reputation may be harmed and our ability to attract new customers would suffer.

In addition, if we were to no longer use, lose the right to continue to use or if others use the "Sunnova" brand, we could lose recognition in the marketplace among customers, suppliers and dealers, which could affect our business, financial condition, results of operations and would require financial and other investment and management attention in new branding, which may not be as successful. Further, an increased politicization of solar energy and financing options may result in increased scrutiny on our industry participants and may negatively impact consumers' perception of our products.

Our operating results and our ability to grow may fluctuate from quarter to quarter and year to year, which could make our future performance difficult to predict and could cause our operating results for a particular period to fall below expectations.

Our quarterly and annual operating results and our ability to grow are difficult to predict and may fluctuate significantly in the future. We have experienced seasonal and quarterly fluctuations in the past and expect to experience such fluctuations in the future. In addition to the other risks described in this "*Risk Factors*" section, the following factors could cause our operating results to fluctuate:

- expiration, reduction, or initiation of any governmental rebates or incentives;
- significant fluctuations in customer demand for our solar energy services and related systems;
- our dealers' ability to complete installations in a timely manner;
- our and our dealers' ability to gain interconnection permission for an installed solar energy system from the relevant utility;
- the availability, terms and costs of suitable financing;
- the amount, timing of sales and potential decreases in value of investment tax credits ("ITCs") and SRECs;
- our ability to continue to expand our operations and the amount and timing of expenditures related to this expansion;
- announcements by us or our competitors of significant acquisitions, strategic partnerships, joint ventures or capital-raising activities or commitments;
- changes in our pricing policies or terms or those of our competitors, including centralized electric utilities;
- actual or anticipated developments in our competitors' businesses, technology or the competitive landscape; and
- natural disasters or other weather or meteorological conditions.

For these or other reasons, the results of any prior quarterly or annual periods should not be relied upon as indications of our future performance.

Inflation could result in decreased value from future contractual payments and higher expenses for labor and equipment, which, in turn, could adversely impact our reputation, business, financial condition, cash flows and results of operations.

Any future increase in inflation may adversely affect our costs, including our dealers' cost of labor and equipment, and may result in a decrease in value in our future contractual payments. Many of our solar service agreements, which generally have a term ranging from 10 to 25 years, do not contain any pricing escalators. The pricing escalators we do have may not keep pace with inflation, which would result in the agreement yielding decreased value over time. These factors could adversely impact our reputation, business, financial condition, cash flows and results of operations.

Increased interest rates may result in a decrease in origination for our homebuilder channel and a reduction in principal prepayments by our customers.

Origination for our homebuilder channel relies on the construction and sale of new homes by our homebuilder partners. Many customers of our homebuilder partners rely on mortgage loans from banks and other lenders to finance a substantial portion of the purchase price for their home. Increased mortgage interest rates may lead to lower demand for new homes and a reduced number of homes available for solar origination through our homebuilder channel. Additionally, increased interest rates may result in fewer secondary home sales, a reduction in the number of customers refinancing their mortgage and uncertainty about the economy. This could result in a material reduction in the amount of our customers making principal prepayments of their loans.

Future expansions of our operations may subject us to additional risks.

We may expand into other industry verticals in the future. There is no assurance that we will be able to successfully develop products and services that are valued for these new industries. Our investment of resources to develop products and services for the new industries we enter into may either be insufficient or result in expenses that are excessive as compared to the revenue that we may earn in launching such vertical.

As we explore additional opportunities, we can make no assurance that we will be able to accurately forecast demand (or lack thereof) for our products or services or that new industries would be receptive to our products or services. Failure to predict demand or growth accurately in new industries could have a material adverse effect on our business.

Any future international operations may subject us to risks related to currency fluctuations. Foreign currencies periodically experience rapid and/or large fluctuations in value against the U.S. dollar. A weakened U.S. dollar could increase the cost of procurement of raw materials, by our suppliers, from foreign jurisdictions and operating expenses in foreign locations, which could have a material adverse effect on our business and results of operations.

Since the price at which we originate product offerings from our dealers is generated in U.S. dollars, we are mostly insulated from currency fluctuations. However, since suppliers of our dealers often incur a significant amount of their costs by purchasing raw materials and generating operating expenses in foreign currencies, if the value of the U.S. dollar depreciates significantly or for a prolonged period of time against these other currencies, this may cause those suppliers to raise the prices they charge us and our dealers, which in turn could harm our business and results of operations. Although the value of the U.S. dollar has been high relative to other currencies in recent periods, there is no guarantee this trend will continue.

If we are unsuccessful in developing and maintaining our proprietary technology, including our Catalyst software, our ability to attract and retain dealers and customers could be impaired, our competitive position and our ability to raise capital could be harmed and our results of operations and financial position could be harmed.

Our future growth and profitability depends on our ability to continue to develop and maintain our proprietary technology that supports our solar service offerings, including our design and proposal software, Catalyst. In addition, we rely, and expect to continue to rely, on licensing agreements with certain third parties for aerial images that allow us to efficiently and effectively analyze a customer's rooftop for solar energy system specifications. In the event our current or future products require features that we have not developed or licensed, or we lose the benefit of an existing license, we will be required to develop or obtain such technology through purchase, license or other arrangements. If the required technology is not available on commercially reasonable terms, or at all, we may incur additional expenses in an effort to internally develop the required technology.

If our allowance for credit losses is not enough to cover actual credit losses from our customer notes receivable portfolio, our results of operations and financial condition could be negatively affected.

We maintain an allowance for credit losses, which is a reserve that represents our best estimate of actual credit losses we may experience in our existing customer notes receivable portfolio. The level of the allowance reflects our continuing evaluation of factors including the financial asset type, customer credit rating, contractual term, vintage, volume and trends in delinquencies, nonaccruals, write-offs and present economic, political and regulatory conditions. The determination of the appropriate level of the allowance for credit losses inherently involves subjectivity in our modeling and requires us to make estimates of current credit risks and future trends, all of which may undergo material changes or vary from our historical experience. Deterioration in economic conditions affecting our customers, including the effects of rising inflation in the U.S., new information regarding existing loans and other factors, both within and outside of our control, may require an increase in the allowance for credit losses. Furthermore, if write-offs in future periods exceed the allowance for credit losses we will need to increase the allowance for credit losses in future periods. Any increases in the allowance for credit losses will result in an increase in net loss and could have a material adverse effect on our business, financial condition and results of operations.

We adopted Accounting Standards Update No. 2016-13, *Financial Instruments—Credit Losses*, in January 2020, which requires entities to use a forward-looking expected loss approach, referred to as the current expected credit loss ("CECL") methodology in place of the previously-used incurred loss model. In future periods, CECL may result in increased reserves during or in advance of an economic downturn. If we are required to materially increase our level of allowance for credit losses for any reason, such increase could have a material adverse effect on our business, financial condition and results of operations.

Certain of our key operational metrics, including estimated gross contracted customer value, are based on various assumptions and estimates we make that cover an extended period of time. Actual experience may vary materially from these estimates and assumptions and therefore undue reliance should not be placed on these metrics.

Our key operational metrics include a number of assumptions and estimates we make that cover an extended period of time (up to 35 years) and may not prove accurate. In calculating estimated gross contracted customer value, we estimate projected monthly customer payments over the remaining life of our customer agreements, in particular our solar service agreements which typically range from 10 to 25 years in length with an opportunity for customers to renew for up to an additional 10 years, and from the future sale of related SRECs. These estimated future cash flows depend on various factors including but not limited to customer agreement type, contracted rates, customer loss rates, expected sun hours and the projected production capacity of the solar equipment installed. Additionally, in calculating estimated gross contracted customer value we also estimate cash distributions to tax equity fund investors and operating, maintenance and administrative expenses associated with the customer agreements, including expenses related to accounting, reporting, audit, insurance, maintenance and repairs over the remaining life of our customer agreements.

Furthermore, in calculating estimated gross contracted customer value, we discount our future net cash flows at 6% based in part on industry practice and in part on the interest rate obtained on certain recent securitizations. This discount rate might not be the most appropriate discount rate based on interest rates in effect from time to time and industry or company-specific risks associated with these cash flows and the appropriate discount rate for these estimates may change in the future due to the level of inflation, rising interest rates, our cost of capital, customer default rates and consumer demand for solar energy systems, among other things. We also assume customer losses of 0% in calculating these metrics even though we expect to have some minimal level of customer losses over the life of our contracts. To illustrate the way in which actual results may change, we present sensitivities around the discount rate and the rate of customer losses, although these sensitivities may not capture the most appropriate discount rate or the rate of customer losses we will experience. For a discussion of estimated gross contracted customer value and the related discount rate and such sensitivities, see "*Management's Discussion and Analysis of Financial Condition and Results of Operations—Key Financial and Operational Metrics—Estimated Gross Contracted Customer Value*".

PricewaterhouseCoopers LLP has not audited, reviewed, examined, compiled nor applied agreed-upon procedures with respect to these operational metrics or their components. The estimates discussed above are based on a combination of assumptions that may prove to be inaccurate over time. Such inaccuracies could be material, particularly given the estimates relate to cash flows up to 35 years in the future.

Risks Related to the Solar Industry

If sufficient additional demand for solar energy systems does not develop or takes longer to develop than we anticipate, our origination of solar service agreements may decrease.

The distributed solar energy market is at a relatively early stage of development in comparison to fossil fuel-based electricity generation. If additional demand for distributed solar energy systems fails to develop sufficiently or takes longer to develop than we anticipate, we may be unable to originate additional solar service agreements and related solar energy systems and energy storage systems to grow our business. In addition, demand for solar energy systems and energy storage systems in our targeted markets may not develop to the extent we anticipate. As a result, we may be unsuccessful in broadening our customer base through origination of solar service agreements and related solar energy systems and energy storage systems within our current markets or in new markets we may enter.

Many factors may affect the demand for solar energy systems, including the following:

- availability, substance and magnitude of solar support programs including government targets, subsidies, incentives, renewable portfolio standards and net metering rules;
- the relative pricing of other conventional and non-renewable energy sources, such as natural gas, coal, oil and other fossil fuels, wind, utility-scale solar, nuclear, geothermal and biomass;
- performance, reliability and availability of energy generated by solar energy systems compared to conventional and other non-solar renewable energy sources;
- availability and performance of energy storage technology, the ability to implement such technology for use in conjunction with solar energy systems and the cost competitiveness such technology provides to customers as compared to costs for those customers reliant on the conventional electrical grid; and
- general economic conditions and the levels of inflation and interest rates.

The solar energy industry is constantly evolving, which makes it difficult to evaluate our prospects. We cannot be certain if historical growth rates reflect future opportunities or whether growth anticipated by us will be realized. The failure of distributed solar energy to achieve, or its being significantly delayed in achieving, widespread adoption could have a material adverse effect on our business, financial condition and results of operations.

A material reduction in the retail price of electricity charged by electric utilities or other retail electricity providers would harm our business, financial condition and results of operations.

Decreases in the retail price of electricity from electric utilities or from other retail electric providers, including other renewable energy sources such as larger-scale solar energy systems, could make our offerings less economically attractive. The price of electricity from utilities could decrease as a result of:

- the construction of a significant number of new power generation plants, whether generated by natural gas, nuclear power, coal or renewable energy;
- the construction of additional electric transmission and distribution lines;
- a reduction in the price of natural gas or other natural resources as a result of increased supply due to new drilling techniques or other technological developments, a relaxation of associated regulatory standards or broader economic or policy developments;
- less demand for electricity due to energy conservation technologies and public initiatives to reduce electricity consumption or to recessionary economic conditions; and
- development of competing energy technologies that provide less expensive energy.

A reduction in electric utilities' rates or changes to peak hour pricing policies or rate design (such as the adoption of a fixed or flat rate) could also make our offerings less competitive with the price of electricity from the electrical grid. If the cost of energy available from electric utilities or other providers were to decrease relative to solar energy generated from solar energy systems or if similar events impacting the economics of our offerings were to occur, we may have difficulty attracting new customers or existing customers may default or seek to terminate, cancel or otherwise avoid the obligations under their solar service agreements. For example, large utilities in California have started transitioning customers to time-of-use rates and also have adopted a shift in the peak period for time-of-use rates to later in the day. Unless grandfathered under a different rate, customers with solar energy systems are required to take service under time-of-use rates with the later peak period. Moving utility customers to time-of-use rates or the shift in the timing of peak rates for utility-generated electricity to include times of day when solar energy generation is less efficient or non-operable could also make our offerings less competitive. Time-of-use rates could also result in higher costs for our customers whose electricity requirements are not fully met by our offerings during peak periods.

Additionally, the price of electricity from utilities may grow less quickly than the escalator feature in certain of our solar service agreements, which could also make our solar energy systems less competitive with the price of electricity from the electrical grid and result in a material adverse effect on our business, financial condition and results of operations.

Our business has benefited from the declining cost of solar energy system and energy storage system components and may be harmed to the extent the cost of such components stabilizes or increases in the future.

Our business has benefited from the declining cost of solar energy system and energy storage system components and to the extent such costs stabilize, decline at a slower rate or increase, our future growth rate may be negatively impacted. The declining cost of solar energy system and energy storage system components and the raw materials necessary to manufacture them has been a key driver in the price of solar energy systems and energy storage systems we own, the prices charged for electricity and customer adoption of solar energy. While historically solar energy system and energy storage system components and raw material prices have declined, the cost of these components and raw materials have recently increased and may continue to increase in the future, and such products' availability could decrease, due to a variety of factors, including growth in the solar energy system and energy storage system industries and the resulting increase in demand for solar energy system and energy storage system components and the raw materials necessary to manufacture them, supply chain disruptions, tariff penalties, duties, and trade barriers, export regulations, regulatory or contractual limitations, industry market requirements and industry standards, changes in technology, the loss of or changes in economic governmental incentives, inflation or other factors. An increase of solar energy system components and raw materials prices could slow our growth and operations and cause our business and results of operations to suffer. See "*—Increases in the cost or reduction in supply of solar energy system and energy storage system components due to tariffs or trade restrictions imposed by the U.S. government could have an adverse effect on our business, financial condition and results of operations*".

We and our dealers depend on a limited number of suppliers of solar energy system components and technologies to adequately meet demand for our solar energy systems. Due to the limited number of suppliers in our industry, the acquisition of any of these suppliers by a competitor or any shortage, delay, price change, imposition of tariffs or duties or other limitation in our or our dealers' ability to obtain components or technologies we use could result in sales and installation delays, cancelations and loss of customers.

We rely on our dealers to install solar energy systems and energy storage systems, each of whom has direct supplier arrangements. Our dealers purchase solar panels, inverters, energy storage systems and other system components and instruments from a limited number of suppliers, approved by us, making us susceptible to quality issues, shortages and price changes. For the year ended December 31, 2023, Hanwha Q-Cells and Canadian Solar supplied approximately 55% and 11% of our solar photovoltaic panels installed, respectively, and no other supplier represented more than 10% of our solar photovoltaic panels installed. For the year ended December 31, 2022, Hanwha Q-Cells supplied approximately 68% of our solar photovoltaic panels installed and no other supplier represented more than 10% of our solar photovoltaic panels installed. For the year ended December 31, 2023, Enphase Energy, Inc. and SolarEdge Technologies Inc. accounted for approximately 67% and 27%, respectively, of the inverters used in our solar energy system installations. For the year ended December 31, 2022, Enphase Energy, Inc. and SolarEdge Technologies Inc. accounted for approximately 57% and 42%, respectively, of the inverters used in our solar energy system installations. For the year ended December 31, 2023, Tesla, Inc. accounted for approximately 87% of our energy storage system purchases. For the year ended December 31, 2022, Tesla, Inc. accounted for approximately 94% of our energy storage system purchases. There are a limited number of suppliers of solar energy system components, instruments and technologies. If one or more of the suppliers we and our dealers rely upon to meet anticipated demand ceases or reduces production due to its financial condition, acquisition by a competitor or otherwise, is unable to increase production as industry demand increases or is otherwise unable to allocate sufficient production to us and our dealers, it may be difficult to quickly identify alternative suppliers or to qualify alternative products on commercially reasonable terms and our ability and the ability of our dealers to satisfy this demand may be adversely affected. While we believe there are other sources of supply for these products available, a dealer's need to transition to a new supplier may result in additional costs and delays in originating solar service agreements and deploying our related solar energy systems or energy storage systems, which in turn may result in additional costs and delays in our acquisition of such solar service agreements and related solar energy systems and energy storage systems. These issues could have a material adverse effect on our business, financial condition and results of operations.

There have also been periods of industry-wide shortages of key components and instruments, including batteries and inverters, in times of rapid industry growth. The manufacturing infrastructure for some of these components has a long lead-time, requires significant capital investment and relies on the continued availability of key commodity materials, potentially resulting in an inability to meet demand for these components. The solar industry is currently experiencing rapid growth and, as a result, shortages of key components or instruments, including solar panels, may be more likely to occur, which in turn may result in price increases for such components. Even if industry-wide shortages do not occur, suppliers may decide to allocate key components or instruments with high demand or insufficient production capacity to more profitable customers, customers with long-term supply agreements or customers other than us, our dealers or other third parties from whom we may originate solar energy systems and our ability to originate solar service agreements and related solar energy systems and energy storage systems may be reduced as a result.

Our supply chain and operations (or those of our dealers) could be subject to natural disasters and other events beyond our control, such as earthquakes, wildfires, flooding, hurricanes, freezes, tsunamis, typhoons, volcanic eruptions, droughts, tornadoes, power outages or other natural disasters, the effects of climate change and related extreme weather, public health issues and pandemics, war, terrorism, government restrictions or limitations on trade, impediments to international shipping and geopolitical unrest and uncertainties. Human rights and forced labor issues in foreign countries and the U.S. government's response to them could disrupt our supply chain and our operations could be adversely impacted.

Historically, we and our dealers have relied on foreign suppliers for a number of solar energy system components, instruments and technologies that our dealers purchase. Our success in the future may be dependent on our dealers' ability to import or transport such products from overseas vendors in a timely and cost-effective manner. We and our dealers may rely heavily on third parties, including ocean carriers and truckers, both of which are experiencing disruptions, shortages and rate increases, in that process. Our dealers may find it necessary to rely on an increasingly expensive spot market and other alternative sources to make up any shortfall in shipping needs.

If our dealers cannot obtain substitute materials or components on a timely basis or on acceptable terms, they could be prevented from installing our solar energy systems within the time frames required in our customer contracts. Any such delays could increase our overall costs, reduce our profit, delay the timing for solar energy systems to be placed in service and ultimately have a material adverse effect on our business, financial condition and results of operations.

Warranties provided by the manufacturers of equipment for our assets and maintenance obligations of our dealers may be limited by the ability of a supplier and/or dealer to satisfy its warranty or performance obligations or by the expiration of applicable time or liability limits, which could reduce or void the warranty protections or may be limited in scope or magnitude of liabilities and thus, the warranties and maintenance obligations may be inadequate to protect us.

We agree to maintain the solar energy systems and energy storage systems installed on our customers' homes and businesses during the length of the term of our solar service agreements, which typically range from 10 to 25 years. We are exposed to any liabilities arising from the solar energy systems' failure to operate properly and are generally under an obligation to ensure each solar energy system remains in good condition during the term of the agreement. We are the beneficiary of the panel manufacturers' warranty coverage, typically of 10 years for material and 25 years for performance and workmanship, the inverter manufacturers' warranty coverage, typically from 10 to 25 years and the energy storage manufacturers' warranty coverage, typically of 10 years. Furthermore, our dealers provide warranties as to their workmanship. In the event such warranty providers or dealers file for bankruptcy, cease operations, face regulatory challenges that limit or prevent conducting operations or otherwise become unable or unwilling to fulfill their warranty or maintenance obligations, we may not be adequately protected by such warranties or maintenance obligations. Even if such warranty or maintenance providers or dealers fulfill their obligations, the warranty or maintenance obligations may not be sufficient to protect us against all of our losses. In addition, our warranties are of limited duration, ranging from one year, in the case of certain solar energy system and transformer warranties, to 25 years, in the case of certain panel performance and workmanship warranties, after the date each equipment item is delivered or commissioned, although the useful life of our solar energy systems is 35 years. These warranties are subject to liability and other limits. If we seek warranty protection and a warranty provider is unable or unwilling to perform its warranty obligations, or if a dealer is unable or unwilling to perform its maintenance obligations, whether as a result of its financial condition, its inability to comply with applicable laws or regulations, or otherwise, or if the term of the warranty or maintenance obligation has expired or a liability limit has been reached, there may be a reduction or loss of protection for the affected assets, which could have a material adverse effect on our business, financial condition and results of operations.

Our failure to accurately predict future liabilities related to material quality or performance expenses could result in unexpected volatility in our financial condition. Because of the long estimated useful life of our solar energy systems, we have been required to make assumptions and apply judgments regarding a number of factors, including our anticipated rate of warranty claims and the durability, performance and reliability of our solar energy systems. We made these assumptions based on the historic performance of similar solar energy systems or on accelerated life cycle testing. Our assumptions could prove to be materially different from the actual performance of our solar energy systems, causing us to incur substantial expense to repair or replace defective solar energy systems in the future or to compensate customers for solar energy systems that do not meet their performance guarantees. Equipment defects, serial defects or operational deficiencies also would reduce our revenue from solar service agreements because the customer payments under such agreements are dependent on solar energy system production or would require us to make refunds under performance guarantees. Any widespread product failures or operating deficiencies may damage our market reputation and adversely impact our financial results. For further discussion of these potential charges and related proposals, see "*Management's Discussion and Analysis of Financial Condition and Results of Operations—Components of Results of Operations*".

Increases in the cost or reduction in supply of solar energy system and energy storage system components due to tariffs or trade restrictions imposed by the U.S. government could have an adverse effect on our business, financial condition and results of operations.

China is a major producer of solar cells and other solar products. Certain solar cells, modules, laminates and panels from China are subject to various U.S. anti-dumping and countervailing duty rates, depending on the exporter supplying the product, imposed by the U.S. government as a result of determinations that the U.S. was materially injured as a result of such imports being sold at less than fair value and subsidized by the Chinese government. While historically our dealers have endeavored to purchase these products from manufacturers outside of China, some of these products are purchased from manufacturers in China or from manufacturers in other jurisdictions who rely, in part, on products sourced in China. If alternative sources are no longer available on competitive terms in the future, we and our dealers may be required to purchase these products from manufacturers in China. In addition, tariffs on solar cells, modules and inverters in China may put upward pressure on prices of these products in other jurisdictions from which our dealers currently purchase equipment, which could reduce our ability to offer competitive pricing to potential customers.

The anti-dumping and countervailing duties discussed above are subject to annual review and may be increased or decreased. Furthermore, under Section 301 of the Trade Act of 1974, the USTR imposed tariffs on $200 billion worth of imports from China, including inverters and certain AC modules and non-lithium-ion batteries, effective September 24, 2018. In May 2019, the tariffs were increased from 10% to 25% and may be raised by the USTR in the future. Since these tariffs impact the purchase price of the solar products, these tariffs raise the cost associated with purchasing these solar products from China and reduce the competitive pressure on providers of solar cells not subject to these tariffs.

In August 2021, an anonymous trade group filed a petition with the U.S. Department of Commerce requesting an investigation into whether solar panels and cells imported from Malaysia, Thailand and Vietnam are circumventing anti-dumping and countervailing duties imposed on solar products manufactured in China. The group also requested the imposition of tariffs on such imports ranging from 50% - 250%. In November 2021, the U.S. Department of Commerce rejected the petition, citing the petitioners' ongoing anonymity as one of the reasons for its decision. In March 2022, the U.S. Department of Commerce announced it is initiating country-wide circumvention inquiries to determine whether imports of solar cell and modules produced in Cambodia, Malaysia, Thailand and Vietnam that use components from China are circumventing anti-dumping and countervailing duty orders on solar cells and modules from China. The Department of Commerce's inquiries were initiated pursuant to a petition filed by Auxin Solar, Inc. on February 8, 2022.

In December 2022, the Department of Commerce announced its preliminary determination in the investigation. In its determination, the Department of Commerce found that certain Chinese solar manufacturers circumvented U.S. import duties by routing some of their operations through Cambodia, Malaysia, Thailand and Vietnam. Given the Department of Commerce preliminarily found that circumvention was occurring through each of the four Southeast Asian countries, the Department of Commerce made a "country-wide" circumvention finding, which designates each country as one through which solar cells and modules are being circumvented from China. However, companies in these countries will be permitted to certify they are not circumventing the U.S. import duties, in which case the circumvention findings may not apply. In August 2023, after completing its investigation, which included conducting in-person audits and gathering public comments, the Department of Commerce issued a final determination that affirmed its preliminary determination in most respects and found that five of eight manufacturers investigated were circumventing anti-dumping and countervailing duty orders.

Notably, however, on June 6, 2022, the President of the United States issued an emergency declaration establishing a two-year tariff exemption on new tariffs for solar panels and cells imported from Cambodia, Malaysia, Thailand and Vietnam, delaying the possibility of the imposition of new anti-dumping and countervailing duties until the end of such two-year period. In September 2022, the Department of Commerce issued its final rule effectuating the two-year exemption period, and new dumping duties will not be imposed on solar panels and cells imported from Cambodia, Malaysia, Thailand and Vietnam until the earlier of two years after the date of the emergency declaration or when the emergency is terminated. Tariffs may be reinstated following the exemption period, but under the Department of Commerce's rule, imports of solar cells and modules will not be subject to retroactive tariffs during the exemption period. In December 2023, Auxin Solar and Concept Clean Energy commenced a new lawsuit challenging the Department of Commerce's authority to effect the exemption period and seeking to "reliquidate" imports completed during that period in order to retroactively apply anti-dumping and countervailing duty tariffs. The addition of new anti-dumping and countervailing duties would significantly disrupt the supply of solar cells and modules to customers in the U.S., as a large percentage of solar cells and modules used in the U.S. are imported from Cambodia, Malaysia, Thailand and Vietnam. If imposed, these or similar tariffs could put upward pressure on prices of these solar products, which could reduce our ability to offer competitive pricing to potential customers.

In addition, in December 2021, the U.S. International Trade Commission recommended the President extend tariffs initially imposed in 2018 on imported crystalline silicon PV cells and modules for another four years, until 2026. Under Presidential Proclamation 10339, published in February 2022, President Biden extended the tariff beyond the scheduled expiration date of February 6, 2022, with an initial tariff of 14.75%, which will gradually be reduced to 14% by the eighth year of the measure. Since such actions increase the cost of imported solar products, to the extent we or our dealers use imported solar products or domestic producers are able to raise their prices for their solar products, the overall cost of the solar energy systems will increase, which could inhibit our ability to offer competitive pricing in certain markets.

Additionally, the U.S. government has imposed various trade restrictions on Chinese entities determined to be acting contrary to U.S. foreign policy and national security interests. For example, the U.S. Department of Commerce's Bureau of Industry and Security has added a number of Chinese entities to its entity list for enabling human rights abuses in the Xinjiang Uyghur Autonomous Region ("XUAR") or for procuring U.S. technology to advance China's military modernization efforts, thereby imposing severe trade restrictions against these designated entities. Moreover, in June 2021, U.S. Customs and Border Protection issued a Withhold Release Order pursuant to Section 307 of the Tariff Act of 1930 barring the entry into U.S. commerce of silica-based products (such as polysilicon) manufactured by Hoshine Silicon Industry Co. Ltd. ("Hoshine") and related companies, as well as goods made using those products, based on allegations related to Hoshine labor practices in the XUAR to manufacture such products. Additionally, in December 2021, Congress passed the Uyghur Forced Labor Prevention Act, which, with limited exception, prohibits the importation of all goods or articles mined or produced in whole or in part in the XUAR, or goods or articles mined or produced by entities working with the XUAR government to recruit, transport or receive forced labor from the XUAR. Although we maintain policies and procedures designed to maintain compliance with all governmental laws and regulations, these and other similar trade restrictions that may be imposed against Chinese entities in the future may have the effect of restricting the global supply of, and raising prices for, polysilicon and solar products, which could increase the overall cost of solar energy systems and reduce our ability to offer competitive pricing in certain markets.

We cannot predict what additional actions the U.S. may adopt with respect to tariffs or other trade regulations or what actions may be taken by other countries in retaliation for such measures. The tariffs described above, the adoption and expansion of trade restrictions, the occurrence of a trade war or other governmental action related to tariffs, trade agreements or related policies have the potential to adversely impact our supply chain and access to equipment, our costs and ability to economically serve certain markets. If additional measures are imposed or other negotiated outcomes occur, our ability or the ability of our dealers to purchase these products on competitive terms or to access specialized technologies from other countries could be further limited, which could adversely affect our business, financial condition and results of operations.

The solar energy systems we own or may originate have a limited operating history and may not perform as we expect.

Many of the solar energy systems we currently own or may originate in the future have not commenced operations, have recently commenced operations or otherwise have a limited operating history. Of the approximately 200,000 solar energy systems we owned as of December 31, 2023, 27%, 16% and 13% were placed into service in 2023, 2022 and 2021, respectively. The ability of our solar energy systems to perform as we expect will also be subject to risks inherent in newly constructed renewable energy assets, including breakdowns and outages, latent defects, equipment that performs below our expectations, system failures and outages. As a result, our assumptions and estimates regarding the performance of these solar energy systems are, and will be, made without the benefit of a meaningful operating history, which may impair our ability to accurately assess the potential profitability of the solar energy systems and, in turn, our results of operations, financial condition and cash flows.

The cost of maintenance or repair of solar energy systems or energy storage systems throughout the term of the associated solar service agreement or the removal of solar energy systems at the end of the term of the associated solar service agreement may be higher than projected today and adversely affect our financial performance and valuation.

If we incur repair and maintenance costs on our solar energy systems or energy storage systems after the individual component warranties have expired and if they then fail or malfunction, we will be liable for the expense of repairing these solar energy systems or energy storage systems without a chance of recovery from our suppliers. In addition, we typically bear the cost of removing the solar energy systems at the end of the term of the lease or PPA if the customer does not renew his or her agreement or elect to purchase the solar energy system at the end of its term. Furthermore, it is difficult to predict how future environmental regulations may affect the costs associated with the repair, removal, disposal or recycling of our solar energy systems. This could materially impair our future operating results.

Problems with performance of our solar energy systems may cause us to incur expenses, may lower the value of our solar energy systems and may damage our market reputation and adversely affect our business.

In most cases, our long-term leases and loan agreements contain a performance guarantee in favor of the customer. Solar service agreements with performance guarantees require us to provide a bill credit (or in limited cases, refund money) to the customer if the solar energy system fails to generate the minimum amount of electricity, as specified in the solar service agreement, in a given term, beginning as early as the first anniversary of the execution of the solar service agreement and annually thereafter. We may also suffer financial losses associated with such credit and refunds if significant performance guarantee payments are triggered. For a description of our performance guarantee obligations, see "*Management's Discussion and Analysis of Financial Condition and Results of Operations—Components of Results of Operations—Revenue*".

We and our dealers are subject to risks associated with installation and other contingencies.

Our dealers design and install solar energy systems and energy storage systems on our behalf. Because the solar service agreement is entered into between us and the customer, we may be liable to our customers for any damage our dealers cause to our customers' homes or businesses, belongings or property during the installation of our solar energy systems and energy storage systems or otherwise.

For example, dealers may penetrate our customers' roofs during the installation process and we may incur liability for the failure to adequately weatherproof such penetrations following the completion of installation of solar energy systems. In addition, because our solar energy systems and energy storage systems are high-voltage energy systems, we may incur liability for a dealer's failure to comply with electrical standards and manufacturer recommendations. Furthermore, prior to obtaining permission to operate our solar energy systems and energy storage systems, the solar energy systems and energy storage systems must pass various inspections. Any delay in passing, or inability to pass, such inspections, would adversely affect our results of operations. Because our profit on a particular solar service agreement and related solar energy system and energy storage system, if applicable, is based in part on assumptions as to the ongoing cost of the related solar energy system and energy storage system, if applicable, cost overruns, delays or other execution issues may cause us to not achieve our expected results or cover our costs for that solar service agreement and related solar energy system and energy storage systems, if applicable.

Product liability claims against us or accidents could result in adverse publicity and potentially significant monetary damages.

It is possible our solar energy systems, energy storage systems or our other sustainable home products could injure our customers or other third parties or those systems or products could cause property damage as a result of product malfunctions, defects, improper installation, fire or other causes. We rely on third-party manufacturing warranties, warranties provided by our dealers and our general liability insurance to cover product liability claims and have not obtained separate product liability insurance. Our solar energy systems, energy storage systems and other sustainable home products or their components could be subject to recalls either to production defects or malfunctions. Any product liability claim we face could be expensive to defend and may divert management's attention. The successful assertion of product liability claims against us could result in potentially significant monetary damages, potential increases in insurance expenses, penalties or fines, subject us to adverse publicity, damage our reputation and competitive position and adversely affect sales of solar energy systems, energy storage systems or other sustainable home products. In addition, product liability claims, injuries, defects or other problems experienced by other companies could lead to unfavorable market conditions to the industry as a whole and may have an adverse effect on our ability to expand our portfolio of customer agreements and related solar energy systems and energy storage systems, thus affecting our business, financial condition and results of operations.

We typically bear the risk of loss and the cost of maintenance, repair and removal on solar energy systems that are owned by our subsidiaries and included in securitization and tax equity vehicles.

We typically bear the risk of loss and are generally obligated to cover the cost of maintenance, repair and removal for any solar energy system we sell to subsidiaries and include in securitization and tax equity vehicles. At the time we enter into a tax equity or securitization transaction, we enter into a maintenance services agreement where we agree to operate and maintain the solar energy system for a fixed fee calculated to cover our future expected maintenance costs. If our solar energy systems require an above-average amount of repairs or if the cost of repairing the solar energy systems were higher than our estimate, we would need to perform such repairs without additional compensation. If our solar energy systems, approximately 44% of which were located in California and Puerto Rico as of December 31, 2023, are damaged as the result of a natural disaster beyond our control, losses could exceed or be excluded from our insurance policy limits and we could incur unforeseen costs that could harm our business and financial condition. We may also incur significant costs for taking other actions in preparation for, or in reaction to, such events. We purchase property insurance with industry standard coverage and limits approved by an investor's third-party insurance advisors to hedge against such risk, but such coverage may not cover our losses.

The installation and operation of solar energy systems and energy storage systems depends heavily on suitable solar and meteorological conditions, which may be impacted by the effects of climate change. If meteorological conditions are unexpectedly unfavorable, the electricity production from our solar energy systems may be substantially below our expectations and our ability to timely deploy new solar energy systems and energy storage systems may be adversely impacted.

Climate change poses a systemic threat to the global economy and is inextricably linked with our business. While our core business model seeks to mitigate climate change and accelerate energy independence, there are inherent climate-related risks to our business operations. Climate change could exacerbate the frequency and severity of weather events in all areas where we operate. Climate change or other factors could also cause prevailing weather patterns to materially change in the future, making it harder to predict the average annual amount of sunlight striking each location where we install a solar energy system and energy storage system. Potential negative effects of climate change include, among others, a temporary decrease in solar availability in certain locations, disruptions in transmission grids and delays or reductions in new installations.

The energy produced and the revenue and cash receipts generated by a solar energy system depend on suitable solar, atmospheric and weather conditions, all of which are beyond our control. Furthermore, components of our systems, such as panels and inverters, could be damaged by severe weather or natural catastrophes, such as hurricanes, freezes, hailstorms, tornadoes, fires or earthquakes. Our economic model and projected returns on our solar energy systems require achievement of certain production results from our systems and, in some cases, we guarantee these results to our consumers. If the solar energy systems underperform for any reason, our business could suffer. For example, the amount of revenue we recognize in a given period from our PPAs and the amount of our obligations under the performance guarantees of our solar service agreements are dependent in part on the amount of energy generated by solar energy systems under such solar service agreements. As a result, revenue derived from our standard PPAs is impacted by seasonally shorter daylight hours in winter months. In addition, the ability of our dealers to install solar energy systems and energy storage systems is impacted by weather. For example, the ability to install solar energy systems and energy storage systems during the winter months in the Northeastern U.S. is limited. Such solar, atmospheric and weather conditions can delay the timing of when solar energy systems and energy storage systems can be installed and when we can originate and begin to generate revenue from solar energy systems. This may increase our expenses and decrease revenue and cash receipts in the relevant periods.

These or other effects could make our solar energy systems less economical overall or make individual solar energy systems less economical. Any of these effects on meteorological conditions could harm our business, financial condition and results of operations.

We may be subject to interruptions or failures in our information technology systems.

We rely on information technology systems and infrastructure to support our business. Any of these systems may be susceptible to damage or interruption due to fire, floods, power loss, telecommunication failures, usage errors by employees, computer viruses, cyberattacks or other security breaches or similar events. For example, we have in the past experienced cybersecurity attacks on our information technology systems or related to software we utilize, and, while none to date have been material, we expect further attacks may occur in the future, some of which may be material. A compromise of our information technology systems or those with which we interact could harm our reputation and expose us to regulatory actions and claims from customers and other persons, any of which could adversely affect our business, financial condition, cash flows and results of operations. If our information systems are damaged, fail to work properly or otherwise become unavailable, we may incur substantial costs to repair or replace them and we may experience a loss of critical information, customer disruption and interruptions or delays in our ability to perform essential functions.

Disruptions to our solar monitoring and metering systems or energy storage control solution could negatively impact our revenues and increase our expenses.

Our ability to monitor solar energy production, energy storage and battery discharge for various purposes, including to accurately charge customers, depends on the operation of our monitoring and metering systems and energy storage control. We have in the past experienced periods where some of our cellular connections have been unavailable and, as a result, we have been forced to estimate the production of their solar energy systems. Such estimates may prove inaccurate and could cause us to underestimate the power being generated by our systems and undercharge our customers, thereby harming our results of operations. We could incur significant expense and disruption to our operations in connection with failures of our solar monitoring and metering systems and energy storage control, including hardware failures and failure or obsolescence of the cellular and other technology that we use to communicate with those meters and controls. For example, many of our meters operate on either the 3G or 4G cellular data networks, which are expected to sunset before the term of our customer agreements, and newer technologies we use today may become obsolete before the end of the term of customer agreements entered into now.

Upgrading our metering solution may cause us to incur significant expense. Hardware may also be damaged or these systems may fail to communicate due to equipment failure, manufacturing defects, natural disasters such as hurricanes, freezes, fires and earthquakes, terrorist attacks, sabotage, vandalism and environmental risks. In addition, sophisticated hardware and operating system software and applications we procure from third parties may contain defects in design or manufacture, including "bugs" and other problems that could unexpectedly interfere with the operation of our solar energy systems or energy storage systems. Should we be unable to continue to license, on agreeable terms, the software necessary to communicate with our meters, it could cause a significant disruption in our business and operations.

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

We receive, store and use personal information of our customers, including names, addresses, e-mail addresses, credit information, credit card and financial account information and other housing or building and energy use information. We also store information of our dealers, including employee, financial and operational information. We rely on the availability of data collected from our customers and our dealers in order to manage our business and market our offerings. We take certain steps in an effort to protect the security, integrity and confidentiality of the personal information we collect, store or transmit, but there is no guarantee inadvertent or unauthorized use or disclosure will not occur or third parties will not gain unauthorized access to this information despite our efforts. We also rely on third-party suppliers or vendors to host certain of the systems we use.

Although we take precautions to provide for disaster recovery, our ability to recover systems or data may be expensive and may interfere with our normal operations. Also, although we obtain assurances from such third parties they will use reasonable safeguards to secure their systems, we may be adversely affected by unavailability of their systems or unauthorized use or disclosure or our data maintained in such systems. Because techniques used to obtain unauthorized access or sabotage systems change frequently and generally are not identified until they are launched against a target, we, our suppliers or vendors and our dealers may be unable to anticipate these techniques or to implement adequate preventative or mitigation measures.

Cyberattacks, including those leveraging artificial intelligence, are becoming more sophisticated and include, but are not limited to, malicious software, attempts to gain unauthorized access to data and other electronic security breaches that could lead to disruptions in critical systems, disruption of our customers' operations, loss or damage to our data delivery systems, unauthorized release of confidential or otherwise protected information, corruption of data and increased costs to prevent, respond to or mitigate cybersecurity events. In addition, certain cyber incidents, such as advanced persistent threats, may remain undetected for an extended period.

Unauthorized use, disclosure of or access to any personal information maintained by us or on our behalf, whether through breach of our systems, breach of the systems of our suppliers, vendors or dealers by an unauthorized party or through employee or contractor error, theft or misuse or otherwise, could harm our business. If any such unauthorized use, disclosure of or access to such personal information were to occur, our operations could be seriously disrupted and we could be subject to demands, claims and litigation by private parties and investigations, related actions and penalties by regulatory authorities.

In addition, we could incur significant costs in notifying affected persons and entities and otherwise complying with the multitude of international, federal, state and local laws and regulations related to the unauthorized access to, use of or disclosure of personal information. Finally, any perceived or actual unauthorized access to, use of or disclosure of such information could harm our reputation, substantially impair our ability to expand our portfolio of customer agreements and related solar energy systems, energy storage systems and other sustainable home products and have an adverse impact on our business, financial condition and results of operations. The recent increase in the number of individuals and companies working remotely and otherwise working online is increasing the attack surface available to criminals. Consequently, the risk of a cybersecurity incident suffered by us or our vendors or service providers is increased, and our investment in risk mitigations against cybersecurity incidents is evolving as the threat landscape changes. While we currently maintain cybersecurity insurance, such insurance may not be sufficient to cover us against claims, and we cannot be certain that cyber insurance will continue to be available to us on economically reasonable terms, or at all, or that any insurer will not deny coverage as to any future claim.

Terrorist or cyberattacks against centralized utilities could adversely affect our business.

Assets owned by utilities such as substations and related infrastructure have been physically attacked in the past and will likely be attacked in the future. These facilities are often protected by limited security measures, such as perimeter fencing. Any such attacks may result in interruption to electricity flowing on the grid and consequently interrupt service to our solar energy systems not combined with an energy storage system, which could adversely affect our operations. Furthermore, cyberattacks, whether by individuals or nation states, against utility companies could severely disrupt their business operations and result in loss of service to customers, which would adversely affect our operations.

We face competition from centralized electric utilities, retail electric providers, independent power producers and renewable energy companies.

The solar energy and renewable energy industries are both highly competitive and continually evolving as participants strive to distinguish themselves within their markets and compete with large centralized electric utilities. We believe our primary competitors are the centralized electric utilities that supply electricity to our potential customers. We compete with these centralized electric utilities primarily based on price (cents per kWh), predictability of future prices (by providing pre-determined annual price escalations) and the ease by which customers can switch to electricity generated by our solar energy systems. We may also compete based on other value-added benefits, such as reliability and carbon-friendly power. If we cannot offer compelling value to our customers based on these factors, our business may not grow.

Centralized electric utilities generally have substantially greater financial, technical, operational and other resources than we do. As a result, these competitors may be able to devote more resources to the research, development, promotion and sale of their products or services or respond more quickly to evolving industry standards and changes in market conditions than we can. Centralized electric utilities could also offer other value-added products or services that could help them to compete with us even if the cost of electricity they offer is higher than ours. In addition, a majority of utilities' sources of electricity is non-solar, which may allow utilities to sell electricity more cheaply than electricity generated by our solar energy systems. Centralized electric utilities could also offer customers the option of purchasing electricity obtained from renewable energy resources, including solar, which would compete with our offerings. Moreover, regulated utilities are increasingly seeking approval to "rate-base" their own solar energy system and energy storage system businesses. Rate-basing means that utilities would receive guaranteed rates of return for their solar energy system and energy storage system businesses. This is already commonplace for utility-scale solar projects and commercial solar projects. While few utilities to date have received regulatory permission to rate-base residential solar energy systems or energy storage systems, our competitiveness would be significantly harmed should more utilities receive such permission because we do not receive guaranteed profits for our solar service offerings.

We also compete with retail electric providers and independent power producers not regulated like centralized electric utilities but that have access to the centralized utilities' electricity transmission and distribution infrastructure pursuant to state, territorial and local pro-competition and consumer choice policies. These retail electric providers and independent power producers are able to offer customers electricity supply-only solutions that are competitive with our solar energy system options on both price and usage of renewable energy technology while avoiding the long-term agreements and physical installations our current business model requires. This may limit our ability to acquire new customers, particularly those who wish to avoid long-term agreements or have an aesthetic or other objection to putting solar panels on their roofs.

We also compete with solar companies with vertically integrated business models, including sales, financing, engineering, manufacturing, installation, maintenance and monitoring services. If the integrated approach of our competitors is successful, it may limit our ability to originate solar energy systems. Many of our vertically integrated competitors are larger than we are. As a result, these competitors may be able to devote more resources to the research, development, promotion and sale of their products or services or respond more quickly to evolving industry standards and changes in market conditions than we can. Solar companies with vertically integrated business models could also offer other value-added products or services that could help them to compete with us. Larger competitors may also be able to access financing at a lower cost of capital than we are able to obtain.

In addition, we compete with other solar companies who sell or finance products directly to consumers, inclusive of programs like Property-Assessed Clean Energy financing programs established by local governments. For example, we face competition from solar installation businesses that seek financing from external parties or utilize competitive loan products or state and local programs.

We also compete with solar companies with business models similar to our own, some of which are marketed to potential customers by our dealers, and we may also face competition from new entrants into the market as a result of the passage of the IRA and its anticipated impacts and benefits to the solar industry. Some of these competitors specialize in the distributed solar energy market and some may provide energy at lower costs than we do. Some of our competitors offer or may offer similar services and products as we do, such as leases, PPAs and direct outright sales of and consumer loan products for solar energy systems. Many of our competitors also have significant brand name recognition, lower barriers to entry into the solar market, greater capital resources than we have and extensive knowledge of our target markets.

We also compete with solar companies that offer community solar products and utility companies that provide renewable power purchase programs. Some customers might choose to subscribe to a community solar project or renewable subscriber programs instead of having a solar energy system installed on their home or business, which could affect our sales. Additionally, some utility companies (and some utility-like entities, such as community choice aggregators in California) have generation portfolios that are increasingly renewable in nature. In California, for example, utility companies and community choice aggregators in that state are required to have generation portfolios comprised of 60% renewable energy by 2030 and state regulators are planning for utility companies and community choice aggregators to sell 100% greenhouse gas free electricity to retail customers by 2045. As utility companies offer increasingly renewable portfolios to retail customers, those customers might be less inclined to have a solar energy system installed on their home or business, which could adversely affect our growth and profitability.

We have historically provided our solar services only to residential customers, but we have expanded to other markets, including commercial and industrial customers. There is intense competition in the solar energy sector in the markets in which we operate and the markets in which we intend to operate. As new entrants continue to enter into these markets, and as we enter into new markets, we may be unable to grow or maintain our operations and we may be unable to compete with companies that have already established themselves in both the residential market and non-residential markets.

As the solar industry grows and evolves, we will also face new competitors and technologies who are not currently in the market (including those resulting from the consolidation of existing competitors). Our industry is characterized by low technological barriers to entry and well-capitalized companies, including utilities and integrated energy companies, could choose to enter the market and compete with us. Our failure to adapt to changing market conditions and to compete successfully with existing or new competitors will limit our growth and profitability and will have a material adverse effect on our business, financial condition and results of operations.

Developments in technology or improvements in distributed solar energy generation and related technologies or components may materially adversely affect demand for our offerings.

Significant developments in technology, such as advances in distributed solar power generation, energy storage solutions such as batteries, energy storage management systems, the widespread use or adoption of fuel cells for residential or commercial properties or improvements in other forms of distributed or centralized power production may materially and adversely affect demand for our offerings and otherwise affect our business. Future technological advancements may result in reduced prices to consumers or more efficient solar energy systems than those available today, either of which may result in current customer dissatisfaction. We may not be able to adopt these new technologies as quickly as our competitors or on a cost-effective basis.

Due to the length of our solar service agreements, the solar energy system deployed on a customer's property may be outdated prior to the expiration of the term of the related solar service agreement, reducing the likelihood of renewal of our solar service agreement at the end of the applicable term and possibly increasing the occurrence of customers seeking to terminate or cancel their solar service agreements or defaults. If current customers become dissatisfied with the price they pay for their solar energy system under our solar service agreements relative to prices that may be available in the future or if customers become dissatisfied by the output generated by their solar energy systems relative to future solar energy system production capabilities, or both, this may lead to customers seeking to terminate or cancel their solar service agreements or higher rates of customer default and have an adverse effect on our business, financial condition and results of operations. Additionally, recent technological advancements may impact our business in ways we do not currently anticipate. Any failure by us to adopt or have access to new or enhanced technologies or processes, or to react to changes in existing technologies, could result in product obsolescence or the loss of competitiveness of and decreased consumer interest in our solar energy services, which could have a material adverse effect on our business, financial condition and results of operations.

Obtaining a customer contract with a potential customer does not guarantee the potential customer will not decide to cancel or that we will not need to cancel due to a failed inspection, which could cause us to generate no revenue despite incurring costs and adversely affect our results of operations.

Even after we secure a customer contract with a potential customer, we (either through our dealers or directly) must perform an inspection to ensure the home, including the rooftop, meets our standards and specifications. If the inspection finds repairs to the rooftop are required in order to satisfy our standards and specifications to install the solar energy system, and a potential customer does not want to make such required repairs, we would lose that anticipated sale. In addition, per the terms of our customer contracts, a customer maintains the ability to cancel before commencement of installation, subject to certain conditions. Any delay or cancellation of an anticipated sale could materially and adversely affect our financial results, as we may have incurred sales-related, design-related and other expenses and generated no revenue.

The value of our solar energy systems at the end of the associated term of the lease or PPA may be lower than projected, which may adversely affect our financial performance, results of operations and valuation.

We depreciate the costs of our solar energy systems over their estimated useful life of 35 years. At the end of the initial term (typically 20 or 25 years) of the lease or PPA, customers may choose to purchase their solar energy systems, ask us to remove the solar energy system at our cost or renew their lease or PPA. Home and business owners may choose to not renew or purchase for any reason, such as pricing, decreased energy consumption, relocation, switching to a competitor product or technological obsolescence of the solar energy system. We are also contractually obligated to remove, store and reinstall the solar energy systems, typically for a fee, if customers need to replace or repair their roofs. Furthermore, it is difficult to predict how future environmental regulations may affect the costs associated with the removal, disposal or recycling of our solar energy systems. If the residual value of the solar energy systems is less than we expect at the end of the customer contract, after giving effect to any associated removal and redeployment costs, we may be required to accelerate the recognition of all or some of the remaining unamortized costs. This could materially impair our future results of operations.

Risks Related to Our Financing Activities

We need to obtain substantial additional financing arrangements to provide working capital and growth capital. If financing is not available to us on acceptable terms when needed, our ability to continue to grow our business would be materially adversely impacted.

Distributed solar power is a capital-intensive business that relies heavily on the availability of debt and equity financing sources to fund solar energy system purchase, design, engineering and other capital expenditures. Our future success depends in part on our ability to raise capital from third-party investors and commercial sources, such as banks and other lenders, on competitive terms to help finance the deployment of our solar energy systems. We seek to minimize our cost of capital in order to improve profitability and maintain the price competitiveness of the electricity produced by, the payments for and the cost of our solar energy systems. We rely on access to capital, including through tax equity financing and indebtedness in the form of debt facilities, asset-backed securities and loan-backed securities, to cover the costs related to bringing our solar energy systems and energy storage systems in service, although our customers ultimately bear responsibility for those costs pursuant to our solar service agreements.

To meet the capital needs of our growing business, we will need to obtain additional debt or equity financing from current and new investors. If any of our current debt or equity investors decide not to invest in us in the future for any reason, or decide to invest at levels inadequate to support our anticipated needs or materially change the terms under which they are willing to provide future financing, we will need to identify new investors and financial institutions to provide financing and negotiate new financing terms. In addition, our ability to obtain additional financing through the asset-backed securities market, loan-backed securities market or other secured debt markets is subject to our having sufficient assets eligible for securitization as well as our ability to obtain appropriate credit ratings. If we are unable to raise additional capital in a timely manner, our ability to meet our capital needs and fund future growth and profitability may be limited.

Delays in obtaining financing could cause delays in expansion in existing markets or entering into new markets and hiring additional personnel. Any future delays in capital raising could similarly cause us to delay deployment of a substantial number of solar energy systems for which we have signed solar service agreements with customers. Our future ability to obtain additional financing depends on banks' and other financing sources' continued confidence in our business model and the renewable energy industry as a whole. It could also be impacted by the liquidity needs of such financing sources themselves. Additionally, it could be impacted by our failure to satisfy certain conditions to receive additional guarantees of certain of our indebtedness from the DOE. We face intense competition from a variety of other companies, technologies and financing structures for such limited investment capital. If we are unable to continue to offer a competitive investment profile, we may lose access to these funds or they may only be available to us on terms less favorable than those received by our competitors. For example, if we experience higher customer default rates than we currently experience, it could be more difficult or costly to attract future financing. Any inability to secure financing could lead us to cancel planned installations, impair our ability to accept new customers or increase our borrowing costs, any of which could have a material adverse effect on our business, financial condition and results of operations. Further, because we must continue to comply with certain additional rules and requirements imposed by the DOE in connection with its loan guarantees, any material noncompliance may result in penalties that limit our ability to access capital.

We enter into securitization structures, warehouse financings and other debt financings that may limit our ability to access the cash of our subsidiaries and include acceleration events that, if triggered, could adversely impact our financial condition.

Since April 2017, we have pooled and transferred eligible solar energy systems, energy storage systems and the related asset receivables into 19 special purpose entities, which sold solar asset-backed notes and solar loan-backed notes to institutional investors, the net proceeds of which were distributed to us. We intend to monetize additional solar energy systems, energy storage systems and other sustainable home products in the future through contributions to new special purposes entities for cash. There is a risk the institutional investors that have purchased the notes issued by these special purpose entities will be unwilling to make further investments at attractive prices. Although the creditors of these special purpose entities have no recourse to our other assets except as expressly set forth in the terms of the notes, the special purpose entities are typically required to maintain a liquidity reserve account, a reserve account for equipment replacements, as well as, in certain cases, reserve accounts to finance purchase option/withdrawal right exercises, storage system replacement or payment of liquidated damages for the benefit of the lenders under the applicable series of notes, each of which are funded from initial deposits or cash flows to the levels specified therein.

The securitization structures, warehouse financings and other debt financings often include certain other features designed to protect investors. The primary feature relates to the availability and adequacy of cash flows in the pool of assets to meet contractual requirements, the insufficiency of which triggers an early repayment of the indebtedness. We refer to this as "early amortization", which may be based on, among other things, a debt service coverage ratio falling or remaining below certain levels or exceeding certain allowable thresholds for customer defaults or delinquencies. In the event of an early amortization, the applicable borrower or notes issuer would be required to repay the affected indebtedness using available collections received from the asset pool. However, the period of ultimate payment would be determined based on the amount and timing of collections received and, in limited circumstances, early amortization may be cured prior to full repayment. An early amortization event would impair our liquidity and may require us to utilize other available contingent liquidity or rely on alternative funding sources, which may not be available at the time. Certain of the securitizations, warehouse financings and other debt financings also contain a "cash trap" feature, which requires excess cash flow to be held in an account based on, among other things, a debt service coverage ratio falling or remaining below certain levels. If the cash trap conditions are not cured within a specified period, then the cash in the cash trap account must be applied to repay the indebtedness. If the cash trap conditions are timely cured, the cash is either released back to the borrower or used to repay the indebtedness at the borrower's option. The indentures of our securitizations also typically contain customary events of default for solar securitizations that may entitle the noteholders to take various actions, including the acceleration of amounts due and foreclosure on the issuer's assets. Any significant payments we may be required to make as a result of these arrangements could adversely affect our financial condition. See "*Management's Discussion and Analysis of Financial Condition and Results of Operations—Liquidity and Capital Resources—Financing Arrangements*".

Servicing our existing debt requires a significant amount of cash. We may not have sufficient cash flow from our business to timely pay our interest and principal obligations and may be forced to take other actions to satisfy our payment obligations.

As of December 31, 2023, our total indebtedness was approximately $7.5 billion and the available borrowing capacity under our credit facilities was $733.0 million. Our ability to make scheduled payments of the principal of, to pay interest on or to refinance our indebtedness depends on our future performance, which is subject to economic, financial, competitive and other factors beyond our control. Our business may not generate cash flow from operations sufficient to service our debt and make necessary capital expenditures to operate our business. If we are unable to generate such cash flow, we may be required to adopt one or more alternatives, such as slowing or ceasing the origination of new customer agreements, selling assets, restructuring debt or obtaining additional debt and equity capital on terms that may be onerous or highly dilutive. Our securitizations are structured so cash flows generated by the pool of solar energy systems, energy storage systems, other sustainable home products and related customer agreements are initially used to repay outstanding principal amounts based on the priority of payments in the agreement. However, should these cash flows decrease below applicable thresholds, all excess cash flows from such asset pool must be applied to pay down the related indebtedness, which would reduce the cash available to otherwise fund our business. Our ability to timely repay or otherwise refinance our indebtedness will depend on the capital markets and our financial condition at such time. We may not be able to engage in any of these activities or engage in these activities on desirable terms, which could result in a default on our debt obligations.

Furthermore, we and our subsidiaries expect to incur additional debt in the future, subject to the restrictions contained in our debt instruments. Increases in our existing debt obligations would further heighten the debt related risk discussed above. In addition, we may not be able to enter into new debt instruments on acceptable terms or at all. If we were unable to satisfy financial covenants and other terms under existing or new instruments, or obtain waivers or forbearance from our lenders, or if we were unable to obtain refinancing or new financings for our working capital, equipment and other needs on acceptable terms if and when needed, our business would be adversely affected.

Restrictive covenants in certain of our debt agreements could limit our growth, profitability and our ability to finance our operations, fund our capital needs, respond to changing conditions and engage in other business activities that may be in our best interests.

Our debt agreements impose operating and financial restrictions on us. These restrictions limit our ability and that of our subsidiaries to, among other things:

- incur additional indebtedness;
- make investments or loans;
- create liens;
- consummate mergers and similar fundamental changes;
- make restricted payments;
- make investments in unrestricted subsidiaries;
- enter into transactions with affiliates; and
- use the proceeds of asset sales.

We may be prevented from taking advantage of business opportunities that arise because of the limitations imposed on us by the restrictive covenants under certain of our debt agreements. The restrictions contained in the covenants could:

- limit our ability to plan for or react to market conditions, to meet capital needs or otherwise to restrict our activities or business plan; and
- adversely affect our ability to finance our operations, enter into acquisitions or divestitures to engage in other business activities that would be in our interest.

A breach of any of these covenants or our inability to comply with the required financial ratios or financial condition tests could result in a default under our debt agreements that, if not cured or waived, could result in acceleration of all indebtedness outstanding thereunder and cross-default rights under our other debt. In addition, in the event of an event of default under one of the credit facilities, the affected lenders could foreclose on the collateral securing such credit facility and require repayment of all borrowings outstanding thereunder. If the amounts outstanding under the credit facilities or any of our other indebtedness were to be accelerated, our assets may not be sufficient to repay in full the amounts owed to the lenders or to our other debt holders.

Volatility and continued increases in interest rates would raise our cost of capital and may adversely impact our business.

Due to recent increases in inflation, the U.S. Federal Reserve has raised its benchmark interest rates. Further increases in the federal benchmark rate could result in an increase in market interest rates, which may increase our interest expense under our variable-rate borrowings and the costs of refinancing existing indebtedness or obtaining new debt. For example, borrowings under our existing warehouse credit facilities accrue interest based on the Secured Overnight Financing Rate ("SOFR") as a benchmark for establishing the rate of interest. Consequently, rising interest rates or continued higher interest rates will increase our cost of capital and may decrease the amount of capital available to us to finance deployment of new solar energy systems, energy storage systems and other sustainable home products. Our future success depends in part on our ability to raise capital from investors and obtain secured lending to help finance the deployment of our customer agreements. As a result, rising interest rates may have an adverse impact on our ability to offer attractive pricing on our customer agreements to our customers. If in the future we have a need for significant borrowings and interest rates increase or continue at high interest rates, that may increase the cost of the systems we purchase, which either would make those systems more expensive for customers, which is likely to reduce demand, or would lower our operating margins, or both.

The majority of our cash flows to date have been from solar service agreements monetized under various tax equity fund structures and secured lending arrangements. One of the components of this monetization is the present value of the payment streams from customers who enter into these long-term solar service agreements. If the rate of return required by capital providers, including debt providers, rises as a result of a rise in interest rates, it will reduce the present value of the customer payment stream and consequently reduce the total value derived from this type of monetization. Any measures we could take to mitigate the impact of rising interest rates on our ability to secure third-party financing could ultimately have an adverse impact on the value proposition we offer our customers or our profitability.

We may not have the ability to raise the funds necessary to settle conversions of the Convertible Notes in cash or to repurchase the Convertible Notes upon a fundamental change, and our future debt may contain limitations on our ability to pay cash upon conversion or repurchase of the Convertible Notes.

Holders of the 0.25% convertible senior notes and 2.625% convertible senior notes (the "Convertible Notes") will have the right to require us to repurchase all or a portion of their Convertible Notes upon the occurrence of a fundamental change under the indenture, which includes certain events such as a change of control, before the maturity date at a fundamental change repurchase price equal to 100% of the principal amount of the Convertible Notes to be repurchased, plus accrued and unpaid special interest, if any. In addition, upon conversion of the Convertible Notes, unless we elect to deliver solely shares of our common stock to settle such conversion (other than paying cash in lieu of delivering any fractional share), we will be required to make cash payments in respect of the Convertible Notes being converted. However, we may not have enough available cash or be able to obtain financing at the time we are required to make repurchases of Convertible Notes surrendered therefor or pay cash for Convertible Notes being converted. In addition, our ability to repurchase the Convertible Notes or to pay cash upon conversions of the Convertible Notes may be limited by law, by regulatory authority or by agreements governing our indebtedness at the time.

Our failure to repurchase Convertible Notes at a time when the repurchase is required by the indenture governing such Convertible Notes or to pay any cash payable on future conversions of the Convertible Notes as required by the indenture would constitute a default. A default under the indenture or the fundamental change itself could also lead to a default under agreements governing our existing or future indebtedness. If the repayment of the related indebtedness were to be accelerated after any applicable notice or grace periods, we may not have sufficient funds to repay the indebtedness and repurchase the Convertible Notes or make cash payments upon conversions thereof.

We are subject to counterparty credit risk with respect to the capped call transactions.

In connection with the pricing of the Convertible Notes, we entered into privately negotiated capped call transactions with certain financial institutions (the "option counterparties"). The option counterparties are financial institutions or affiliates of financial institutions, and we will be subject to the risk that one or more of such option counterparties may default or otherwise fail to perform their obligations under the capped call transactions. Our exposure to the credit risk of the option counterparties will not be secured by any collateral.

If any option counterparty becomes subject to bankruptcy or other insolvency proceedings, with respect to such option counterparty's obligations under the relevant capped call transaction, we will become an unsecured creditor in those proceedings with a claim equal to our exposure at that time under our transactions with that counterparty. Our exposure will depend on many factors but, generally, our exposure will increase if the market price or the volatility of our common stock increases. In addition, upon a default or other failure to perform by an option counterparty, we may suffer more dilution than we currently anticipate with respect to our common stock. We can provide no assurance as to the financial stability or viability of any of the option counterparties.

We may be required to make payments or contribute assets to our investors upon the occurrence of certain events, including one-time reset or true-up payments or upon the exercise of a redemption option by one of our tax equity investors.

Our investors in our tax equity investment funds typically advance capital to us based on, among other things, production capacity estimates. The models we use to calculate prepayments in connection with certain of our tax equity investment funds are updated at a fixed date occurring after placement in service of all applicable solar energy systems or an agreed upon date (typically within the first year of the applicable term) to reflect certain specified conditions, as they exist at such date including the ultimate system size of the equipment that was sold or leased to the tax equity investment fund, the cost thereof, and the date the equipment went into service. In some cases, these true-up models also incorporate any changes in law, which would include any reduction in rates (and thus any reduction in the benefits of depreciation). As a result of this true-up, applicable payments are resized, and we may be obligated to refund a portion of the tax equity investor's prepayments or to contribute additional assets to the tax equity investment fund. In addition, certain of our tax equity fund investors have the right to require us to purchase their interests in the tax equity investment funds after a set period of time, generally at a price equal to the greater of a set purchase price or fair market value of the interests at the time of the repurchase. Any significant refunds, capital contributions or purchases we may be required to make could adversely affect our liquidity or financial condition.

Risks Related to Regulations

We are not currently regulated as an electric public utility under applicable law but may be subject to regulation as an electric utility in the future.

We are not currently regulated as an electric public utility in the U.S. under applicable national, state or other local regulatory regimes where we conduct business. As a result, we are not currently subject to the various federal, state and local standards, restrictions and regulatory requirements applicable to centralized public utilities. Any federal, state or local regulations that cause us to be treated as an electric utility or to otherwise be subject to a similar regulatory regime of commission-approved operating tariffs, rate limitations and related mandatory provisions, could place significant restrictions on our ability to operate our business and execute our business plan by prohibiting, restricting or otherwise regulating our sale of electricity. If we were subject to the same state or federal regulatory authorities as centralized electric utilities in the U.S. and its territories or if new regulatory bodies were established to oversee our business in the U.S. and its territories or in foreign markets we enter, our operating costs would materially increase or we might have to change our business in ways that could have a material adverse effect on our business, financial condition and results of operations.

While we are not regulated as extensively as an electric public utility, we are subject to certain utility-like regulations in jurisdictions such as California, New York, Arizona, Nevada, Florida and Puerto Rico. In New York, distributed energy providers are subject to regulation by the New York Public Service Commission (the "NYPSC") with respect to customer interactions (including contracting and marketing) and are required to comply with the NYPSC's Uniform Business Practices. In connection with approving the Uniform Business Practices, the NYPSC also established an oversight framework under which it could impose other regulatory requirements on distributed energy providers. In Puerto Rico, we are regulated as an electric power company under applicable PREB regulations in connection with the sale and invoicing of energy generated by distributed generation systems having an aggregate capacity of more than 1 megawatt. Among other requirements, these regulations impose certain filing, certification, reporting and annual fee requirements upon us but do not currently subject the companies to centralized utility-like regulation or require the PREB's approval of their charges. In California, the CPUC issued an order approving several consumer protection measures for solar customers, including a requirement for solar providers to provide customers with the California Solar Consumer Protection Guide, which provides customers with information regarding the selection of a contractor, solar financing, bill savings estimates, net energy metering and electric rates, low-income options and related matters. The CPUC order also requires the investor-owned utilities in California to adopt procedures to verify during the interconnection process that the customer received the California Solar Consumer Protection Guide and that the solar provider is licensed, and to collect and report on complaints regarding solar providers. If we become subject to new, additional regulatory requirements in these jurisdictions or other jurisdictions adopt similar regulatory requirements, our operating costs would materially increase or we might have to change our business in ways that could have a material adverse effect on our business, financial condition and results of operations.

Electric utility policies and regulations, including those affecting electric rates, may present regulatory and economic barriers to the purchase and use of solar energy systems that may significantly reduce demand for electricity from our solar energy systems and adversely impact our ability to originate new solar service agreements.

Federal, state and local government regulations and policies concerning the electric utility industry, utility rates and rate structures and internal policies and regulations promulgated by electric utilities, heavily influence the market for electricity generation products and services. These regulations and policies often relate to electricity pricing. Policies and regulations that promote renewable energy and distributed energy generation have been challenged by centralized electric utilities and questioned by those in government and others arguing for less governmental spending and involvement in the energy market. To the extent such views are reflected in government policies and regulations, the changes in such policies and regulations could adversely affect our business, financial condition and results of operations. Furthermore, any effort to overturn federal and state laws, regulations or policies that are supportive of solar energy generation or that remove costs or other limitations on other types of energy generation that compete with solar energy projects could materially and adversely affect our business.

In the U.S., governmental authorities and state public service commissions that determine utility rates, rate structures and the terms and conditions of electric service continuously modify these regulations and policies. These regulations and policies could result in a significant reduction in the potential demand for electricity from our solar energy systems and could deter customers from entering into solar service agreements with us.

With regard to rates, customers with solar energy systems may currently pay or be subject in the future to increased charges due to increased rates or changes in rate design and structures. Utilities in certain jurisdictions may assess fees that apply only to customers with distributed generation systems, including residential or non-residential solar energy systems or impose charges on solar customers that are significantly higher than comparable charges billed to non-solar customers.

These fees may include demand, stand-by or departing load charges or monthly minimum charges. Certain jurisdictions may permit utilities to change their rate design and structures that could result in charges that would disproportionately impact customers with solar energy systems. For example, a reduction in the number of tiers of rates could result in increased charges for lower-demand customers, including many solar customers, by moving them to a new rate tier with higher rates. It could also result in lower charges for higher-demand customers, who may then become less incentivized to consider solar energy to meet their electricity needs. Similarly, a change in rate design to recover more costs from fixed charges as opposed to variable charges (i.e. "decoupled" rates, by which the utility's revenue requirement is "decoupled" from its level of electricity sales in designing rates) may have the same effect. Additionally, depending on the region, electricity generated by solar energy systems competes most effectively with the most expensive retail rates for electricity from the electrical grid, rather than the less expensive average price of electricity. Modifications to the centralized electric utilities' peak hour pricing policies or rate design could make our current product offerings less competitive with the price of electricity from the electrical grid. A shift in the timing of peak rates for utility-generated electricity to include times of day when solar energy generation is less efficient or non-operable could make our solar energy systems less competitive and reduce demand for our product offerings. Time-of-use rates could also result in higher costs for solar customers whose electricity requirements are not fully met by the solar energy system during peak periods.

Utilities in California, New Jersey and Puerto Rico, among other states and jurisdictions, have proposed or received approval by state regulators for such rate measures as described in this risk factor. Any such changes affecting rates could increase our customers' cost to use our solar energy systems and make our service and product offerings less desirable, thereby harming our business, financial condition and results of operations. The imposition of any such rate measures could limit the ability of distributed solar power companies to compete with the price of electricity generated by centralized electric utilities, which may reduce the number of solar energy systems installed in those jurisdictions. Additionally, any such unaccounted for increases in the fees or charges applicable to existing customer agreements may increase the cost of energy to those customers and result in an increased rate of defaults, terminations or cancelations under our solar service agreements. In addition, changes to government or internal utility regulations and policies that favor centralized electric utilities could reduce our competitiveness and cause a significant reduction in demand for our product offerings.

Any of the foregoing results could limit our ability to expand our portfolio of solar service agreements and related solar energy systems and energy storage systems or harm our business, financial condition and results of operations.

We rely on net metering and related policies to offer competitive pricing to our customers in most of our current markets and changes to net metering policies may significantly reduce demand for electricity from solar energy systems.

Net metering is one of several key policies that have enabled the growth of distributed generation solar energy systems in the U.S., providing significant value to certain qualifying residential and commercial customers for electricity generated by their solar energy systems but not directly consumed on-site. Net metering allows a homeowner or a business to pay the local electric utility for power usage net of production from the solar energy system or other distributed generation source. Homeowners or businesses receive a credit for the energy an interconnected solar energy system generates in excess of that needed by the home to offset energy purchases from the centralized utility made at times when the solar energy system is not generating sufficient energy to meet the customer's demand. In many markets, this credit is equal to the retail rate for electricity and in other markets, such as Hawaii and Nevada, the rate is less than the retail rate and may be set, for example, as a percentage of the retail rate or based upon a valuation of the excess electricity. In some states and utility territories, customers are also reimbursed by the centralized electric utility for net excess generation on a periodic basis.

Net metering programs have been subject to legislative and regulatory scrutiny in some states and territories including, but not limited to, California, New Jersey, Arizona, Nevada, Connecticut, Florida, Maine, Kentucky, Puerto Rico and Guam. These jurisdictions, by statute, regulation, administrative order or a combination thereof, have recently adopted or are considering new restrictions and additional changes to net metering programs either on a state-wide basis or within specific utility territories. Many of these measures were introduced and supported by centralized electric utilities. These measures vary by jurisdiction and may include a reduction in the rates or value of the credits customers are paid or receive for the power they deliver back to the electrical grid, caps or limits on the aggregate installed capacity of generation in a state or utility territory eligible for net metering, expiration dates for and phasing out of net metering programs, replacement of net metering programs with alternative programs that may provide less compensation and limits on the capacity size of individual distributed generation systems that can qualify for net metering. Net metering and related policies concerning distributed generation also received attention from federal legislators and regulators.

In California, the CPUC issued an order in 2016 retaining retail-based net metering credits for residential customers of California's major utilities as part of Net Energy Metering 2.0 ("NEM 2.0"). Under NEM 2.0, new distributed generation customers receive the retail rate for electricity exported to the grid, less certain non-bypassable fees. Customers under NEM 2.0 also are subject to interconnection charges and time-of-use rates. Existing customers who receive service under the prior net metering program, as well as new customers under the NEM 2.0 program, currently are permitted to remain covered by them on a legacy basis for a period of 20 years. Proceedings on distributed energy policy and utility rates before the CPUC or legislation concerning these matters could also result in changes that affect customers with distributed generation systems.

In New Jersey, the Board of Public Utilities has the option under state law of limiting participation in the retail rate net metering program if the aggregate capacity of owned and operating systems reaches 5.8% of total annual kWh sold in the state. As of December 31, 2023, that threshold had not yet been reached.

In October 2023, the Arizona Corporation Commission voted to reopen the proceeding that set the level of net metering credits. The value of credits, the current schedule for the step-down of the credit value over time and the length of the period during which the value of credits are locked in for customers may all be subject to review. No final action has been taken at this stage.

In Puerto Rico, legislation enacted in April 2019 requires a study of net metering to be completed within five years, which may result in revisions to the existing rules. However, no changes can be made to retail net metering for five years after the date the legislation was enacted. Meanwhile, "true" net metering will continue to apply, meaning the credit for energy exported by net metering clients will equal the value of such energy under the rate applicable to those clients and accordingly, their charges will be based on their net consumption. Customers subject to this regime will remain covered by it on a legacy basis for a period of 20 years from the date of their net metering agreements.

Net metering customers in Puerto Rico may be impacted by transition charges and other requirements contemplated in a restructuring agreement between PREPA and its creditors, currently pending before the U.S. District Court for the District of

Puerto Rico in bankruptcy-like proceedings under Title III of the PROMESA. Nevertheless, the POA has not been finally adjudicated by the Title III Court and creditors could appeal any final judgement. Hence, the PREPA bankruptcy is ongoing but is nearing its final stages.

In Guam, the Consolidated Commission on Utilities adopted a resolution in 2018 recommending retail rate net metering for customers of the Guam Power Authority be replaced with a "buy all/sell all" or similar program that provides for compensation to homeowners at a lower, avoided cost rate. In other jurisdictions, including Minnesota, Connecticut and parts of Texas, replacing net metering with a "value of distributed energy", "feed-in", or "sell-all/ buy-all" tariff is also being considered or has been adopted.

Net metering and related policies concerning distributed generation have received attention from federal legislators and regulators and challenge by various stakeholders. For example, in April 2020, the New England Ratepayers Association petitioned the FERC to declare its exclusive federal jurisdiction over distributed generation, including residential solar, and to establish new federal customer compensation rates for excess energy in lieu of state net metering programs. While the FERC rejected the petition on procedural grounds, further challenges to net metering based on federal law may occur. Changes in federal law, including those made by statute, regulation, rule or order, could negatively affect net metering or other related policies that otherwise promote and support solar energy and enhance the economic viability of distributed solar.

Additionally, distributed solar customers in certain jurisdictions may be subject to higher charges from centralized electric utilities than non-solar customers and such charges should be evaluated together with the net metering policies in place. If such charges are imposed, the cost savings associated with switching to solar energy may be significantly reduced and our ability to expand our portfolio of solar service agreements and related solar energy systems and energy storage systems and compete with centralized electric utilities could be impacted.

For further discussion of these potential charges and related proposals, see "—*Electric utility policies and regulations, including those affecting electric rates, may present regulatory and economic barriers to the purchase and use of solar energy systems that may significantly reduce demand for electricity from our solar energy systems and adversely impact our ability to originate new solar service agreements*".

Our business currently depends in part on the availability of rebates, tax credits and other financial incentives. The expiration, elimination or reduction of these rebates, credits or incentives or our ability to monetize them could adversely impact our business.

Our business depends in part on current government policies that promote and support solar energy and enhance the economic viability of distributed solar. Revenues from SRECs constituted approximately 7%, 9% and 17% of our revenues for the years ended December 31, 2023, 2022 and 2021, respectively. U.S. federal, state and local governments established various incentives and financial mechanisms to reduce the cost of solar energy and to accelerate the adoption of solar energy. These incentives come in various forms, including rebates, tax credits and other financial incentives such as payments for renewable energy credits associated with renewable energy generation, exclusion of solar energy systems from property tax assessments or other taxes and system performance payments. However, these programs may expire on a particular date, end when the allocated funding is exhausted or be reduced or terminated as solar energy adoption rates increase. For example, New Jersey's SREC program closed in 2020 due to legislation requiring that it be closed by the earlier of the share of electricity sold by the state's utilities supplied by solar reaching 5.1% or June 2021. Following the close of the program in June 2020, customers became eligible for Transitional Renewable Energy Credits ("TRECs") under an interim transitional program replacing SRECs that provides for a lower level of revenue than the SREC program. In July 2021, the New Jersey Board of Public Utilities closed the TREC program effective August 27, 2021 and approved the long-term successor program to the TREC program, which is referred to as the Successor Solar Incentive Program ("SuSI"). Under the SuSI program, which became effective on August 28, 2021, residential facilities are eligible for the Solar Renewable Energy Certificate-II ("SREC-II") incentive. For net metered residential facilities, the SREC-II provides an administratively-determined fixed payment per megawatt hour that is guaranteed for 15 years, but is lower than the level revenue provided by the TREC program. The financial value of certain incentives decreases over time. The value of SRECs in a market tends to decrease over time as the supply of SREC-producing solar energy systems installed in that market increases. If we overestimate the future value of these incentives, it could adversely impact our business, results of operations and financial results. See "*Business—Government Incentives*".

A loss or reduction in such incentives could decrease the attractiveness of new solar energy systems to customers, which could adversely impact our business and our access to capital. We also enter into economic hedges related to expected production of SRECs through forward contracts that require us to physically deliver the SRECs upon settlement. These arrangements may, depending on the instruments used and the level of additional hedges involved, limit any potential upside from SREC production increases. We may be exposed to potential economic loss should a counterparty be unable or unwilling to perform their obligations under the terms of a hedging agreement. In addition, we are exposed to risks related to changes in interest rates and may engage in hedging activities to mitigate related volatility. We may fail to properly hedge these SRECs or may fail to do so economically, which may also adversely affect our results of operations.

The economics of purchasing a solar energy system and energy storage system are also improved by eligibility for accelerated depreciation, also known as the modified accelerated cost recovery system ("MACRS"), which allows for the depreciation of equipment according to an accelerated schedule set forth by the IRS. This accelerated schedule allows a taxpayer, such as us and investors in tax equity financing arrangements, to recognize the depreciation of tangible solar property on a five-year basis even though the useful life of such property is generally greater than five years. We benefit from accelerated depreciation on the solar energy systems and energy storage systems we own. To the extent these policies are changed in a manner that reduces the incentives that benefit our business, we may experience reduced revenues and reduced economic returns, experience increased financing costs and encounter difficulty obtaining financing.

The federal government currently provides for the Section 48(a) ITC, the Section 48E ITC for eligible property that begins construction after 2024 and the Section 25D Credit. Under current law, the Section 48(a) ITC of the Code allows taxpayers to claim an investment tax credit that, depending on the location of a particular project, its size, its ability to satisfy certain labor and domestic content requirements and the category of consumers it serves, can range between 6% and 70% of the basis of certain commercially owned energy property, in each case construction of which begins before 2025. The Section 48E ITC percentage generally will be the same as the percentage for the Section 48(a) ITC. The Section 48E ITC percentage will begin to phase down for projects that began construction after (a) 2033 or (b) if later, the first year after the year in which the U.S. Treasury Department determines greenhouse gas emissions from the production of electricity in the U.S. are no more than 25% of 2022 levels. To be eligible for the Section 48(a) ITC or the Section 48E ITC at the 30% level, the eligible energy property must either (a) meet certain labor and apprenticeship requirements or (b) have a maximum net output of less than one megawatt (as measured in alternating current). Beginning in 2023, we are able to claim the Section 48(a) ITC or the Section 48E ITC, as applicable, for energy storage systems regardless of whether such systems are installed in conjunction with solar energy systems. We would be able to claim the Section 48(a) ITC or the Section 48E ITC, as applicable, when available for solar energy systems or energy storage systems we originate under lease agreements or PPAs based on our ownership of the solar energy system at the time it is placed in service. Additionally, the IRA allows for the transfer of ITCs, increasing opportunities to monetize the relevant credits.

Section 25D of the Code allows an individual to claim a 30% federal tax credit with respect to a residential solar energy system and/or energy storage system that is owned by the homeowner. As a result, the Section 25D Credit is claimed by customers who purchase solar energy systems and/or energy storage systems. This Section 25D Credit will remain at 30% through the end of 2032, reduce to 26% for 2033, reduce to 22% for 2034 and further reduce to 0% after 2034, unless it is extended before that time. The Section 25D Credit reduces the cost of consumer ownership of solar energy systems and/or energy storage systems, such as under the loan program.

The Section 48(a) ITC has been a significant driver of the financing supporting the adoption of residential solar energy systems in the U.S. and the Section 25D Credit has been a significant driver of consumer demand for ownership of solar energy systems. Any reduction in, or expiration of, these tax credits will likely impact the attractiveness of residential solar and could harm our business. For example, we expect the expiration of the Section 25D Credit will increase the cost of consumer ownership of solar energy systems, such as under the loan program.

Applicable authorities may adjust or decrease incentives from time to time or include provisions for minimum domestic content requirements or other requirements to qualify for these incentives. Reductions in, eliminations or expirations of or additional application requirements for governmental incentives could adversely impact our results of operations and ability to compete in our industry by increasing our cost of capital, causing distributed solar power companies to increase the prices of their energy and solar energy systems and reducing the size of our addressable market. In addition, this would adversely impact our ability to attract investment partners and lenders and our ability to expand our portfolio of solar service agreements and related solar energy systems and energy storage systems. See "*Business—Government Incentives*".

Our business depends in part on the regulatory treatment of third-party owned solar energy systems.

Our lease and PPA agreements are third-party ownership arrangements. Retail sales of electricity by third parties such as us face regulatory challenges in some states and jurisdictions, including states and jurisdictions we intend to enter where the laws and regulatory policies have not historically embraced competition to the service provided by the vertically integrated centralized electric utility. Some of the principal challenges pertain to whether third-party owned solar energy systems qualify for the same levels of rebates or other non-tax incentives available for customer-owned solar energy systems, whether third-party owned solar energy systems are eligible at all for these incentives and whether third-party owned solar energy systems are eligible for net metering and the associated significant cost savings. Furthermore, in some states and utility territories, third parties are limited in the way they may deliver solar to their customers. In certain jurisdictions, laws have been interpreted to prohibit the sale of electricity pursuant to PPAs, leading distributed solar energy system providers to use leases in lieu of PPAs, in addition to customer ownership. These regulatory constraints may, for example, give rise to various property tax issues. See "*Risks Related to Taxation*". Changes in law and reductions in, eliminations of or additional requirements for, benefits such as rebates, tax incentives and favorable net metering policies decrease the attractiveness of new solar energy systems to distributed solar power companies and the attractiveness of solar energy systems to customers, which could reduce our acquisition opportunities. Such a loss or reduction could also adversely impact our access to capital and reduce our willingness to pursue solar energy systems due to higher operating costs or lower revenues from leases and PPAs.

Technical and regulatory limitations regarding the interconnection of solar energy systems to the electrical grid may significantly reduce our ability to sell electricity from our solar energy systems in certain markets or delay interconnections and customer in-service dates, harming our growth rate, operations and customer satisfaction.

Technical and regulatory limitations regarding the interconnection of solar energy systems to the electrical grid may curb or slow our growth and operations in key markets. Utilitie*s* throughout the country follow different rules and regulations regarding interconnection and regulators or utilities have or could cap or limit the amount of solar energy that can be interconnected to the grid. Our solar energy systems generally do not provide power to home and business owners until they are interconnected to the grid.

With regard to interconnection limits, the FERC, in promulgating the first form of small generator interconnection procedures, recommended limiting customer-sited intermittent generation resources, such as our solar energy systems, to a certain percentage of peak load on a given electrical feeder circuit. Similar limits have been adopted by many states as a de facto standard and could constrain our ability to market to customers in certain geographic areas where the concentration of solar installations exceeds this limit.

Furthermore, in certain areas, we benefit from policies that allow for expedited or simplified procedures related to connecting solar energy systems and energy storage systems to the electrical grid. We also are required to obtain interconnection permission for each solar energy system from the local utility. In many states and territories, by statute, regulations or administrative order, there are standardized procedures for interconnecting distributed solar energy systems and related energy storage systems to the electric utility's local distribution system. However, approval from the local utility could be delayed as a result of a backlog of requests for interconnection or the local utility could seek to limit the number of customer interconnections or the amount of solar energy on the grid. In some states, such as New Jersey and Massachusetts, certain utilities such as municipal utilities or electric cooperatives are exempt from certain interconnection requirements. If expedited or simplified interconnection procedures are changed or cease to be available, if interconnection approvals from the local utility are delayed or if the local utility seeks to limit interconnections, this could decrease the attractiveness of new solar energy systems and energy storage systems to distributed solar power companies, including us, and the attractiveness of solar energy systems and energy storage systems to customers. Delays in interconnections could also harm our growth rate and customer satisfaction scores. Such limitations or delays could also adversely impact our access to capital and reduce our willingness to pursue solar energy systems and energy storage systems due to higher operating costs or lower revenues from solar service agreements. Such limitations would negatively impact our business, results of operations, future growth, profitability and cash flows.

As adoption of solar distributed generation rises, along with the increased operation of utility-scale solar generation (such as in key markets including California), the amount of solar energy being contributed to the electrical grid may surpass the capacity anticipated to be needed to meet aggregate demand. If solar generation resources reach a level capable of producing an over-generation situation, some existing solar generation resources may have to be curtailed to maintain operation of the electrical grid. In the event such an over-generation situation were to occur, this could also result in a prohibition on the addition of new solar generation resources. The adverse effects of such a curtailment or prohibition without compensation could adversely impact our business, results of operations, future growth, profitability and cash flows.

We and our dealers are subject to risks associated with construction, regulatory compliance and other contingencies.

We utilize our growing dealer network to market, design, construct and install solar energy systems and energy storage systems in each of the markets in which we operate. The marketing and installation of solar energy systems and energy storage systems is subject to oversight and regulation in accordance with national, state and local laws and ordinances related to consumer protection, building, fire and electrical codes, professional codes, safety, environmental protection, utility interconnection, metering and related matters. We also rely on certain of our dealers and third-party contractors to obtain and maintain permits and professional licenses, including as contractors, and other authorizations from various regulatory authorities and abide by their respective conditions and requirements in many of the jurisdictions in which we operate, as well as perform permitting and installation of solar energy systems and energy storage systems using or complying with government sponsored platforms such as SolarAPP+. A failure by us to obtain necessary permits or encounter delays in obtaining or renewing such permits or to use properly licensed dealers and third-party contractors or to use government-sponsored or government-mandated platforms could adversely affect our operations in those jurisdictions. Furthermore, we may become subject to similar regulatory requirements in some jurisdictions in which we operate. It is difficult and costly to track the requirements of every authority with jurisdiction over our operations and our solar energy systems. Separately, we are subject to regulations and potential liability under the Resource Conservation and Recovery Act and the Comprehensive Environmental Response, Compensation, and Liability Act related to the disposal of wastes generated in connection with our operations. Regulatory authorities may impose new government regulations or utility policies, change existing government regulations or utility policies, may seek expansive interpretations of existing regulations or policies pertaining to our services or solar energy systems and energy storage systems or may initiate associated investigations or enforcement actions or impose penalties or reject solar energy systems and energy storage systems. Any of these factors may result in regulatory and/or civil litigation, significant additional expenses to us or our customers, cause delays in our or our dealers' ability to originate solar service agreements or install or interconnect solar energy systems and energy storage systems or cause other harm to our business. As a result, this could cause a significant reduction in demand for our services and solar energy systems and energy storage systems or otherwise adversely affect our business, financial condition and results of operations.

In connection with certain of our financing transactions guaranteed by the DOE, we and certain of our dealers and affiliates may be subject to additional laws and regulations including the Davis-Bacon Act of 1931, as amended ("Davis-Bacon Act"), governing certain prevailing wage requirements, the False Claims Act and similar state laws. These laws and regulations are complex and subject to varying interpretations, and it is possible regulatory authorities could challenge our or our dealers' policies and practices. If we or our dealers fail to comply with these laws, we could be subject to federal or state government investigations or actions or private actions. Additionally, these financing transactions guaranteed by the DOE are subject to satisfaction and certification of certain conditions, including the accuracy of project-related representations and warranties, delivery of updated project-related information, evidence of compliance with the prevailing wage requirements of the Davis-Bacon Act and certification from the DOE's consulting engineer that certain proceeds of the advances are used to reimburse eligible project costs.

Compliance with occupational safety and health requirements and best practices can be costly and noncompliance with such requirements may result in potentially significant monetary penalties, operational delays and adverse publicity.

The installation and ongoing operations and maintenance of solar energy systems and energy storage systems requires individuals hired by us, our dealers or third-party contractors, potentially including our employees, to work at heights with complicated and potentially dangerous electrical systems. The evaluation and modification of buildings as part of the installation process requires these individuals to work in locations that may contain potentially dangerous levels of asbestos, lead, mold or other materials known or believed to be hazardous to human health. There is substantial risk of serious injury or death if proper safety procedures are not followed. Our operations are subject to regulation under OSHA, DOT regulations and equivalent state and local laws. Changes to OSHA or DOT requirements, or stricter interpretation or enforcement of existing laws or regulations, could result in increased costs. If we fail to comply with applicable OSHA or DOT regulations, even if no work-related serious injury or death occurs, we may be subject to civil or criminal enforcement and be required to pay substantial penalties, incur significant capital expenditures or suspend or limit operations. Because individuals hired by us or on our behalf to perform installation and ongoing operations and maintenance of our solar energy systems and energy storage systems, including our dealers and third-party contractors, are compensated on a per project basis, they are incentivized to work more quickly than installers compensated on an hourly basis. While we have not experienced a high level of injuries to date, this incentive structure may result in higher injury rates than others in the industry and could accordingly expose us to increased liability. Individuals hired by or on behalf of us may have workplace accidents and receive citations from OSHA regulators for alleged safety violations, resulting in fines. Any such accidents, citations, violations, injuries or failure to comply with industry best practices may subject us to adverse publicity, damage our reputation and competitive position and adversely affect our business.

A failure to comply with laws and regulations related to interactions by us or our dealers with current or prospective customers could result in negative publicity, claims, investigations and litigation and adversely affect our financial performance.

Our business substantially focuses on customer agreements and transactions with customers. We offer leases, loans and other products and services to consumers by contractors in our dealer networks, who utilize sales people employed by or engaged as third-party service providers of such contractors. We and our dealers must comply with numerous federal, state and local laws and regulations that govern matters related to interactions with consumers, including those pertaining to consumer protection, marketing and sales, privacy and data security, consumer financial and credit transactions, mortgages and refinancings, home improvement contracts, warranties and various means of customer solicitation, including under the laws identified in "*—Our business is subject to consumer protection laws. Such laws and regulatory enforcement policies and priorities are subject to change that may negatively impact our business*". These laws and regulations are dynamic and subject to potentially differing interpretations and various federal, state and local legislative and regulatory bodies may initiate investigations, expand current laws or regulations, or enact new laws and regulations regarding these matters. Changes in these laws or regulations or their interpretation could dramatically affect how we and our dealers do business, acquire customers and manage and use information collected from and about current and prospective customers and the costs associated therewith. We and our dealers strive to comply with all applicable laws and regulations related to interactions with residential and non-residential customers. It is possible, however, these requirements may be interpreted and applied in a manner inconsistent from one jurisdiction to another and may conflict with other rules or the practices of us or our dealers.

Although we require our dealers to meet our consumer compliance requirements and provide regular training to help them do so, we do not control our dealers and their suppliers or their business practices. Accordingly, we cannot guarantee they follow ethical business practices such as fair wage practices and compliance with environmental, safety and other local laws. A lack of demonstrated compliance could lead us to seek alternative dealers or suppliers, which could increase our costs and have a negative effect on our business and prospects for growth and operations. Violation of labor or other laws by our dealers or suppliers or the divergence of a dealer or supplier's labor or other practices from those generally accepted as ethical in the U.S. or other markets in which we do or intend to do business could also attract negative publicity for us and harm our business.

From time to time, we have been included in lawsuits brought by the customers of certain contractors in our networks, citing claims based on the sales practices of these contractors. While we have paid only minimal damages to date, we cannot be sure that a court of law would not determine that we are liable for the actions of the contractors in our networks or that a regulator or state attorney general's office may hold us accountable for violations of consumer protection or other applicable laws by the contractors in selling our loans, leases, and other products and services. Our risk mitigation processes may not be sufficient to mitigate financial harm to us associated with violations of applicable law by our contractors or ensure that any such contractor is able to satisfy its indemnification obligations to us. Any significant judgment against us could expose us to broader liabilities, a need to adjust our distribution channels for our products and services or otherwise change our business model, and could adversely impact our business.

Violations of anti-bribery, anti-corruption and/or international trade laws to which we are subject could have a material adverse effect on our business operations, financial position and results of operations.

We are subject to laws concerning our business operations and marketing activities in the U.S. and its territories where we conduct business. Further, we are subject to the U.S. Foreign Corrupt Practices Act, which generally prohibits companies and their intermediaries from making improper payments to non-U.S. government officials for the purpose of obtaining or retaining business. We currently only operate in the U.S. and its territories. However, in the future we may conduct business outside of the U.S. and operate in parts of the world that experienced governmental corruption to some degree and, in certain circumstances, strict compliance with anti-bribery laws may conflict with local customs and practices. In addition, due to the level of regulation in our industry, our entry into new jurisdictions through internal growth or acquisitions requires substantial government contact where norms can differ from U.S. standards. Additionally, we regularly interact with domestic municipalities and municipal-owned centralized electric utilities. We will consider our interactions with these domestic governmental bodies when designing our policies and procedures and conducting training designed to facilitate compliance with domestic and international anti-bribery laws. Although we believe these policies and procedures will mitigate the risk of violations of such laws, our employees, dealers and agents may take actions in violation of our policies and anti-bribery laws. Any such violation, even if prohibited by our policies, could subject us to criminal or civil penalties or other sanctions, which could have a material adverse effect on our business, financial condition, cash flows and reputation.

Violations of export control and/or economic sanctions laws and regulations to which we are subject could have a material adverse effect on our business operations, financial position and results of operations.

Our products may be subject to export control regulations, including the Export Administration Regulations administered by the U.S. Department of Commerce's Bureau of Industry and Security. We are also subject to foreign assets control and economic sanctions regulations administered by the U.S. Department of the Treasury's Office of Foreign Assets Control, which restrict or prohibit our ability to transact with certain foreign countries, individuals and entities. We currently only operate in the U.S. and its territories. However, export control regulations may restrict our ability to exchange technical information with foreign manufacturers and suppliers and economic sanctions regulations may restrict our ability to source from certain suppliers. In addition, in the future we may conduct business outside of the U.S. We will consider these scenarios when designing our policies and procedures and conducting training designed to facilitate compliance with U.S. export control and economic sanctions laws and regulations. Although we believe these policies and procedures will mitigate the risk of violations of such laws, our employees, dealers and agents may take actions in violation of our policies or these laws. Any such violation, even if prohibited by our policies, could subject us to criminal or civil penalties or other sanctions, which could have a material adverse effect on our business, financial condition, cash flows and reputation.

Our business is subject to complex and evolving privacy and data protection laws. Many of these laws and regulations are subject to change and uncertain interpretation and could result in claims, increased cost of operations or otherwise harm our business.

Consumer personal privacy and data security have become significant issues and the subject of rapidly evolving regulation. Furthermore, federal, state and local government bodies or agencies have in the past adopted, and may in the future adopt, more laws and regulations affecting data privacy. For example, the state of California enacted the California Consumer Privacy Act of 2018 ("CCPA") and California voters approved the California Privacy Rights Act ("CPRA"). The CCPA creates individual privacy rights for consumers and places increased privacy and security obligations on entities handling the personal data of consumers or households. The CCPA went into effect in January 2020 and requires covered companies to provide new disclosures to California consumers, provides such consumers, business-to-business contacts and employees new ways to opt-out of certain sales of personal information, and allows for a new private right of action for data breaches. The CPRA modifies the CCPA and imposes additional data protection obligations on companies doing business in California, including additional consumer rights processes and opt outs for certain uses of sensitive data. The CPRA went into effect in January 2023 and established a new California privacy regulator. In addition, regulators, the CCPA and the CPRA, and similar frameworks, may significantly impact our business activities and require substantial compliance costs that adversely affect our business, operating results, prospects and financial condition. To date, we have not experienced substantial compliance costs in connection with fulfilling the requirements under applicable data privacy and protection frameworks. Although many of these legal frameworks currently impose similar obligations, interpretations and enforcement of these laws continues to evolve. Changes to interpretations or enforcement strategies could create a range of new compliance obligations, which could cause us to incur additional costs. If interpretations or enforcement of these laws deviate significantly in the future, those costs could become even more severe. Furthermore, if we expand to foreign markets we will be subject to additional privacy and data protection laws, such as the General Data Protection Regulation in the European Union.

Any inability to adequately address privacy and security concerns, even if unfounded, or comply with applicable privacy and data protection laws, regulations and policies, could result in additional cost and liability to us, damage our reputation, inhibit sales and adversely affect our business. Furthermore, the costs of compliance with, and other burdens imposed by, the laws, regulations and policies that are applicable to our business may limit the use and adoption of, and reduce the overall demand for, our solutions. If we are not able to adjust to changing laws, regulations and standards related to privacy or security, our business may be harmed. Moreover, as noted above, we are also subject to the possibility of security breaches, some of which may result in a violation of these laws. Finally, if we acquire a company that has violated or is not in compliance with applicable data privacy and protection laws (or contractual provisions), we may experience similar adverse consequences.

Our business is subject to consumer protection laws. Such laws and regulatory enforcement policies and priorities are subject to change that may negatively impact our business.

We must comply with various international, federal, state, and local regulatory regimes, including those applicable to consumer credit transactions, leases, and marketing activities. These laws and regulations, including those applicable to consumer loans and their origination, are subject to change and modification by statute, administrative rules and orders, and judicial interpretation. As a result of infrequent or sparse interpretations, ambiguities in these laws and regulations may create uncertainty with respect to what type of conduct is permitted or restricted under such laws and regulations. Regulators, such as the Federal Trade Commission and the Consumer Financial Protection Board, as well as state attorney generals and agencies, also can initiate inquiries into market participants, which can lead to investigations and, ultimately, enforcement actions. As a result, we are subject to a constantly evolving consumer protection and consumer finance regulatory environment that is difficult to predict and may affect our business.

The laws to which we may be subject to include federal and state laws that prohibit unfair, deceptive or abusive business acts or practices (such as the Federal Trade Commission Act and the Dodd-Frank Act), regulate lease and loan disclosures and terms and conditions (such as the Truth-in-Lending Act and the Consumer Leasing Act), prohibit discrimination (such as the Equal Credit Opportunity Act), and provide additional protections for certain customers in the military (such as the Servicemembers Civil Relief Act). Our business is or may also be subject to federal and state laws that regulate consumer credit report information, data privacy, debt collection, electronic fund transfers, service contracts, home improvement contracting and marketing activities (such as telemarketing, door-to-door sales, and e-mails).

While we have developed policies and procedures designed to assist in compliance with these laws and regulations, no assurance is given that our compliance policies and procedures will be effective. Failure to comply with these laws and with regulatory requirements applicable to our business could subject us to damages, revocation of licenses, class action lawsuits, administrative enforcement actions, civil and criminal liability, settlements, limits on offering certain products and services, changes in business practices, increased compliance costs, indemnification obligations to our capital providers, loan repurchase obligations and reputational damage that may harm our business, results of operations and financial condition.

The highly regulated environment in which our capital providers operate could have an adverse effect on our business.

We and our capital providers are subject to federal and state supervision and regulation. Federal and state regulation of the banking industry, credit unions and other types of capital providers, along with tax and accounting laws, regulations, rules and standards, may limit their operations significantly and control the methods by which they conduct business and when and how they are able to deploy their capital. These requirements may constrain our ability to enter funding program agreements with new capital providers or the ability of our existing capital providers to continue originating loans through our platform. In choosing whether and how to conduct business with us, current and prospective capital providers can be expected to take into account the legal, regulatory and supervisory regimes that apply to them, including potential changes in the application or interpretation of regulatory standards, licensing requirements or supervisory expectations. Regulators may elect to alter standards or the interpretation of the standards used to measure regulatory compliance or to determine the adequacy of liquidity, certain risk management or other operational practices for financial services companies in a manner that impacts capital providers' ability to originate loans through our platform. An inability for an individual or type of capital provider to originate loans through our platform could have an adverse effect on our business, financial condition and cash flows.

Risks Related to Taxation

Our ability to use NOLs and tax credit carryforwards to offset future income taxes is subject to limitation and the amount of such carryforwards may be subject to challenge or reduction.

As of December 31, 2023, we had approximately $1.1 billion of U.S. federal NOLs, a portion of which will begin to expire in 2035, and approximately $309.7 million of U.S. federal tax credit carryforwards, which will begin to expire in 2033. Utilization of our NOLs and tax credit carryforwards depends on many factors, including having current or future taxable income, which cannot be assured. In addition, Section 382 of the Code generally imposes an annual limitation on the amount of NOLs that may be used to offset taxable income by a corporation that has undergone an "ownership change" (as determined under Section 382). An ownership change generally occurs if one or more stockholders (or groups of stockholders, including one or more groups of public stockholders) that are each deemed to own at least 5% of our stock increase their ownership percentage by more than 50 percentage points over their lowest ownership percentage during a rolling three-year period. Similar rules under Section 383 of the Code impose an annual limitation on the amount of tax credit carryforwards, including carryforwards of Section 48(a) ITCs, that may be used to offset U.S. federal income taxes.

We experienced an "ownership change" in August 2020 as defined by Sections 382 and 383 of the Code, which limits our future ability to utilize NOLs and tax credits generated before the "ownership change". However, these limitations do not prevent the use of our NOLs to offset certain built-in gains, including deemed gains with respect to our cost recovery deductions, recognized by us within five years after the ownership change with respect to assets held by us at the time of the ownership change, or the use of our tax credits to offset related tax liabilities, to the extent of our "net unrealized built-in gain" at the time of the ownership change. We have determined that, based upon the size of our net unrealized built-in gain at the time of our 2020 ownership change and our projected recognition of deemed built-in gains in the five years following the ownership change, there is no impact on the balances for deferred taxes or valuation allowance. Another "ownership change" could occur as a result of transactions that increase the ownership percentage of any of our 5% stockholders during a rolling three-year period, including redemptions of our stock, sales of our stock by other deemed 5% stockholders or issuances of stock by us, whether in additional public offerings or otherwise. If such another ownership change occurs, our ability to utilize NOLs and tax credit carryforwards may be subject to further limitation under Sections 382 and 383 of the Code. The application of the aforementioned limitations may cause U.S. federal income taxes to be paid by us earlier than they otherwise would be paid if such limitations were not in effect and could cause such NOLs and tax credit carryforwards to expire unused, in each case reducing or eliminating the benefit of such NOLs and tax credit carryforwards. To the extent we are not able to offset our future taxable income with our NOLs or offset future taxes with our tax credit carryforwards, this would adversely affect our operating results and cash flows if we have taxable income in the future. These same risks can arise in the context of state income and franchise tax given many states conform to federal law and rely on federal authority for determining state NOLs.

Furthermore, the IRS or other tax authorities could successfully challenge one or more tax positions we take, such as the classification of assets under the income tax depreciation rules or the characterization of expenses for income tax purposes, which could reduce the NOLs we generate and/or are able to use.

Our tax positions are subject to challenge by the relevant tax authority.

Our federal and state tax positions may be challenged by the relevant tax authority. The process and costs, including potential penalties for nonpayment of disputed amounts, of contesting such challenges, administratively or judicially, regardless of the merits, could be material. Future tax audits or challenges by tax authorities to our tax positions may result in a material increase in our estimated future income tax or other tax liabilities, which would negatively impact our financial condition.

For example, many of our solar energy systems are located in states or territories that exempt such assets from state, territorial and local sales and property taxes. We believe these solar energy systems are and should continue to be exempt from certain state, territorial and local sales and property taxes; however, some of our solar energy systems are located in certain jurisdictions where the applicability of these exemptions to solar energy systems is the subject of ongoing litigation and possible legislative change or else the jurisdiction's law is uncertain regarding the effect on property and sales tax exemptions of certain complex business reorganizations undergone by us and our subsidiaries. As such, some tax authorities could challenge the availability of these exemptions. If our solar energy systems are determined to be subject to state, territorial or local sales or property taxes, it could negatively impact our financial condition.

Our ability to provide our solar service offerings to home and business owners on an economically viable basis depends in part on our ability to finance these solar energy systems with tax equity investors that depend on particular tax and other benefits.

Historically, there have been a limited number of investors that generate sufficient profits and possess the requisite financial sophistication to benefit from the tax benefits our tax equity vehicles provide, and a lack of depth in this market may limit our ability to complete such tax equity financing. Potential investors seeking tax-advantaged financing must remain satisfied the structures we offer qualify for the tax benefits associated with solar energy systems available to these investors, which depends both on the investors' assessment of tax law and the absence of any unfavorable interpretations of that law. Changes in existing law and interpretations by the IRS and the courts could reduce the willingness of tax equity investors to invest in tax equity vehicles associated with these solar energy system investments or cause these investors to require a larger allocation of customer payments. We are not certain this type of financing will continue to be available to us as the legal and regulatory landscape may shift in a manner that reduces or eliminates the attractiveness of such financing opportunities. For example, in July 2023, the Office of the Comptroller of the Currency, the Board of Governors of the Federal Reserve System and the Federal Deposit Insurance Corporation jointly released a Notice of Proposed Rulemaking to implement a set of rules known as "Basel III", which could substantially increase the capital requirements applicable to large banking organizations with investments in tax equity. These rules, which are proposed to go into effect in 2025, could make tax equity investments significantly less attractive for large banks. Also, the Section 48E ITC percentage will begin to phase down for projects that begin construction after (a) 2033 or (b) if later, the first year after the year in which the U.S. Treasury Department determines greenhouse gas emissions from the production of electricity in the U.S. are no more than 25% of 2022 levels. The IRA also added a new provision that allows taxpayers to transfer certain federal income tax credits that arise after 2022, such as the Section 48(a) ITC, to third parties for cash. While we believe the ability to transfer the ITC is favorable to our business, it is unclear what effect the ability to transfer these tax credits will have on tax equity structures, although we expect the market for tax equity structures to continue for investors who will continue to value benefits that are not transferable, such as accelerated depreciation. Additionally, we may be unable to identify investors interested in engaging in this type of financing with us. As of December 31, 2023, we have formed 31 tax equity vehicles to which investors such as banks and other large financial investors have committed to invest approximately $2.7 billion. The undrawn committed capital for these tax equity vehicles as of December 31, 2023 is approximately $439.4 million. We plan to continue to form new tax equity vehicles as long as existing tax law and regulations make such financing attractive. See "*—Risks Related to Regulations—Our business currently depends in part on the availability of rebates, tax credits and other financial incentives. The expiration, elimination or reduction of these rebates, credits or incentives or our ability to monetize them could adversely impact our business*".

The contractual terms in certain of our tax equity vehicle documents impose conditions on our ability to draw on financing commitments from the tax equity investors, including if an event occurs that could reasonably be expected to have a material adverse effect on the tax equity vehicle or on us. The terms and conditions of our tax equity vehicles can vary and may require us to alter our products, services or product mix. If we do not satisfy such conditions due to events related to our business or a specific tax equity vehicle or developments in our industry or otherwise, and as a result we are unable to draw on existing commitments, it could have a material adverse effect on our business, financial condition, results of operations and liquidity. In addition to our inability to draw on the investors' commitments, we may incur financial penalties for non-performance (including delays in the installation process and interconnection to the power grid of solar energy systems and other factors). Based on the terms of the tax equity vehicle agreements, we will either reimburse a portion of the tax equity investor's capital or pay the tax equity investor a non-performance fee.

Under the terms of certain of our tax equity vehicles, we may be required to make payments to the tax equity investors if certain tax benefits allocated to such tax equity investors are not realized as expected. Our financial condition may be adversely impacted if a tax equity vehicle is required to make any tax-related payments.

Our tax equity vehicles require that, prior to a date that is at least five years after the last project was placed in service, the tax equity investor receives substantially all the non-cash value attributable to the solar energy systems; however, we typically receive a majority of the cash distributions. In the event the tax equity investor has tax liability as a result of its investment and the cash distributions payable to the tax equity investor are not sufficient to pay such tax liability, the amount of distributions payable to us may be reduced. The amounts of potential tax liability (and the potential for a reduced distribution to us) depend on the tax benefits that accrue to such investors from the tax equity vehicles' activities and may be impacted by changes in tax law.

Additionally, we may have payment obligations to our tax equity investors under indemnity obligations contained in those financings. See "*—If the IRS or the U.S. Treasury Department makes a determination that the fair market value of our solar energy systems is materially lower than what we have reported in our tax equity vehicles' tax returns, we may have to pay significant amounts to our tax equity vehicles, our tax equity investors, tax credit buyers and/or the U.S. government. Such determinations could have a material adverse effect on our business and financial condition*" and "*—If our solar energy systems either cease to be qualifying property or undergo certain changes in ownership within five years of the applicable placed in service date, we may have to pay significant amounts to our tax equity vehicles, our tax equity investors, tax credit buyers and/or the U.S. government. Such recapture could have a material adverse effect on our business and financial condition*".

Due to uncertainties associated with estimating the timing and amounts of cash distributions and allocations of tax benefits to such investors, we cannot determine the potential impact on our cash flows under current or future arrangements. Any significant reductions in the cash we expect to receive from these structures could adversely affect our financial condition.

Changes in tax law could adversely affect our business.

U.S. tax law is always subject to change. For example, in August 2022, the U.S. enacted the IRA, which contains significant changes to U.S. tax law including, but not limited to, a corporate minimum tax and 1% excise tax on stock repurchases. Other potential changes to the Code include changes to the U.S. corporate income tax rate and provisions limiting or eliminating various deductions, credits or tax preferences. Interpretations of the Code and regulations promulgated by the IRS are likewise subject to change. As states elect to conform (or else have rolling conformity) to the Code, such interpretations and regulations (including those promulgated by state authorities) could likewise affect our state income and franchise tax obligations. Any future changes in tax law, including changes to U.S. federal, state, territorial or local tax law, could affect our tax position and adversely impact our business.

If the IRS or the U.S. Treasury Department makes a determination that the fair market value of our solar energy systems is materially lower than what we have reported in our tax equity vehicles' tax returns, we may have to pay significant amounts to our tax equity vehicles, our tax equity investors, tax credit buyers and/or the U.S. government. Such determinations could have a material adverse effect on our business and financial condition.

The basis of our solar energy systems we report in our tax equity vehicles' tax returns to claim the Section 48(a) ITC or the Section 48E ITC is based on the appraised fair market value of our solar energy systems. The IRS continues to scrutinize fair market value determinations industry-wide. We are not aware of any IRS audits or results of audits related to our appraisals or fair market value determinations of any of our tax equity vehicles. If, as part of an examination, the IRS were to review the fair market value we used to establish our basis for claiming Section 48(a) ITCs or Section 48E ITCs and successfully assert the Section 48(a) ITCs or the Section 48E ITCs previously claimed should be reduced, we would owe certain of our tax equity vehicles, our tax equity investors or a tax credit buyer an amount equal to the disallowed Section 48(a) ITCs or Section 48E ITCs attributable to each investor's share of the difference between the fair market value used to establish our basis for claiming Section 48(a) ITCs or Section 48E ITCs and the adjusted fair market value determined by the IRS, plus any costs and expenses associated with a challenge to that fair market value, plus a gross up to pay for additional taxes. We could also be subject to tax liabilities, including interest and penalties, based on our share of claimed Section 48(a) ITCs or Section 48E ITCs. To date, we have not been required to make such payments under any of our tax equity vehicles or a tax credit purchase and sale agreement. We have obtained insurance coverage with respect to certain losses that may be incurred should the Section 48(a) ITCs or

Section 48E ITCs previously claimed with respect to our tax equity vehicles be reduced. Any such losses could be outside the scope of these insurance policies or exceed insurance policy limits and we could incur unforeseen costs that could harm our business and financial condition.

If our solar energy systems either cease to be qualifying property or undergo certain changes in ownership within five years of the applicable placed in service date, we may have to pay significant amounts to our tax equity vehicles, our tax equity investors, tax credit buyers and/or the U.S. government. Such recapture could have a material adverse effect on our business and financial condition.

The Section 48(a) ITCs and the Section 48E ITCs are subject to recapture under the Code if a solar energy system either ceases to be qualifying property or undergoes certain changes in ownership within five years of its placed in service date. The amount of Section 48(a) ITCs or Section 48E ITCs subject to recapture decreases by 20% of the claimed amount on each anniversary of a solar energy system's placed in service date. If such a recapture event were to occur, we could owe certain of our tax equity vehicles, our tax equity investors or a tax credit buyer an amount equal to such vehicles' or investors' or buyers' share of the Section 48(a) ITCs or the Section 48E ITCs that were recaptured. We could also be subject to tax liabilities, including interest and penalties, based on our share of recaptured Section 48(a) ITCs or Section 48E ITCs. Any such recapture could have a material adverse effect on our business and financial condition.

Risks Related to Our Common Stock

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

We do not plan to declare dividends on shares of our common stock in the foreseeable future. Additionally, we are currently prohibited from making any cash dividends pursuant to the terms of certain of our credit facilities. Consequently, your only opportunity to achieve a return on your investment in us will be if you sell your common stock at a price greater than you paid for it. There is no guarantee the price of our common stock that will prevail in the market will ever exceed the price you paid for it.

Ownership of our common stock by current stockholders is expected to remain significant.

Due to their ownership percentages, certain key stockholders may have the ability to exercise significant influence over matters submitted to our stockholders for approval. This concentration of ownership may also have the effect of delaying or preventing a change of control of our company or discouraging others from making tender offers for our shares, which could prevent our stockholders from receiving an offer premium for their shares. So long as the key stockholders continue to own a significant amount of our common stock, they will continue to be able to strongly influence all matters requiring stockholder approval, regardless of whether or not other stockholders believe a potential transaction is in their own best interests. In any of these matters, the interests of the key stockholders may differ or conflict with the interests of our other stockholders. In addition, certain of the key stockholders may, from time to time, acquire interests in businesses that directly or indirectly compete with our business, as well as businesses that are significant existing or potential customers. Certain of the key stockholders may acquire or seek to acquire assets we seek to acquire and, as a result, those acquisition opportunities may not be available to us or may be more expensive for us to pursue.

The price of our common stock is volatile and may decline in value.

The market price of our common stock may be influenced by many factors, some of which are beyond our control, including:

- public reaction to our press releases, announcements and filings with the SEC;
- our operating and financial performance;
- fluctuations in broader securities market prices and volumes, particularly among securities of technology and solar companies;
- changes in market valuations of similar companies;
- departures of key personnel;
- commencement of or involvement in litigation;
- variations in our quarterly results of operations or those of other technology and solar companies;
- changes in general economic conditions, financial markets or the technology and solar industries;
- announcements by us or our competitors of significant acquisitions or other transactions;

- changes in accounting standards, policies, guidance, interpretations or principles;
- speculation in the press or investment community;
- actions by our stockholders;
- the failure of securities analysts to cover our common stock or changes in their recommendations and estimates of our financial performance;
- future sales of our common stock, including by large stockholders, or perceptions that such sales might occur; and
- the other factors described in these "*Risk Factors*".

If we fail to comply with the reporting requirements under the Exchange Act or maintain adequate internal control over financial reporting in accordance with Section 404 of the Sarbanes-Oxley Act, it could result in late or non-compliant filings or inaccurate financial reporting and have a negative impact on the price of our common stock or our business.

Effective internal controls are necessary for us to provide timely, reliable financial reporting and prevent fraud. Our accounting predecessor was not a public company and was not required to comply with the reporting requirements of the Exchange Act, or with the standards adopted by the Public Company Accounting Oversight Board in compliance with the requirements of Section 404 of the Sarbanes-Oxley Act regarding internal controls over financial reporting. As a public company, we are required to report our financial results on the timeline and in the form prescribed by the Exchange Act and to evaluate and report on our internal control over financial reporting. This requires management to certify financial and other information in our quarterly and annual reports and provide an annual management report on the effectiveness of internal control over financial reporting.

We are required to disclose material changes made in our internal controls and procedures on a quarterly basis and annually review and report on, and our independent registered public accounting firm must attest to, the effectiveness of our internal control over financial reporting pursuant to Section 404 of the Sarbanes-Oxley Act. Material weaknesses and significant deficiencies may exist when we report on the effectiveness of our internal control over financial reporting as required by reporting requirements under Section 404 of the Sarbanes-Oxley Act of 2002, or the Sarbanes-Oxley Act.

The process of documenting and further developing our internal controls to become compliant with Section 404 has taken a significant amount of time and effort to complete and required significant attention of management. We are continuing to improve our internal controls over financial reporting. We have expended, and anticipate we will continue to expend, significant resources in order to maintain and enhance existing effective disclosure controls and procedures and internal controls over financial reporting. Our current controls and any new controls we develop may become inadequate because of changes in conditions in our business. We may experience higher than anticipated operating expenses, as well as increased independent auditor and other fees and expenses during the implementation of these changes and thereafter.

Certain of our directors have significant duties with, and spend significant time serving, entities that may compete with us in seeking business opportunities and, accordingly, may have conflicts of interest in allocating time or pursuing business opportunities.

Certain of our directors, who are responsible for managing the direction of our operations and acquisition activities, hold positions of responsibility with other entities whose businesses are similar to our business. The existing positions held by these directors may give rise to fiduciary or other duties in conflict with the duties they owe to us. These directors may become aware of business opportunities that may be appropriate for presentation to us as well as to the other entities with which they are or may become affiliated. Due to these existing and potential future affiliations, they may present potential business opportunities to other entities prior to presenting them to us, which could cause additional conflicts of interest. They may also decide certain opportunities are more appropriate for other entities with which they are affiliated and as a result, they may elect not to present those opportunities to us. These conflicts may not be resolved in our favor.

Conflicts of interest could arise in the future between us, on the one hand, and any of our stockholders and its affiliates and affiliated funds and its and their current and future portfolio companies on the other hand, concerning, among other things, potential competitive business activities or business opportunities.

Conflicts of interest could arise in the future between us, on the one hand, and any of our stockholders and its affiliates and affiliated funds and its and their current and future portfolio companies, on the other hand, concerning, among other things, potential competitive business activities or business opportunities. For example, certain of our existing investors and their affiliated funds may invest in companies that operate in the traditional energy industry and solar and other renewable industries. As a result, our existing investors and their affiliates' and affiliated funds' current and future portfolio companies they control may now, or in the future, directly or indirectly, compete with us for investment or business opportunities.

Our governing documents provide that our stockholders and their affiliates and affiliated funds are not restricted from owning assets or engaging in businesses that compete directly or indirectly with us and will not have any duty to refrain from engaging, directly or indirectly, in the same or similar business activities or lines of business as us, including those business activities or lines of business deemed to be competing with us, or doing business with any of our clients, customers or vendors. In particular, subject to the limitations of applicable law, our certificate of incorporation, among other things:

- permits stockholders or their affiliates and affiliated funds and our non-employee directors to conduct business that competes with us and to make investments in any kind of property in which we may make investments; and
- provides that if any of our stockholders or any of its affiliates who is also one of our non-employee directors becomes aware of a potential business opportunity, transaction or other matter, they will have no duty to communicate or offer that opportunity to us.

Our stockholders or their affiliates or affiliated funds may become aware, from time to time, of certain business opportunities (such as acquisition opportunities) and may direct such opportunities to other businesses in which they have invested, in which case we may not become aware of or otherwise have the ability to pursue such opportunity. Further, such businesses may choose to compete with us for these opportunities, possibly causing these opportunities to not be available to us or causing them to be more expensive for us to pursue. In addition, our stockholders or their affiliates and affiliated funds may dispose of their interests in energy infrastructure or other renewable companies or other assets in the future, without any obligation to offer us the opportunity to purchase any of those assets. As a result, our renouncing our interest and expectancy in any business opportunity that may be from time to time presented to any of our stockholders or their affiliates and affiliated funds could adversely impact our business or prospects if attractive business opportunities are procured by such parties for their own benefit rather than for ours.

In any of these matters, the interests of our existing stockholders and their affiliates and affiliated funds may differ or conflict with the interests of our other shareholders. Any actual or perceived conflicts of interest with respect to the foregoing could have an adverse impact on the trading price of our common stock.

Provisions of our charter documents and Delaware law may inhibit a takeover, which could limit the price investors might be willing to pay in the future for our common stock.

Our charter documents authorize our Board to issue preferred stock without stockholder approval and, relatedly, may have the effect of delaying or preventing an acquisition of us or a merger in which we are not the surviving company and may otherwise prevent or slow changes in our Board and management. In addition, some provisions of our certificate of incorporation, amended and restated bylaws and stockholders' agreement could make it more difficult for a third party to acquire control of us, even if the change of control would be beneficial to our stockholders, including:

- limitations on changes of control and business combinations;
- limitations on the removal of directors;
- limitations on the ability of our stockholders to call special meetings;
- establishing advance notice provisions for stockholder proposals and nominations for elections to the Board to be acted upon at meetings of stockholders;
- providing that the Board is expressly authorized to adopt, or to alter or repeal our bylaws; and
- establishing advance notice and certain information requirements for nominations for election to our Board or for proposing matters that can be acted upon by stockholders at stockholder meetings.

These provisions could discourage an acquisition of us or other change in control transactions and thereby negatively affect the price that investors might be willing to pay in the future for our common stock.

Our amended and restated certificate of incorporation designates the Court of Chancery of the State of Delaware and, to the extent enforceable, the federal district courts of the United States of America as the sole and exclusive forum for certain types of actions and proceedings that may be initiated by our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers, employees or agents.

Our amended and restated certificate of organization provides that, unless we consent in writing to the selection of an alternative forum, the sole and exclusive forum for (a) any derivative action or proceeding brought on our or our stockholders' behalf, (b) any action asserting a claim of breach of a fiduciary duty owed by any of our current or former directors, officers, employees, agents and stockholders to us or our stockholders, (c) any action asserting a claim arising pursuant to any provision of the Delaware General Corporation Law, our amended and restated certificate of incorporation or our amended and restated bylaws, (d) any action as to which the Delaware General Corporation Law confers jurisdiction to the Court of Chancery of the

State of Delaware, or (e) any other action asserting a claim that is governed by the internal affairs doctrine shall be the Court of Chancery of the State of Delaware. Our amended and restated certificate of incorporation also provides that, to the fullest extent permitted by applicable law, the federal district courts of the United States are the exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act, subject to and contingent upon a final adjudication in the State of Delaware of the enforceability of such exclusive forum provision.

Notwithstanding the foregoing, the exclusive forum provision does not apply to suits brought to enforce any liability or duty created by the Exchange Act or any other claim for which the federal courts have exclusive jurisdiction. Any person or entity purchasing or otherwise acquiring an interest in any shares of our capital stock shall be deemed to have notice of and to have consented to the forum provisions in our amended and restated certificate of incorporation. These choice-of-forum provisions may limit a stockholder's ability to bring a claim in a judicial forum that he, she or it believes to be favorable for disputes with us or our directors, officers or other employees, which may discourage such lawsuits. Alternatively, if a court were to find these provisions of our amended and restated certificate of incorporation inapplicable or unenforceable with respect to one or more of the specified types of actions or proceedings, we may incur additional costs associated with resolving such matters in other jurisdictions, which could materially adversely affect our business, financial condition and results of operations and result in a diversion of the time and resources of our management and our Board. For example, the Court of Chancery of the State of Delaware recently determined a provision stating that U.S. federal district courts are the exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act is not enforceable.

Future sales of our common stock in the public market, or the perception that such sales may occur, could reduce our stock price, and any additional capital raised by us through the sale of equity or convertible securities may dilute your ownership in us.

We may raise additional capital through the issuance of equity or debt in the future. In that event, the ownership of our existing stockholders would be diluted and the value of the stockholders' equity in common stock could be reduced. If we raise more equity capital from the sale of common stock, institutional or other investors may negotiate terms more favorable than the current prices of our common stock. If we issue debt securities, the holders of the debt would have a claim to our assets that would be prior to the rights of stockholders until the debt is paid. Interest on these debt securities would increase costs and could negatively impact operating results.

In accordance with Delaware law and the provisions of our charter documents, we may issue preferred stock that ranks senior in right of dividends, liquidation or voting to our common stock. The issuance by us of such preferred stock may (a) reduce or eliminate the amount of cash available for payment of dividends to our holders of common stock, (b) diminish the relative voting strength of the total shares of common stock outstanding as a class, or (c) subordinate the claims of our holders of common stock to our assets in the event of our liquidation. Our amended and restated Certificate of Incorporation does not provide stockholders the pre-emptive right to buy shares from us. As a result, stockholders will not have the automatic ability to avoid dilution in their percentage ownership of us.

We cannot predict the size of future issuances of our common stock or securities convertible into common stock or the effect, if any, that future issuances and sales of shares of our common stock will have on the market price of our common stock. Sales of substantial amounts of our common stock (including shares issued in connection with an acquisition), or the perception that such sales could occur, may adversely affect prevailing market prices of our common stock.

The capped call transactions may affect the value of our common stock.

The capped call transactions are expected generally to reduce the potential dilution to our common stock upon any conversion of notes and/or offset any cash payments we are required to make in excess of the principal amount of converted notes, as the case may be, with such reduction and/or offset subject to a cap. In connection with establishing their initial hedges of the capped call transactions, we expect the option counterparties or their respective affiliates to purchase shares of our common stock and/or enter into various derivative transactions with respect to our common stock concurrently with or shortly after the pricing of the Convertible Notes. This activity could increase (or reduce the size of any decrease in) the market price of our common stock at that time.

In addition, the option counterparties or their respective affiliates may modify their hedge positions by entering into or unwinding various derivatives with respect to our common stock and/or purchasing or selling our common stock or other securities of ours in secondary market transactions prior to the maturity of the 0.25% convertible senior notes (and are likely to do so during the observation period for conversions of the 0.25% convertible senior notes following September 1, 2026 or following any repurchase of the 0.25% convertible senior notes by us and during the observation period for conversions of the

2.625% convertible senior notes following November 15, 2027 or following any repurchase of the 2.625% convertible senior notes by us). This activity could also cause or avoid an increase or a decrease in the market price of our common stock.

The potential effect, if any, of these transactions and activities on the market price of our common stock will depend in part on market conditions and cannot be ascertained at this time.

General Risk Factors

We are exposed to the credit risk of our customers and payment delinquencies on our accounts receivable.

Because we have long-term, contractual relationships with our customers which require them to make monthly payments throughout the term of their contract, we are subject to the credit risk of our customers and screen our customers based upon their credit rating in an attempt to mitigate the risk of customer default. As of December 31, 2023, the average FICO® score of our customers for whom we have a FICO® score was 741 at the time of signing the customer agreement. The accuracy of independent third-party information provided to the credit reporting agency cannot be verified. A FICO® score purports only to be a measurement of the relative degree of risk a borrower represents to a lender, i.e., a borrower with a higher score may be less likely to default in payment than a borrower with a lower score.

As of December 31, 2023, approximately 0.9% of our customers were in default under their customer agreements. However, as we grow our business, the risk of customer defaults may increase as credit scores are dynamic and may deteriorate over a 25-year period. During an economic downturn or during periods of rising inflation and interest rates, the risk of customer defaults may increase. In addition, our customers may assign their solar service agreements to other customers who have lower credit scores or we may enter into new solar service agreements in the future with customers who have lower credit scores than our current customers. In addition, future developments, including competition from other renewables, could decrease the attractiveness of our current contracts. Although our solar service agreements grant us the ability to terminate the agreement with the customer and repossess the defaulting customers' solar energy system in certain circumstances, enforcement of these rights under the solar service agreement may be difficult, expensive and time-consuming. Non-solar customer agreements may experience higher delinquency and default rates than our other customer agreements primarily due to the nature of the product and shorter tenor. If we experience increased customer defaults or delinquencies, our revenue, cash distributions from subsidiaries and our ability to raise new investment funds could be adversely affected. If economic conditions worsen, certain of our customers may face liquidity concerns and may be unable to satisfy their payment obligations to us on a timely basis or at all, which could have a material adverse effect on our financial condition and results of operations.

We are not able to insure against all potential risks and we may become subject to higher insurance premiums.

We are exposed to numerous risks inherent in the operation of solar energy systems and energy storage systems, including equipment failure, manufacturing defects, natural disasters such as hurricanes, freezes, fires and earthquakes, terrorist attacks, sabotage, vandalism and environmental risks. Furthermore, components of our solar energy systems and energy storage systems, such as panels, inverters and batteries, could be damaged by severe weather, such as tsunamis, hurricanes, tornadoes, hailstorms or lightning. If our solar energy systems or energy storage systems are damaged in the event of a natural disaster beyond our control, losses could be outside the scope of insurance policies or exceed insurance policy limits and we could incur unforeseen costs that could harm our business and financial condition. We may also incur significant additional costs in taking actions in preparation for, or in reaction to, such events.

Our insurance policies also cover legal and contractual liabilities arising out of bodily injury, personal injury or property damage to third parties and are subject to policy limits. We also maintain coverage for physical damage to our solar energy assets.

However, such policies do not cover all potential losses and coverage is not always available in the insurance market on commercially reasonable terms. In addition, we may have disagreements with our insurers on the amount of our recoverable damages and the insurance proceeds received for any loss of, or any damage to, any of our assets may be claimed by lenders under our financing arrangements or otherwise may not be sufficient to restore the loss or damage without a negative impact on our results of operations. Furthermore, the receipt of insurance proceeds may be delayed, requiring us to use cash or incur financing costs in the interim. To the extent we experience covered losses under our insurance policies, the limit of our coverage for potential losses may be decreased or the insurance rates we have to pay increased. Furthermore, the losses insured through commercial insurance are subject to the credit risk of those insurance companies. While we believe our commercial insurance providers are currently creditworthy, we cannot assure you such insurance companies will remain so in the future.

We may not be able to maintain or obtain insurance of the type and amount we desire at reasonable rates. The insurance coverage we do obtain may contain large deductibles or fail to cover certain risks or all potential losses. In addition, our insurance policies are subject to annual review by our insurers and may not be renewed on similar or favorable terms, including coverage, deductibles or premiums, or at all. If a significant accident or event occurs for which we are not fully insured or we suffer losses due to one or more of our insurance carriers defaulting on their obligations or contesting their coverage obligations, it could have a material adverse effect on our business, financial condition and results of operations.

The loss of one or more members of our senior management or key employees may adversely affect our ability to implement our strategy.

We depend on our experienced management team and the loss of one or more key executives could have a negative impact on our business. In particular, we are dependent on the services of our founder and CEO, William J. Berger. We also depend on our ability to retain and motivate key employees and attract qualified new employees. None of our key executives are bound by employment agreements for any specific term. We may be unable to replace key members of our management team and key employees if we lose their services. Integrating new employees into our team could prove disruptive to our operations, require substantial resources and management attention and ultimately prove unsuccessful. An inability to attract and retain sufficient managerial personnel who have critical industry experience and relationships could limit or delay our strategic efforts, which could have a material adverse effect on our business, financial condition and results of operations.

Our inability to protect our intellectual property could adversely affect our business. We may also be subject to intellectual property rights claims by third parties, which are extremely costly to defend, could require us to pay significant damages and could limit our ability to use certain technologies.

Any failure to protect our proprietary rights adequately could result in our competitors offering similar solar technology or energy storage services more quickly than anticipated, potentially resulting in the loss of some of our competitive advantage and a decrease in our revenue that would adversely affect our business prospects, financial condition and operating results. Our success depends, at least in part, on our ability to protect our core technology and intellectual property. We rely on intellectual property laws, primarily a combination of copyright and trade secret laws in the U.S., as well as license agreements and other contractual provisions, to protect our proprietary technology and brand. We cannot be certain our agreements and other contractual provisions will not be breached, including a breach involving the use or disclosure of our trade secrets or know-how, or that adequate remedies will be available in the event of any breach. In addition, our trade secrets may otherwise become known or lose trade secret protection.

We cannot be certain our products and our business do not or will not violate the intellectual property rights of a third party. Third parties, including our competitors, may own patents or other intellectual property rights that cover aspects of our technology or business methods. Such parties may claim we have misappropriated, misused, violated or infringed third-party intellectual property rights and if we gain greater recognition in the market, we face a higher risk of being the subject of claims we have violated others' intellectual property rights. Any claim we violated a third party's intellectual property rights, whether with or without merit, could be time-consuming, expensive to settle or litigate and could divert our management's attention and other resources, all of which could adversely affect our business, results of operations, financial condition and cash flows. If we do not successfully settle or defend an intellectual property claim, we could be liable for significant monetary damages and could be prohibited from continuing to use certain technology, business methods, content or brands. To avoid a prohibition, we could seek a license from third parties, which could require us to pay significant royalties, increasing our operating expenses. If a license is not available at all or not available on commercially reasonable terms, we may be required to develop or license a non-violating alternative, either of which could adversely affect our business, results of operations, financial condition and cash flows.

We currently use or plan to use software that is licensed under "open source", "free" or other similar licenses that may subject us to liability or require us to release the source code of our proprietary software to the public.

We currently use open source software that is licensed under "open source", "free" or other similar licenses. Open source software is made available to the general public on an "as-is" basis under the terms of a non-negotiable license. If we fail to comply with these licenses, we may be subject to certain conditions, including requirements that we offer our services that incorporate the open source software for no cost, we make available source code for modifications or derivative works we create based upon incorporating or using the open source software and we license such modifications or alterations under the terms of the particular open source license. We do not plan to integrate our proprietary software with this open source software in ways that would require the release of the source code of our proprietary software to the public. However, our use and distribution of open source software may entail greater risks than use of third-party commercial software. Our authorized developers may contribute to this open source software community but they will be prohibited from providing any proprietary process or proprietarily developed source code of ours. Open source licensors generally do not provide warranties or other contractual protections regarding infringement claims or the quality of the code. In addition, if we combine our proprietary software with open source software in a certain manner, we could, under certain open source licenses, be required to release the source code of our proprietary software to the public. This would allow our competitors to create similar offerings with lower development effort and time. We may also face claims alleging noncompliance with open source license terms or infringement or misappropriation of proprietary software.

These claims could result in litigation, require us to purchase a costly license or require us to devote additional research and development resources to change our software, any of which would have a negative effect on our business and operating results. In addition, if the license terms for open source software that we use change, we may be forced to re-engineer our technology platform or incur additional costs.

Although we monitor our use of open source software to avoid subjecting our technology platform to unintended conditions, few courts have interpreted open source licenses and there is a risk these licenses could be construed in a way that could impose unanticipated conditions or restrictions on our business. We cannot guarantee we have incorporated open source software in our software in a manner that will not subject us to liability or in a manner consistent with our current policies and procedures.

We may become involved in the future in legal proceedings that could adversely affect our business.

We may, from time to time, be involved in litigation and claims, such as those related to employees, customers, our dealers or other third parties with whom we contract, including consumer claims and class action lawsuits. In the ordinary course of business, we have disputes with dealers and customers. In general, litigation claims or regulatory proceedings can be expensive and time consuming to bring or defend against, may result in the diversion of management attention and resources from our business and business goals and could result in injunctions or other equitable relief, settlements, penalties, fines or damages that could significantly affect our results of operations and the conduct of our business. It is impossible to predict with certainty whether any resulting liability would have a material adverse effect on our financial position, results of operations or cash flows.

Our actual financial results may differ materially from any guidance we may publish from time to time.

We may, from time to time, provide guidance regarding our future performance that represents our management's estimates as of the date such guidance is provided. Any such guidance would be based upon a number of assumptions with respect to future business decisions (some of which may change) and estimates, while presented with numerical specificity, are inherently subject to significant business, economic and competitive uncertainties and contingencies (many of which are beyond our control). Guidance is necessarily speculative in nature and it can be expected some or all the assumptions that inform such guidance will not materialize or will vary significantly from actual results. Our ability to meet any forward-looking guidance is impacted by a number of factors including, but not limited to, the number of our solar energy systems sold versus leased, changes in installation costs, the availability of additional financing on acceptable terms, changes in the retail prices of traditional utility-generated electricity, the availability of rebates, tax credits and other incentives, changes in policies and regulations including net metering and interconnection limits or caps, the availability of solar panels, inverters, batteries and other raw materials, as well as the other risks to our business described in this *"Risk Factors"* section. Accordingly, our guidance is only an estimate of what management believes is realizable as of the date such guidance is provided. Actual results may vary from such guidance and the variations may be material. Investors should also recognize the reliability of any forecasted financial data diminishes the farther into the future the data is forecast. In light of the foregoing, investors should not place undue reliance on our financial guidance and should carefully consider any guidance we may publish in context.

If we are unable to make acquisitions on economically acceptable terms, our future growth and operations could be limited, and any acquisitions we may make may reduce, rather than increase, our cash flows.

We may make acquisitions of solar energy systems, energy storage systems and related businesses and joint ventures. The consummation and timing of any future acquisitions will depend upon, among other things, whether we are able to:

- identify attractive acquisition candidates;
- negotiate acceptable purchase agreements;
- obtain any required governmental or third party consents;
- obtain financing for these acquisitions on economically acceptable terms, which may be more difficult at times when the capital markets are less accessible; and
- outbid any competing bidders.

Additionally, any acquisition involves potential risks, including, among other things:

- mistaken assumptions about assets, revenues and costs of the acquired company, including synergies and potential growth;
- an inability to secure adequate customer commitments to use the acquired systems or facilities;
- an inability to successfully integrate the assets or businesses we acquire;
- coordinating geographically disparate organizations, systems and facilities;
- the assumption of unknown liabilities for which we are not indemnified or for which our indemnity is inadequate;
- mistaken assumptions about the acquired company's suppliers or dealers or other vendors;
- the diversion of management's and employees' attention from other business concerns;
- unforeseen difficulties operating in new geographic areas and business lines;
- customer or key employee losses at the acquired business; and
- poor quality assets or installation.

If we consummate any future acquisitions, our capitalization, results of operations, future growth and profitability may change significantly and our stockholders will not have the opportunity to evaluate the economic, financial and other relevant information we will consider in deciding to engage in these future acquisitions, which may not improve our results of operations or cash flow to the extent we projected.

Adverse developments affecting the financial services industry, such as actual events or concerns involving liquidity, defaults or non-performance by financial institutions or transactional counterparties, could adversely impact our business, financial condition and results of operations.

Actual events involving limited liquidity, defaults, non-performance or other adverse developments that affect financial institutions or other companies in the financial services industry or the financial services industry generally, or concerns or rumors about any events of these kinds or other similar risks, have in the past and may in the future lead to market-wide liquidity problems. We maintain deposits at financial institutions as a part of doing business that could be at risk if another similar event were to occur. Our ongoing cash management strategy is to maintain the majority of our deposit accounts in large "money center" financial institutions, but there can be no assurance this strategy will be successful. Increasing concerns regarding the U.S. or international financial systems, including bank failures and bailouts, and their potential broader effects and potential systemic risk on the banking sector generally, may adversely affect our access to capital. Any decline in available funding or access to our cash and liquidity resources could, among other risks, limit our ability to meet our capital needs and fund future growth and operations or fulfill our other obligations, or result in breaches of our financial and/or contractual obligations. Any of these impacts, or any other impacts resulting from the factors described above or other related or similar factors not described above, could have material adverse impacts on our business, financial condition and results of operations.

Item 1B. Unresolved Staff Comments.

Not applicable.

Item 1C. Cybersecurity.

Cybersecurity, Risk Management and Strategy

Sunnova allocates significant resources to preventing, identifying, and mitigating cybersecurity threats to our technology infrastructure and data.

Managing Material Risks and Integrated Overall Risk Management

A focused team of technology professionals works throughout the year to assess and monitor all matters of risk related to cybersecurity. This team is managed by our Chief Information Security Officer ("CISO"), who oversees cybersecurity processes and controls. We deploy a robust combination of security technologies as technical safeguards throughout our network and utilize a defense-in-depth security methodology to protect, detect and react to threats to our systems and data. We conduct cybersecurity maturity and posture assessments twice annually and adjust our efforts to adapt to the evolving industry and threat landscape. Cybersecurity risks are also assessed as part of our Annual Enterprise Risk Assessment. Our risk management strategy includes multiple programs that manage cybersecurity risk, including the following:

- Alignment of our program with the National Institute of Standards and Technology Cybersecurity Framework ("NIST CSF") to prevent, detect and respond to cyberattacks
- Our Incident Response Program outlines how we process incidents and events from identification to completion with clear definitions on roles, classifications, materiality guidelines and additional processes to support response efforts according to the NIST CSF.
- An information security training program that requires all company employees and contractors with access to our networks to participate in regular and mandatory training on how to be aware of, and help defend against, cyber risks, combined with year-round awareness testing and re-training as necessary
- Regular and robust testing of our systems and processes to assess our cybersecurity posture and resilience, which includes internal and external penetration testing performed by third-party vendors and tabletop incident response exercises
- Coordinated engagements with the Department of Homeland Security and Cyber & Infrastructure Security Agency to ensure alignment with industry and government standards and leverage access to agency resources
- Cybersecurity insurance coverage to mitigate the risk of cybersecurity incidents and review of this coverage annually

Results of all assessments, events and test results inform cybersecurity program direction and activities taken throughout the year.

Engaging Third Parties on Risk Management

Recognizing the complexity and evolving nature of cybersecurity risk, we leverage strategic external partnerships to assist with assessing and mitigating cybersecurity threats to us. For example, we utilize a third-party managed security service provider who performs security operations center consulting and investigative duties as a backup to our in-house dedicated cybersecurity team.

Managing Third-Party Risk

We recognize the risks associated with the use of vendors, service providers and other third parties that provide information system services to us, process information on our behalf or have access to our information systems, and we have processes in place to oversee and manage these risks. We conduct thorough security assessments of these third parties engagement and maintain ongoing monitoring to ensure compliance with our cybersecurity standards.

Risks from Cybersecurity Incidents

As of December 31, 2023, we have identified no security incidents or breaches that are material, or likely to be material, to our business strategy, results or financial condition. As such, we have not allocated any material capital towards addressing information security breaches in the last three years, nor have we incurred any material expenses from penalties and settlements related to a material breach during this period. The materiality of an incident is determined by a team convened for an incident, according to guidelines set forth in our incident response policy and process documentation. We believe we are adequately insured against losses related to possible information security breaches and we maintain cybersecurity insurance coverage that we believe is appropriate for the size and complexity of our business.

Board Governance and Oversight

We involve multiple levels of oversight as a part of our approach to cybersecurity risk management.

Risk Management Personnel

Our CISO is responsible for the oversight, implementation and compliance of our cybersecurity program and mitigation of cyber-related risks. Our current CISO has more than 20 years of industry experience and over 5 years of experience with development, training and controls of effective enterprise cybersecurity programs. Our CISO's responsibilities include, but are not limited to, (a) reviewing our enterprise risk register and functional risk register, (b) maintaining adequate processes to manage the identified risks under our cybersecurity program, (c) analyzing logs of cybersecurity threats and vulnerabilities, (d) overseeing prevention, detection, mitigation and remediation efforts and (e) developing, maintaining and ensuring team familiarity with the above mentioned incident response plan. Additionally, we maintain an experienced information technology team at the employee level that supports the implementation of our cybersecurity program and internal reporting, security and mitigation functions.

Board of Director Oversight

Our Board has delegated oversight of risks from cybersecurity threats, as well as overall Enterprise Risk Management, to our audit committee. The audit committee reviews and evaluates the effectiveness of our cybersecurity frameworks, policies, programs, opportunities and risk profile, as well as our business continuity and disaster recovery efforts. Members of our audit committee have cybersecurity experience from their principal occupation or other professional experience. Members of information technology management, including our CISO, regularly report on our cybersecurity matters to both the audit committee of our Board and the full Board, as follows:

- Management provides quarterly reports to the audit committee regarding our cybersecurity program and risks, and the audit committee in turn provides reports to the full Board as needed. All incidents with critical functional impact are escalated to the Board and audit committee.
- Current information security concerns that arise during the year are escalated in real-time to leadership based on the process defined in our Incident Response Plan. All events and incidents are evaluated against our prioritization and informational impact matrices outlined the plan.

We recognize cyber threats are a permanent part of the overall risk landscape and cybersecurity threats are constantly evolving. For these and other reasons, cybersecurity is a top risk management priority for us.

Item 2. Properties.

Our corporate headquarters is in Houston, Texas, where we occupy approximately 73,800 square feet of office space pursuant to an operating lease that expires in July 2029. We lease additional offices in Texas, Guam, California, Florida, Nevada, Mississippi, New York and Puerto Rico, but do not own any real property. We intend to procure additional space in the future as we continue to add employees and expand geographically. We believe our facilities are adequate and suitable for our current needs and, should it be needed, suitable additional or alternative space will be available to accommodate our operations.

Item 3. Legal Proceedings.

Although we may, from time to time, be involved in litigation, claims and government proceedings arising in the ordinary course of business, we are not a party to any litigation or governmental or other proceeding we believe will have a material adverse impact on our financial position, results of operations or liquidity. In the ordinary course of business, we have disputes with dealers and customers. In general, litigation claims or regulatory proceedings can be expensive and time consuming to bring or defend against, may result in the diversion of management attention and resources from our business and business goals and could result in settlement or damages that could significantly affect financial results and the conduct of our business.

On February 16, 2024, a purported stockholder class action was filed against us and certain of our individual executives in the Southern District of Texas, Houston Division. The plaintiff, who seeks to certify a class of persons who purchased our stock between February 25, 2020 and December 7, 2023, alleges that certain statements made during the class period about our business, operations and compliance policies were false and misleading, specifically that we failed to disclose we engaged in improper business practices with respect to disadvantaged homeowners and communities. We believe the lawsuit to be without merit and intend to vigorously defend ourselves. We have not yet been served with the lawsuit.

Item 4. Mine Safety Disclosures.

Not applicable.

PART II

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

Market Information

Our common stock began trading on the NYSE under the symbol "NOVA" on July 25, 2019.

Holders

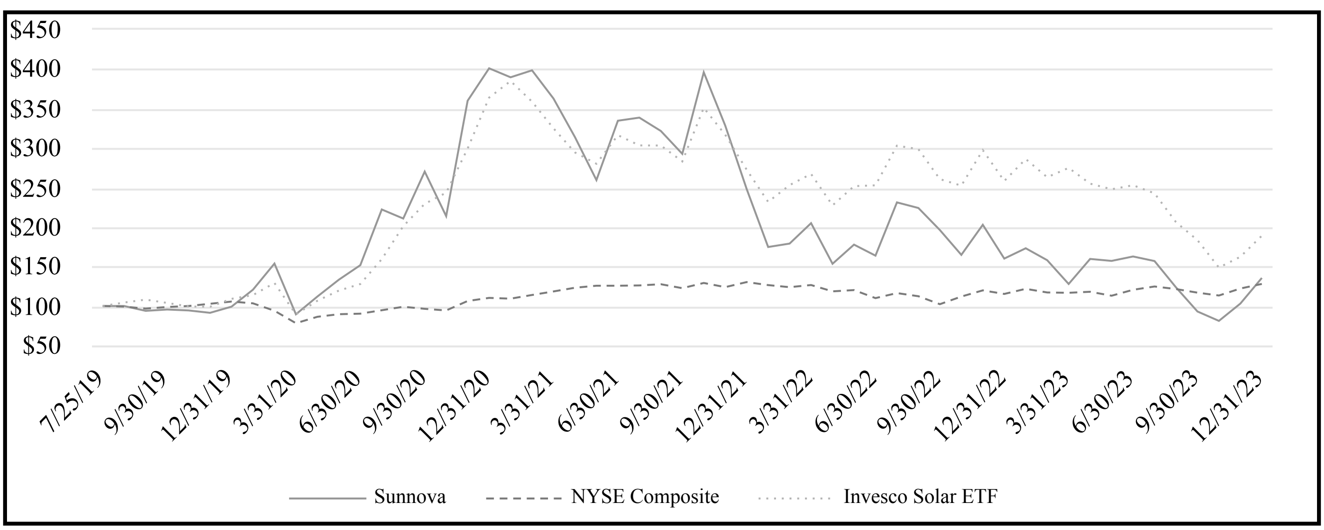
As of February 19, 2024, there were approximately 31 holders of record of our common stock. Certain shares are held in "street" name and, accordingly, the number of beneficial owners of such shares is not known or included in the foregoing number.

Dividends

We have never declared or paid any cash dividends on our capital stock. We currently intend to retain all available funds and any future earnings for use in the operation of our business and do not expect to pay any dividends on our capital stock in the foreseeable future. Any future determination to declare dividends will be made at the discretion of our Board, subject to applicable laws, and will depend on a number of factors, including our financial condition, results of operations, capital requirements, contractual restrictions, general business conditions and other factors our Board may deem relevant. In addition, the terms of our credit agreements and indentures contain restrictions on the payment of dividends and we may also enter into other credit agreements, indentures or other borrowing arrangements in the future that will restrict our ability to declare or pay cash dividends on our capital stock.

Performance Graph

The following stock performance graph compares our total stock return with the total return for (a) the NYSE Composite Index and the (b) the Invesco Solar ETF, which represents a peer group of solar companies, for the period from July 25, 2019 (the date our common stock commenced trading on the NYSE) through December 31, 2023. The figures represented below assume an investment of $100 in our common stock at the closing price of $11.25 on July 25, 2019 and in the NYSE Composite Index and the Invesco Solar ETF on July 25, 2019, including the reinvestment of dividends into shares of common stock. The comparisons in the table are required by the SEC and are not intended to forecast or be indicative of possible future performance of our common stock. This graph shall not be deemed "soliciting material" or be deemed "filed" for purposes of Section 18 of the Exchange Act, or otherwise subject to the liabilities under that section, and shall not be deemed to be incorporated by reference into any of our filings under the Securities Act, whether made before or after the date hereof and irrespective of any general incorporation language in any such filing.



Unregistered Sales of Equity Securities and Use of Proceeds

We did not have any sales of unregistered equity securities during the years ended December 31, 2023, 2022 and 2021 that we have not previously reported on an Annual Report on Form 10-K, Quarterly Report on Form 10-Q or Current Report on Form 8-K.

Item 6. [Reserved]

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

The following discussion and analysis contain forward-looking statements that are subject to risks, uncertainties and assumptions. Our actual results and timing of selected events may differ materially from those anticipated in these forward-looking statements as a result of many factors, including but not limited to those discussed under "Special Note Regarding Forward-Looking Statements", "Risk Factors" and elsewhere in this Annual Report on Form 10-K. Moreover, we operate in a very competitive and rapidly changing environment and new risks emerge from time to time. It is not possible for our management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. In light of these risks, uncertainties and assumptions, the forward-looking events and circumstances discussed in this Annual Report on Form 10-K may not occur and actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements. Unless the context otherwise requires, the terms "Sunnova," "the Company," "we," "us" and "our" refer to SEI and its consolidated subsidiaries.

Company Overview

We are an industry-leading energy services company focused on making clean energy more accessible, reliable and affordable for homeowners and businesses, serving over 419,000 customers in more than 45 U.S. states and territories. Through our adaptive energy platform, we provide a better energy service at a better price to deliver our mission of powering energy independence.

We partner with local dealers and contractors who originate, design and install our customers' solar energy systems, energy storage systems and related products and services on our behalf, as well as other sustainable home solutions, such as home security and monitoring, smart home devices, modern HVAC, generators, upgraded roofing, water systems, water heaters, main panel upgrades and electric vehicle chargers. Our focus on our dealer and contractor model enables us to leverage our dealers' and contractors' specialized knowledge, connections and experience in local markets to drive customer origination while providing our dealers and contractors with access to high quality products at competitive prices, as well as technical oversight and expertise. We believe this structure provides operational flexibility, reduces exposure to labor shortages and lowers fixed costs relative to true vertically integrated models.

We offer customers products to power and improve the energy efficiency and sustainability of their homes and businesses with affordable solar energy and related products and services. We are able to offer energy generation savings compared to utility-based retail rates with little to no up-front expense to the customer in conjunction with solar and solar plus energy storage products, and, in the case of the latter, are able to also provide energy resiliency. Our customer agreements typically take the form of a lease, PPA, loan or cash purchase; however, we also offer service plans for systems we did not originate. We make it possible in some states for a customer to obtain a new roof and/or other sustainable home products as part of their solar loan agreement or as an accessory loan to their lease or PPA. Customers who are not interested in a new solar energy system or energy storage system may also finance a new roof and other sustainable home products via a stand-alone loan from us. We also allow customers originated through our homebuilder channel the option of purchasing the products when the customer closes on the purchase of a new home. Service is an integral part of our agreements and includes operations and maintenance, monitoring, repairs and replacements, equipment upgrades, on-site power optimization for the customer (for both supply and demand), the ability to efficiently switch power sources between the solar energy system and/or energy storage system, and the grid, as appropriate, and also the solar energy system and energy storage system diagnostics. During the life of the contract, we have the opportunity to integrate related and evolving servicing and monitoring technologies and other sustainable home products to upgrade the flexibility and reduce the cost of our customers' energy supply.

In the case of leases and PPAs, we also currently receive tax benefits and other incentives from federal, state and local governments, a portion of which we finance through tax equity, tax credit sales, non-recourse debt structures and hedging arrangements in order to fund our upfront costs, overhead and growth investments.

In addition to providing ongoing service as a standard component of our customer agreements, we also offer ongoing energy services to customers who purchased their solar energy system through third parties. Under these arrangements, we agree to provide monitoring, maintenance and/or repair services to these customers for the life of the service contract they sign with us. In addition, we offer one-time repair services to customers who purchased their solar energy systems or sustainable home products through third parties that are not otherwise covered by warranty. We also offer complementary products as well as non-solar financing. Specifically, our offerings include a non-solar loan program enabling customers to finance the purchase of products independent of a solar energy system or energy storage system. We believe the quality and scope of our comprehensive energy service offerings, whether to customers that obtained their solar energy system through us or through another party, is a key differentiator between us and our competitors.

We continue to expand our offerings to include additional sustainable home products to our agreements, including non-solar financing. Specifically, we have expanded our offerings to include a non-solar loan program enabling customers to finance the purchase of products independent of a solar energy system or energy storage system. We believe the quality and scope of our expanding sustainable home product offerings, whether to customers that obtained their solar energy system or energy storage system through us or through a third party, is a key differentiator between us and our competitors.

We also enter into leases with third-party owners of pools of solar energy systems to receive such third party's interest in those systems. In connection therewith, we assume the related customer PPA and lease obligations, entitling us to future customer cash flows as well as certain credits, rebates and incentives (including SRECs) under those agreements, in exchange for a lease payment, whether upfront or over time, to the third-party owner, which may be made in the form of cash or shares of our common stock. We believe such arrangements enhance our long-term contracted cash flows and are complementary to our overall business model.

We commenced operations in January 2013 and began providing solar energy services under our first solar energy system in April 2013. Since then, our brand, innovation and focused execution have driven significant, rapid growth in our market share and in the number of customers on our platform. We operate one of the largest residential fleets of solar energy systems in the U.S., comprising more than 2,292 megawatts of generation capacity and our diversified offerings of sustainable home solutions serve over 419,000 customers as of December 31, 2023.

Recent Developments

Financing Transactions

In December 2023, we admitted three tax equity investors with a total capital commitment of approximately $463.0 million. In February 2024, we admitted a tax equity investor with a total capital commitment of approximately $195.0 million and a tax equity investor increased its capital commitment from approximately $59.0 million to approximately $61.4 million. See "*—Liquidity and Capital Resources—Financing Arrangements—Tax Equity Fund Commitments*" below.

In October 2023, we amended the revolving credit facility by and among Sunnova EZ-Own Portfolio, LLC ("EZOP"), certain of our other subsidiaries party thereto, Atlas Securitized Products Holdings, L.P., as administrative agent, and the lenders and other financial institutions party thereto, to, among other things, reallocate commitments among the lenders. In February 2024, we amended the EZOP revolving credit facility to, among other things, (a) reflect certain assignments of commitments occurring within the Atlas Lender Group (as defined by such revolving credit facility) without increasing the existing commitments, and the assignment of the role of the Atlas funding agent for the Atlas Lender Group, (b) amend the thresholds for certain "Amortization Events" (as defined by such revolving credit facility) and (c) modify the "Liquidity Reserve Account Required Balance" (as defined by such revolving credit facility).

In November 2023, we amended and restated the revolving credit facility by and among Sunnova TEP Holdings, LLC ("TEPH"), certain of our other subsidiaries party thereto, Atlas Securitized Products Holdings, L.P., as administrative agent, and the lenders and other financial institutions party thereto, to, among other things, (a) increase the aggregate commitment amount from $769.3 million to $1.309 billion and (b) increase the uncommitted maximum facility amount from $859.0 million to $1.575 billion. In December 2023, an additional lender joined the TEPH revolving credit facility and the aggregate commitment amount was increased from $1.309 billion to $1.311 billion. In February 2024, we amended the TEPH revolving credit facility to, among other things, reflect an assignment of commitments occurring within the Atlas Lender Group (as defined by such revolving credit facility) without increasing the existing commitments and the appointment of a new Atlas funding agent for the Atlas Lender Group.

In December 2023, we entered into a revolving credit facility by and among Sunnova Business Markets Borrower, LLC ("BMB"), certain of our other subsidiaries party thereto, Mitsubishi HC Capital America, Inc., as administrative agent, and the lenders party thereto from time to time, for an aggregate principal amount of up to $25.0 million. The proceeds of the loans under the BMB revolving credit facility are available to, among other things, finance project costs related to commercial, industrial and other solar energy systems and energy storage systems owned by BMB or one of its subsidiaries or by a customer (each, a "Project"). The BMB revolving credit facility is also available to finance completed Projects. Borrowings under the BMB revolving credit facility bear interest at an annual rate (which can vary for different Projects) based on Term SOFR plus a specified margin, or in the case of certain term loans for completed Projects, a fixed margin.

In October 2023, one of our subsidiaries issued $219.6 million in aggregate principal amount of Series 2023-GRID1 Class A solar loan-backed notes and $24.4 million in aggregate principal amount of Series 2023-GRID1 Class B solar loan-backed notes (collectively, the "HESI Notes") with a maturity date of December 2050. The HESI Notes bear interest at an annual rate of 5.75% and 8.25% for the Class A and Class B notes, respectively. In February 2024, one of our subsidiaries issued $194.5 million in aggregate principal amount of Series 2024-1 Class A solar asset-backed notes, $16.5 million in aggregate principal amount of Series 2024-1 Class B solar asset-backed notes and $15.0 million in aggregate principal amount of Series 2024-1 Class C solar asset-backed notes (collectively, the "SOLVI Notes") with a maturity date of January 2059. The SOLVI Notes bear interest at an annual rate of 5.65%, 7.00% and 9.00% for the Class A, Class B and Class C notes, respectively. See "—*Liquidity and Capital Resources—Financing Arrangements—Securitizations*" below.

Securitizations

As a source of long-term financing, we securitize qualifying solar energy systems, energy storage systems and related customer agreements into special purpose entities who issue solar asset-backed and solar loan-backed notes to institutional investors. We also securitize the cash flows generated by the membership interests in certain of our indirect, wholly-owned subsidiaries that are the managing member of a tax equity fund that owns a pool of solar energy systems, energy storage systems and related customer agreements that were originated by one of our wholly-owned subsidiaries. The federal government currently provides business investment tax credits under Section 48(a) (the "Section 48(a) ITC") and residential energy credits under Section 25D (the "Section 25D Credit") of the U.S. Internal Revenue Code of 1986, as amended. For projects that begin construction after December 31, 2024, the Section 48(a) ITC will be replaced with investment tax credits under Section 48E(a) (the "Section 48E ITC"). We do not securitize the Section 48(a) ITC incentives, and currently do not plan to securitize any Section 48E ITC incentives, associated with the solar energy systems and energy storage systems as part of these arrangements. However, we may in the future securitize the expected proceeds from the sale of such tax credits. We use the cash flows these solar energy systems and energy storage systems generate to service the monthly, quarterly or semi-annual principal and interest payments on the notes and satisfy the expenses and reserve requirements of the special purpose entities, with any remaining cash distributed to their sole members, who are typically our indirect wholly-owned subsidiaries. In connection with these securitizations, certain of our affiliates receive a fee for managing and servicing the solar energy systems and energy storage systems pursuant to management, servicing, facility administration and asset management agreements. The special purpose entities are also typically required to maintain a liquidity reserve account and a reserve account for equipment replacements and, in certain cases, reserve accounts for financing fund purchase option/withdrawal right exercises or storage system replacement for the benefit of the holders under the applicable series of notes, each of which are funded from initial deposits or cash flows to the levels specified therein. The creditors of these special purpose entities have no recourse to our other assets except as expressly set forth in the terms of the notes. From our inception through December 31, 2023, we have issued $4.7 billion in solar asset-backed and solar loan-backed notes.

Tax Equity Funds

Our ability to offer long-term solar service agreements depends in part on our ability to finance the installation of the solar energy systems and energy storage systems by co-investing with tax equity investors, such as large banks who value the resulting customer receivables and Section 48(a) ITCs or, in the future, Section 48E ITCs, accelerated tax depreciation and other incentives related to the solar energy systems and energy storage systems, primarily through structured investments known as "tax equity". Tax equity investments are generally structured as non-recourse project financings known as "tax equity funds". In the context of distributed generation solar energy, tax equity investors make contributions upfront or in stages based on milestones in exchange for a share of the tax attributes and cash flows emanating from an underlying portfolio of solar energy systems and energy storage systems. In these tax equity funds, the U.S. federal income tax attributes offset taxes that otherwise would have been payable on the investors' other operations. The terms and conditions of each tax equity fund vary significantly by investor and by fund. We continue to negotiate with potential investors to create additional tax equity funds.

In general, our tax equity funds are structured using the "partnership flip" structure. Under partnership flip structures, we and our tax equity investors contribute cash into a partnership. The partnership uses this cash to acquire long-term solar service agreements, solar energy systems and energy storage systems developed by us and sells energy from such solar energy systems and energy storage systems, as applicable, to customers or directly leases the solar energy systems and energy storage systems, as applicable, to customers. We assign these solar service agreements, solar energy systems, energy storage systems and related incentives to our tax equity funds in accordance with the criteria of the specific funds. Upon such assignment and the satisfaction of certain conditions precedent, we are able to draw down on the tax equity fund commitments. The conditions precedent to funding vary across our tax equity funds but generally require that we have entered into a solar service agreement with the customer, the customer meets certain credit criteria, the solar energy system is expected to be eligible for the Section 48(a) ITC or the Section 48E ITC, as applicable, we have a recent appraisal from an independent appraiser establishing the fair market value of the solar energy system and the property is in an approved state or territory. Certain tax equity investors agree to receive a minimum target rate of return, typically on an after-tax basis, which varies by tax equity fund. Prior to receiving a contractual rate of return or a date specified in the contractual arrangements, the tax equity investor receives substantially all of the non-cash value attributable to the solar energy systems and energy storage systems, which includes accelerated depreciation and Section 48(a) ITCs or Section 48E ITCs, as applicable; however, we typically receive a majority of the cash distributions, which are typically paid quarterly. After the tax equity investor receives its contractual rate of return or after a specified date, we receive substantially all of the cash and tax allocations.

We have determined we are the primary beneficiary in these tax equity funds for accounting purposes. Accordingly, we consolidate the assets and liabilities and operating results of these partnerships in our consolidated financial statements. We recognize the tax equity investors' share of the net assets of the tax equity funds as redeemable noncontrolling interests and noncontrolling interests in our consolidated balance sheets. The income or loss allocations reflected in our consolidated statements of operations may create significant volatility in our reported results of operations, including potentially changing net loss attributable to stockholders to net income attributable to stockholders, or vice versa, from quarter to quarter.

We typically have an option to acquire, and our tax equity investors may have an option to withdraw and require us to purchase, all the equity interests our tax equity investor holds in the tax equity funds starting approximately five years after the last solar energy system in the applicable tax equity fund is operational. If we or our tax equity investors exercise this option, we are typically required to pay at least the fair market value of the tax equity investor's equity interest and, in certain cases, a contractual minimum amount. From our inception through December 31, 2023, we have received commitments of approximately $2.7 billion through the use of tax equity funds, of which an aggregate of $2.1 billion has been funded and $439.4 million remains available for use.

Key Financial and Operational Metrics

We regularly review a number of metrics, including the following key operational and financial metrics, to evaluate our business, measure our performance, identify trends affecting our business, formulate our financial projections and make strategic decisions.

Number of Customers. We define number of customers to include every unique premises on which a Sunnova product or Sunnova-financed product is installed or on which Sunnova is obligated to perform services for a counterparty. We track the total number of customers as an indicator of our historical growth and our rate of growth from period to period.

	As of December 31,		
	2023	**2022**	**Change**
Number of customers	419,200	279,400	139,800

Weighted Average Number of Systems. We calculate the weighted average number of systems based on the number of months a customer and any additional service obligation related to a solar energy system is in-service during a given measurement period. The weighted average number of systems reflects the number of systems at the beginning of a period, plus the total number of new systems added in the period adjusted by a factor that accounts for the partial period nature of those new systems. For purposes of this calculation, we assume all new systems added during a month were added in the middle of that month. The number of systems for any end of period will exceed the number of customers, as defined above, for that same end of period as we are also including any additional services and/or contracts a customer or third party executed for the additional work for the same residence or business. We track the weighted average system count in order to accurately reflect the contribution of the appropriate number of systems to key financial metrics over the measurement period.

	Year Ended December 31,		
	2023	**2022**	**2021**
Weighted average number of systems (excluding loan agreements and cash sales)	219,100	168,400	125,100
Weighted average number of systems with loan agreements	120,400	56,500	27,200
Weighted average number of systems with cash sales	9,300	4,000	600
Weighted average number of systems	348,800	228,900	152,900

Adjusted EBITDA. We define Adjusted EBITDA as net income (loss) excluding the impacts of interest expense, income tax (benefit) expense, depreciation and amortization expense, non-cash compensation expense, asset retirement obligation ("ARO") accretion expense, financing deal costs, natural disaster losses and related charges, net, acquisition costs, losses on unenforceable contracts, losses on extinguishment of long-term debt, realized and unrealized gains and losses on fair value instruments and equity securities, amortization of payments to dealers for exclusivity and other bonus arrangements, legal settlements, provision for current expected credit losses, non-cash inventory and other impairments and indemnification payments to tax equity investors and including the impacts of investment tax credit ("ITC") sales.

Adjusted EBITDA is a non-GAAP financial measure we use as a performance measure. We believe investors and securities analysts also use Adjusted EBITDA in evaluating our operating performance. This measurement is not recognized in accordance with accounting principles generally accepted in the United States of America ("GAAP") and should not be viewed as an alternative to GAAP measures of performance. The GAAP measure most directly comparable to Adjusted EBITDA is net income (loss). The presentation of Adjusted EBITDA should not be construed to suggest our future results will be unaffected by non-cash or non-recurring items. In addition, our calculation of Adjusted EBITDA is not necessarily comparable to Adjusted EBITDA as calculated by other companies.

We believe Adjusted EBITDA is useful to management, investors and analysts in providing a measure of core financial performance adjusted to allow for comparisons of results of operations across reporting periods on a consistent basis. These adjustments are intended to exclude items that are not indicative of the ongoing operating performance of the business. Adjusted EBITDA is also used by our management for internal planning purposes, including our consolidated operating budget, and by our board of directors in setting performance-based compensation targets. Adjusted EBITDA should not be considered an alternative to but viewed in conjunction with GAAP results, as we believe it provides a more complete understanding of ongoing business performance and trends than GAAP measures alone. Adjusted EBITDA has limitations as an analytical tool, and you should not consider it in isolation or as a substitute for analysis of our results as reported under GAAP.

	Year Ended December 31,		
	2023	2022	2021
		(in thousands)	
Reconciliation of Net Loss to Adjusted EBITDA:			
Net loss	$ (502,426)	$ (130,276)	$ (147,510)
Interest expense, net	371,937	107,775	116,248
Interest income	(115,872)	(59,799)	(34,228)
Income tax (benefit) expense	(1,023)	3,886	260
Depreciation expense	153,387	108,167	85,600
Amortization expense	29,583	29,224	21,771
EBITDA	(64,414)	58,977	42,141
Non-cash compensation expense	25,535	24,218	17,236
ARO accretion expense	4,905	3,701	2,897
Financing deal costs	1,723	930	1,411
Natural disaster losses and related charges, net	2,831	1,164	—
Acquisition costs	1,224	7,801	6,709
Loss on extinguishment of long-term debt, net	—	—	9,824
Unrealized (gain) loss on fair value instruments and equity securities	188	(29,279)	(21,988)
Amortization of payments to dealers for exclusivity and other bonus arrangements	6,944	4,327	2,968
Legal settlements	1,680	(1,001)	—
Provision for current expected credit losses	35,515	40,160	23,679
Non-cash inventory and other impairments	50,995	5,375	982
Indemnification payments to tax equity investors	(22)	2,737	—
ITC sales	207,425	—	—
Adjusted EBITDA	$ 274,529	$ 119,110	$ 85,859

Interest Income; Principal Proceeds from Customer Notes Receivable, Net of Related Revenue; and Proceeds from Investments in Solar Receivables. Under our loan agreements, the customer obtains financing for the purchase of a solar energy system from us and we agree to operate and maintain the solar energy system throughout the duration of the agreement. Pursuant to the terms of the loan agreement, the customer makes scheduled principal and interest payments to us and has the option to prepay principal at any time in part or in full. Whereas we typically recognize payments from customers under our leases and PPAs as revenue, we recognize payments received from customers under our loan agreements (a) as interest income, to the extent attributable to earned interest on the contract that financed the customer's purchase of the solar energy system; (b) as a reduction of a note receivable on the balance sheet, to the extent attributable to a return of principal (whether scheduled or prepaid) on the contract that financed the customer's purchase of the solar energy system; and (c) as revenue, to the extent attributable to payments for operations and maintenance services provided by us. Interest income also includes income on short term investments with financial institutions. We also enter into leases with third-party owners of pools of solar energy systems to receive such third party's interest in those systems. In connection therewith, we assume the related customer PPA and lease obligations, entitling us to future customer cash flows as well as certain credits, rebates and incentives (including SRECs) under those agreements. We recognize payments received from such third parties as proceeds from investments in solar receivables.

While Adjusted EBITDA effectively captures the operating performance of our leases and PPAs, it only reflects the service portion of the operating performance under our loan agreements. We do not consider our types of customer agreements differently when evaluating our operating performance. In order to present a measure of operating performance that provides comparability without regard to the different accounting treatment among our different types of customer agreements, we consider interest income, principal proceeds from customer notes receivable, net of related revenue, and proceeds from investments in solar receivables as key performance metrics. We believe these metrics provide a more meaningful and uniform method of analyzing our operating performance when viewed in light of our other key performance metrics across the primary types of customer agreements.

	Year Ended December 31,		
	2023	2022	2021
		(in thousands)	
Interest income	$ 115,872	$ 59,799	$ 34,228
Principal proceeds from customer notes receivable, net of related revenue	$ 146,701	$ 91,455	$ 59,274
Proceeds from investments in solar receivables	$ 11,582	$ 12,394	$ 3,231

Adjusted Operating Expense. We define Adjusted Operating Expense as total operating expense less depreciation and amortization expense, financing deal costs, natural disaster losses and related charges, net, amortization of payments to dealers for exclusivity and other bonus arrangements, legal settlements, direct sales costs, cost of revenue related to cash sales, cost of revenue related to inventory sales, unrealized gains and losses on fair value instruments, gains and losses on held-for-sale loans and excluding the effect of certain non-recurring items we do not consider to be indicative of our ongoing operating performance such as, but not limited to, acquisition costs, losses on unenforceable contracts, indemnification payments to tax equity investors and other non-cash items such as non-cash compensation expense, ARO accretion expense, provision for current expected credit losses and non-cash inventory and other impairments. Adjusted Operating Expense is a non-GAAP financial measure we use as a performance measure. We believe investors and securities analysts will also use Adjusted Operating Expense in evaluating our performance. This measurement is not recognized in accordance with GAAP and should not be viewed as an alternative to GAAP measures of performance. The GAAP measure most directly comparable to Adjusted Operating Expense is total operating expense, net. We believe Adjusted Operating Expense is a supplemental financial measure useful to management, analysts, investors, lenders and rating agencies as an indicator of the efficiency of our operations between reporting periods. Adjusted Operating Expense should not be considered an alternative to but viewed in conjunction with GAAP total operating expense, net, as we believe it provides a more complete understanding of our performance than GAAP measures alone. Adjusted Operating Expense has limitations as an analytical tool and you should not consider it in isolation or as a substitute for analysis of our results as reported under GAAP, including total operating expense.

We use per system metrics, including Adjusted Operating Expense per weighted average system, as an additional way to evaluate our performance. Specifically, we consider the change in this metric from period to period as a way to evaluate our performance in the context of changes we experience in the overall customer base. While the Adjusted Operating Expense figure provides a valuable indicator of our overall performance, evaluating this metric on a per system basis allows for further nuanced understanding by management, investors and analysts of the financial impact of each additional system.

	Year Ended December 31,		
	2023	2022	2021
	(in thousands, except per system data)		
Reconciliation of Total Operating Expense, Net to Adjusted Operating Expense:			
Total operating expense, net	$ 964,088	$ 639,194	$ 296,642
Depreciation expense	(153,387)	(108,167)	(85,600)
Amortization expense	(29,583)	(29,224)	(21,771)
Non-cash compensation expense	(25,535)	(24,218)	(17,236)
ARO accretion expense	(4,905)	(3,701)	(2,897)
Financing deal costs	(1,723)	(930)	(1,411)
Natural disaster losses and related charges, net	(2,831)	(1,164)	—
Acquisition costs	(1,224)	(7,801)	(6,709)
Amortization of payments to dealers for exclusivity and other bonus arrangements	(6,944)	(4,327)	(2,968)
Legal settlements	(1,680)	1,001	—
Provision for current expected credit losses	(35,515)	(40,160)	(23,679)
Non-cash inventory and other impairments	(50,995)	(5,375)	(982)
Direct sales costs	(48,049)	(6,262)	(733)
Cost of revenue related to cash sales	(52,644)	(38,766)	(14,525)
Cost of revenue related to inventory sales	(176,371)	(178,310)	—
Unrealized gain on fair value instruments	3,761	26,189	22,504
Indemnification payments to tax equity investors	22	(2,737)	—
Gain on held-for-sale loans	19	—	—
Adjusted Operating Expense	$ 376,504	$ 215,242	$ 140,635
Adjusted Operating Expense per weighted average system	$ 1,079	$ 940	$ 920

Estimated Gross Contracted Customer Value. We calculate estimated gross contracted customer value as defined below. We believe estimated gross contracted customer value can serve as a useful tool for investors and analysts in comparing the remaining value of our customer contracts to that of our peers.

Estimated gross contracted customer value as of a specific measurement date represents the sum of the present value of the remaining estimated future net cash flows we expect to receive from existing customers during the initial contract term of our customer agreements, which are typically 25 years in length, plus the present value of future net cash flows we expect to receive from the sale of related SRECs, either under existing contracts or in future sales, plus the cash flows we expect to receive from energy services programs such as grid services, plus the carrying value of outstanding customer loans on our balance sheet. From these aggregate estimated initial cash flows, we subtract the present value of estimated net cash distributions to redeemable noncontrolling interests and noncontrolling interests and estimated operating, maintenance and administrative expenses associated with the customer agreements. These estimated future cash flows reflect the projected monthly customer payments over the life of our customer agreements and depend on various factors including but not limited to agreement type, contracted rates, expected sun hours and the projected production capacity of the solar equipment installed. For the purpose of calculating this metric, we discount all future cash flows at 6%.

The anticipated operating, maintenance and administrative expenses included in the calculation of estimated gross contracted customer value include, among other things, expenses related to accounting, reporting, audit, insurance, maintenance and repairs. In the aggregate, we estimate these expenses are $20 per kilowatt per year initially, with 2% annual increases for inflation, and an additional $81 per year non-escalating expense included for energy storage systems. We do not include maintenance and repair costs for inverters and similar equipment as those are largely covered by the applicable product and dealer warranties for the life of the product, but we do include additional cost for energy storage systems, which are only covered by a 10-year warranty. Expected distributions to tax equity investors vary among the different tax equity funds and are based on individual tax equity fund contract provisions.

Estimated gross contracted customer value is forecasted as of a specific date. It is forward-looking and we use judgment in developing the assumptions used to calculate it. Factors that could impact estimated gross contracted customer value include, but are not limited to, customer payment defaults, or declines in utility rates or early termination of a contract in certain circumstances, including prior to installation. The following table presents the calculation of estimated gross contracted customer value as of December 31, 2023 and 2022, calculated using a 6% discount rate.

	As of December 31,	
	2023	2022
	(in millions)	
Estimated gross contracted customer value	$ 9,097	$ 5,875

Sensitivity Analysis. The calculation of estimated gross contracted customer value and associated operational metrics requires us to make a number of assumptions regarding future revenues and costs that may not prove accurate. Accordingly, we present below a sensitivity analysis with a range of assumptions. We consider a discount rate of 6% to be appropriate based on recent transactions that demonstrate a portfolio of customer agreements is an asset class that can be securitized successfully on a long-term basis with a weighted-average coupon of less than 6%. We also present these metrics with a discount rate of 6% based on industry practice. The appropriate discount rate for these estimates may change in the future due to the level of inflation, rising interest rates, our cost of capital and consumer demand for solar energy systems. In addition, the table below provides a range of estimated gross contracted customer value amounts if different cumulative customer loss rate assumptions were used. We are presenting this information for illustrative purposes only and as a comparison to information published by our peers.

Estimated Gross Contracted Customer Value

	As of December 31, 2023				
	Discount rate				
Cumulative customer loss rate	4%	5%	6%	7%	8%
	(in millions)				
5%	$ 9,665	$ 9,215	$ 8,821	$ 8,476	$ 8,172
0%	$ 10,032	$ 9,532	$ 9,097	$ 8,716	$ 8,382

Significant Factors and Trends Affecting Our Business

Our results of operations and our ability to grow our business over time could be impacted by a number of factors and trends that affect our industry generally, as well as new offerings of services and products we may acquire or seek to acquire in the future. Additionally, our business is concentrated in certain markets, putting us at risk of region-specific disruptions such as adverse economic, regulatory, political, weather and other conditions. See "*Item 1A. Risk Factors*" for further discussion of risks affecting our business.

Financing Availability. Our future growth and profitability depends, in significant part, on our ability to raise capital from third-party investors on competitive terms to help finance the origination of our solar energy systems under our solar service agreements. We have historically used debt, such as convertible senior notes, senior notes, asset-backed and loan-backed securitizations and warehouse facilities, tax equity, preferred equity, common equity and other financing strategies to help fund our operations. With respect to tax equity, there are a limited number of potential tax equity investors, and the competition for this investment capital is intense. The principal tax credit on which tax equity investors in our industry rely is the Section 48(a) ITC. Prior to the Inflation Reduction Act of 2022 ("IRA"), which was enacted in August 2022, the amount for the Section 48(a) ITC was equal to (a) 30% of the basis of eligible solar property that began construction before 2020 or (b) 26% of the basis of eligible solar property that began construction during 2020, 2021 or 2022. Under the IRA, the Section 48(a) ITC is (a) 26% for eligible solar property that began construction after 2019 and was placed in service before 2022 and (b) 30% for eligible solar property or eligible energy storage property that begins construction before 2025 provided (i) the project satisfies certain labor and apprenticeship requirements, (ii) the project has a maximum net output of less than one megawatt (as measured in alternating current) or (iii) the project began construction prior to January 29, 2023. If no criterion is satisfied, the base amount of the Section 48(a) ITC will be equal to 6%. In addition, the Section 48(a) ITC will be replaced by the Section 48E ITC for eligible solar energy property or eligible energy storage property that begins construction after 2024, and the Section 48E ITC percentage will be the same as the percentage for the Section 48(a) ITC and subject to the same requirements in order to receive the full benefit. The Section 48E ITC percentage will begin to phase down for projects that begin construction after (a) 2033 or (b) if later, the first year after the year in which the U.S. Department of Treasury determines greenhouse gas emissions from the production of electricity in the United States are no more than 25% of 2022 levels. We believe our solar energy systems and energy storage systems generally will not be subject to the labor and apprenticeship requirements of the IRA due to the maximum net output of most of our solar energy systems and energy storage systems. However, solar energy systems and energy storage systems financed by Hestia securitizations will be subject to applicable labor and other requirements imposed by the DOE and the U.S. Department of Labor. In addition, the IRA added a new provision that allows taxpayers to transfer certain federal income tax credits that arise after 2022, such as the Section 48(a) ITC, to third parties for cash. In September 2023, we entered into our first tax credit purchase and sale agreements and subsequently entered into another tax credit purchase and sale agreement in December 2023. It is unclear what long-term effect the ability to transfer Section 48(a) ITCs will have on tax equity structures, although we expect the market for tax equity structures to continue for investors who will continue to value benefits that are not transferable, such as accelerated depreciation. We are continuing to evaluate the overall impact and applicability of the IRA to our ability to raise capital from third-party investors.

Our ability to raise capital from third-party investors is also affected by general economic conditions, the state of the capital markets, inflation levels and concerns about our industry or business. Specifically, interest rates have risen over the past few years and remain subject to volatility that may result from action taken by the Federal Reserve.

Cost of Solar Energy Systems and Energy Storage Systems. Although we have experienced a prolonged period of component cost declines, upward pressure on prices of solar energy systems and energy storage systems may still occur due to growth in the solar industry, regulatory policy changes, tariffs and duties or inflationary cost pressures. As a result of these developments, we may pay higher prices on solar modules and other cost components, which may make it less economical for us to serve certain markets. While lower costs of components may benefit our growth and profitability, downward pressure on prices of solar energy systems and energy storage systems may lead to impairment of our inventory.

Energy Storage Systems. Our energy storage systems increase our customers' independence from the centralized utility and provide on-site backup power when there is a grid outage due to storms, wildfires, other natural disasters and general power failures caused by supply or transmission issues. In addition, at times it can be more economic to consume less energy from the grid or, alternatively, to export solar energy back to the grid. Recent technological advancements for energy storage systems allow the energy storage system to adapt to pricing and utility rate shifts by controlling the inflows and outflows of power, allowing customers to increase the value of their solar energy system plus energy storage system. The energy storage system charges during the day, making the energy it stores available to the home or business when needed. It also features software that can customize power usage for the individual customer, providing backup power, optimizing solar energy consumption versus grid consumption or preventing export to the grid as appropriate. The software is tailored based on utility regulation, economic indicators and grid conditions. The combination of energy control, increased energy resilience and independence from the grid is strong incentive for customers to adopt solar and energy storage. Attachment rates for energy storage systems have trended higher while the price to acquire has trended lower making the addition of energy storage systems a potential area of growth and profitability for us. As energy storage systems and their related software features become more advanced, we expect to see increased adoption of energy storage systems.

Climate Change Action. As a result of increasing global awareness of and aversion to climate change impacts, we believe the renewable energy market in which we operate, and investment in climate solutions more broadly, will continue to grow as the impact of climate change increases. This trend, along with increasing commitments to reduce carbon emissions, is expected to result in increased demand for our products and services. Under the current presidential administration, the focus on cleaner energy sources and technology to decarbonize the U.S. economy continues to accelerate. The federal government's administration under President Joe Biden ("Biden administration") has taken immediate steps that we believe signify support for cleaner energy sources, including, but not limited to, rejoining the Paris Climate Accord, re-establishing a social price on carbon used in cost/benefit analysis for policy making and announcing a commitment to transition the U.S. economy to a net-zero carbon economy by 2050. We expect the Biden administration, combined with a closely divided Congress, to continue to take actions that are supportive of the renewable energy industry, such as incentivizing clean energy sources and supporting new investment in areas like renewables. There is no guarantee a new administration or a change in the makeup of Congress would continue to take supportive actions, and such a changed administration may make decisions and/or pass laws that are detrimental to our industry.

Government Regulations, Policies and Incentives. Our growth and operations strategy depends in significant part on government policies and incentives that promote and support solar energy and enhance the economic viability of distributed solar. These policies and incentives come in various forms, including net metering, eligibility for accelerated depreciation such as the modified accelerated cost recovery system, SRECs, tax abatements, rebates, renewable targets, DOE loan guarantee programs, incentive programs and tax credits, particularly the Section 48(a) ITC and the Section 25D Credit. The IRA expanded and extended the tax credits available to solar energy projects in an effort to achieve the Biden administration's non-binding target of net-zero emissions by 2050, which we expect will increase demand for our services. The Section 25D Credit allows qualifying homeowners to deduct up to 30% of the cost of installing residential solar energy systems from their U.S.

federal income taxes, thereby returning a significant portion of the purchase price of the residential solar energy system to homeowners that may participate in our solar loan programs. Under the terms of the current extension, the residential tax credit will remain at 30% through the end of 2032, reduce to 26% for 2033, reduce to 22% for 2034, and further reduce to 0% after the end of 2034 for residential solar energy systems, unless it is extended before that time. The IRA also extended the investment tax credit for solar energy projects through at least 2033 and, depending on the location of a particular project, its size, its ability to satisfy certain labor and domestic content requirements and the category of consumers it serves, the investment tax credit percentage can range between 6% and 70%. Policies requiring solar on new roofs, such as those enacted in California and New York City, also support the growth of distributed solar. The sale of SRECs has constituted a significant portion of our revenue historically. A change in the value of net metering credits or SRECs or changes in other policies or a loss or reduction in such incentives could decrease the attractiveness of distributed solar to us, our dealers and our customers in applicable markets, which could reduce our customer acquisition opportunities. Such a loss or reduction could also reduce our willingness to pursue certain customer acquisitions due to decreased revenue or income under our customer agreements. Additionally, such a loss or reduction may also impact the terms of and availability of third-party financing. If any of these government regulations, policies or incentives are adversely amended, delayed, eliminated, reduced, retroactively changed or not extended beyond their current expiration dates or there is a negative impact from the recent federal law changes or proposals, our operating results and the demand for, and the economics of, distributed solar energy may decline, which could harm our business.

Components of Results of Operations

Revenue. We recognize revenue from contracts with customers as we satisfy our performance obligations at a transaction price reflecting an amount of consideration based upon an estimated rate of return, net of cash incentives. We express this rate of return as the solar rate per kWh in the customer contract. The amount of revenue we recognize does not equal customer cash payments because we satisfy performance obligations ahead of cash receipt or evenly as we provide continuous access on a stand-ready basis to the solar energy system. We reflect the differences between revenue recognition and cash payments received in accounts receivable, other assets or deferred revenue, as appropriate.

PPAs. We have determined solar service agreements under which customers purchase electricity from us should be accounted for as revenue from contracts with customers. We recognize revenue based upon the amount of electricity delivered as determined by remote monitoring equipment at solar rates specified under the contracts. The PPAs generally have a term of 20 or 25 years with an opportunity for customers to renew for up to an additional 10 years, via two five-year or one 10-year renewal options.

Lease Agreements. We are the lessor under lease agreements for solar energy systems and energy storage systems, which we account for as revenue from contracts with customers. We recognize revenue on a straight-line basis over the contract term as we satisfy our obligation to provide continuous access to the solar energy system. The lease agreements generally have a term of 20 or 25 years with an opportunity for customers to renew for up to an additional 10 years, via two five-year or one 10-year renewal options.

We provide customers under our lease agreements a performance guarantee that each solar energy system will achieve a certain specified minimum solar energy production output. The specified minimum solar energy production output may not be achieved due to natural fluctuations in the weather or equipment failures from exposure and wear and tear outside of our control, among other factors. We determine the amount of guaranteed output based on a number of different factors, including (a) the specific site information related to the tilt of the panels, azimuth (a horizontal angle measured clockwise in degrees from a reference direction) of the panels, size of the solar energy system and shading on site; (b) the calculated amount of available irradiance (amount of energy for a given flat surface facing a specific direction) based on historical average weather data and (c) the calculated amount of energy output of the solar energy system.

If the solar energy system does not produce the guaranteed production amount, we are required to provide a bill credit or refund a portion of the previously remitted customer payments, where the bill credit or repayment is calculated as the product of (a) the shortfall production amount and (b) the dollar amount (guaranteed rate) per kWh that is fixed throughout the term of the contract. These bill credits or remittances of a customer's payments, if needed, are payable in January following the end of the first three years of the solar energy system's placed in service date and then every annual period thereafter. See Note 17, Commitments and Contingencies, to our consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

Inventory Sales. Inventory sales revenue represents revenue from the direct sale of inventory to our dealers or other parties. We recognize the related revenue under ASC 606 upon shipment or upon sale when a bill and hold agreement is in place.

Service Revenue. Service revenue includes sales of service plans and repair services. Service plans are available to customers whose solar energy system was not originally sold by Sunnova. We recognize revenue from service plan contracts on a straight-line basis over the life of the contract, which is typically 10 years. We recognize revenue from repair services in the period in which the service was performed.

Direct Sales Revenue. Direct sales revenue includes revenue from the direct sale of solar energy systems and energy storage systems to customers with financing provided by us. We recognize revenue from the direct sale of solar energy systems and energy storage systems in the period in which the systems are placed in service.

SRECs. Each SREC represents the environmental benefit of one megawatt hour (1,000 kWh) generated by a solar energy system. We sell SRECs to utilities and other third parties who use the SRECs to meet renewable portfolio standards and can do so separate from the actual electricity generated by the renewable-based generation source. We account for SRECs generated from solar energy systems owned by us, as opposed to those owned by our customers, as governmental incentives with no costs incurred to obtain them and do not consider those SRECs output of the underlying solar energy systems. We classify SRECs as inventory held until sold and delivered to third parties. We enter into economic hedges with major financial institutions related to expected production of SRECs through forward contracts to partially mitigate the risk of decreases in SREC market rates. While these fixed price forward contracts serve as an economic hedge against spot price fluctuations for the SRECs, the contracts do not qualify for hedge accounting and are not designated as cash flow hedges or fair value hedges. The contracts require us to physically deliver the SRECs upon settlement. We recognize the related revenue upon the transfer of the SRECs to the counterparty. The costs related to the sales of SRECs are generally limited to fees for brokered transactions. Accordingly, the sale of SRECs in a period generally has a favorable impact on our operating results for that period. In certain circumstances we are required to purchase SRECs on the open market to fulfill minimum delivery requirements under our forward contracts.

Cash Sales. Cash sales revenue represents revenue from a customer's purchase of a solar energy system from us typically when purchasing a new home. We recognize the related revenue upon verification of the home closing.

Loan Agreements. We recognize payments received from customers under loan agreements (a) as interest income, to the extent attributable to earned interest on the contract that financed the customer's purchase; (b) as a reduction of a note receivable on the balance sheet, to the extent attributable to a return of principal (whether scheduled or prepaid) on the contract that financed the customer's purchase; and (c) as revenue, to the extent attributable to payments for operations and maintenance services provided by us. Similar to our lease agreements, we provide customers under our loan agreements a performance guarantee that each solar energy system will achieve a certain specified minimum solar energy production output, which is a significant proportion of its expected output.

Other Revenue. Other revenue includes certain state and utility incentives. We recognize revenue from state and utility incentives in the periods in which they are earned.

Cost of Revenue—Depreciation. Cost of revenue—depreciation represents depreciation on solar energy systems under lease agreements and PPAs that have been placed in service.

Cost of Revenue—Inventory Sales. Cost of revenue—inventory sales represents costs related to the procurement and direct sale of inventory to our dealers or other parties, including shipping and handling costs.

Cost of Revenue—Other. Cost of revenue—other represents costs related to cash sales, costs to purchase SRECs on the open market, SREC broker fees, payroll and related costs for Sunnova personnel who install solar energy systems and energy storage systems and other items deemed to be a cost of providing the service of selling power to customers or potential customers, such as certain costs to service loan agreements, costs for filing under the Uniform Commercial Code to maintain title, title searches, credit checks on potential customers at the time of initial contract and other similar costs, typically directly related to the volume of customers and potential customers.

Operations and Maintenance Expense. Operations and maintenance expense represents costs from third parties for maintaining and servicing the solar energy systems, property insurance, property taxes and warranties. When services for maintaining and servicing solar energy systems are provided by Sunnova personnel rather than third parties, those amounts are included in payroll costs classified within general and administrative expense. During the years ended December 31, 2023, 2022 and 2021, we incurred $49.9 million, $21.2 million and $14.3 million, respectively, of Sunnova personnel costs related to maintaining and servicing solar energy systems, which are classified in general and administrative expense. In addition, operations and maintenance expense includes write downs and write-offs related to inventory adjustments, gains and losses on disposals and other impairments and impairments and costs due to natural disaster losses net of insurance proceeds recovered under our business interruption and property damage insurance coverage for natural disasters.

General and Administrative Expense. General and administrative expense represents costs for our employees, such as salaries, bonuses, benefits and all other employee-related costs, including stock-based compensation, professional fees related to legal, accounting, human resources, finance and training, information technology and software services, marketing and communications, acquisition costs, travel and rent and other office-related expenses. General and administrative expense also includes depreciation on assets not classified as solar energy systems, including information technology software and development projects, vehicles, furniture, fixtures, computer equipment and leasehold improvements and accretion expense on AROs. We capitalize a portion of general and administrative costs, such as payroll-related costs, that is related to employees who are directly involved in the design, construction, installation and testing of the solar energy systems but not directly associated with a particular asset. We also capitalize a portion of general and administrative costs, such as payroll-related costs, that is related to employees who are directly associated with and devote time to internal information technology software and development projects, to the extent of the time spent directly on the application and development stage of such software project.

Goodwill Impairment. Goodwill impairment represents impairment charges as a result of the carrying amount being greater than the fair value.

Other Operating Income. Other operating income primarily represents changes in the fair values of certain financial instruments related to our investments in solar receivables and contingent consideration related to the installation and microgrid earnouts.

Interest Expense, Net. Interest expense, net represents interest on our borrowings under our various debt facilities, amortization of debt discounts and deferred financing costs and realized and unrealized gains and losses on derivative instruments.

Interest Income. Interest income represents interest income from the notes receivable under our loan program and income on short term investments with financial institutions.

Other (Income Expense. Other (income) expense primarily represents changes in the fair value of certain financial instruments related to non-operating assets.

Income Tax (Benefit Expense. We account for income taxes under Accounting Standards Codification 740, *Income Taxes*. As such, we determine deferred tax assets and liabilities based on temporary differences resulting from the different treatment of items for tax and financial reporting purposes. We measure deferred tax assets and liabilities using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to reverse. Additionally, we must assess the likelihood that deferred tax assets will be recovered as deductions from future taxable income. We evaluate the recoverability of our deferred tax assets on a quarterly basis. The income tax (benefit) expense includes the effects of taxes incurred in U.S. territories where the tax code for the respective territory may have separate tax reporting requirements, as applicable. We account for ITCs using the flow-through method. For tax credit purchase and sale agreements entered into by certain of our consolidated tax equity partnerships, we record our share of the sale as income tax benefit and the tax equity investor's share as an increase to redeemable noncontrolling interest or noncontrolling interest.

Net Income (Loss Attributable to Redeemable Noncontrolling Interests and Noncontrolling Interests. Net income (loss) attributable to redeemable noncontrolling interests and noncontrolling interests represents tax equity interests in the net income or loss of certain consolidated subsidiaries based on hypothetical liquidation at book value.

Results of Operations—Year Ended December 31, 2023 Compared to Year Ended December 31, 2022

The following table sets forth our consolidated statements of operations data for the periods indicated.

	Year Ended December 31, 2023	Year Ended December 31, 2022	Change
	(in thousands)		
Revenue	$ 720,653	$ 557,690	$ 162,963
Operating expense:			
Cost of revenue—depreciation	130,261	96,280	33,981
Cost of revenue—inventory sales	176,371	178,310	(1,939)
Cost of revenue—other	120,865	52,487	68,378
Operations and maintenance	96,997	36,679	60,318
General and administrative	430,422	302,004	128,418
Goodwill impairment	13,150	—	13,150
Other operating income	(3,978)	(26,566)	22,588
Total operating expense, net	964,088	639,194	324,894
Operating loss	(243,435)	(81,504)	(161,931)
Interest expense, net	371,937	107,775	264,162
Interest income	(115,872)	(59,799)	(56,073)
Other (income) expense	3,949	(3,090)	7,039
Loss before income tax	(503,449)	(126,390)	(377,059)
Income tax (benefit) expense	(1,023)	3,886	(4,909)
Net loss	(502,426)	(130,276)	(372,150)
Net income (loss) attributable to redeemable noncontrolling interests and noncontrolling interests	(84,465)	31,366	(115,831)
Net loss attributable to stockholders	$ (417,961)	$ (161,642)	$ (256,319)

Revenue

	Year Ended December 31, 2023	Year Ended December 31, 2022	Change
	(in thousands)		
PPA revenue	$ 123,646	$ 104,563	$ 19,083
Lease revenue	147,788	100,070	47,718
Inventory sales revenue	185,855	195,979	(10,124)
Service revenue	16,197	4,178	12,019
Direct sales revenue	60,590	8,484	52,106
SREC revenue	50,375	48,698	1,677
Cash sales revenue	96,072	72,425	23,647
Loan revenue	34,716	18,601	16,115
Other revenue	5,414	4,692	722
Total	$ 720,653	$ 557,690	$ 162,963

Revenue increased by $163.0 million in the year ended December 31, 2023 compared to the year ended December 31, 2022 primarily due to an increased number of solar energy systems in service. The weighted average number of systems (excluding systems with loan agreements, service-only agreements and cash sales) increased from approximately 128,300 for the year ended December 31, 2022 to approximately 168,500 for the year ended December 31, 2023. Excluding SREC revenue, revenue under our loan agreements, inventory sales revenue, cash sales revenue, direct sales revenue and service revenue, on a weighted average number of systems basis, revenue remained relatively flat at $1,632 per system for the year ended December 31, 2022 compared to $1,643 per system for the same period in 2023 (1% increase). Inventory sales revenue decreased by $10.1 million in the year ended December 31, 2023 compared to the year ended December 31, 2022 due to our dealers having sufficient inventory on hand from prior purchases. Service revenue increased by $12.0 million in the year ended December 31, 2023 compared to the year ended December 31, 2022 primarily due to an increase in repair service revenue. Direct sales revenue increased by $52.1 million in the year ended December 31, 2023 compared to the year ended December 31, 2022 due to an increased focus on direct sales of additional services to existing customers. On a weighted average number of systems basis, revenues under our loan agreements (excluding accessory loans, which do not generate revenue) increased from $345 per system for the year ended December 31, 2022 to $405 per system for the same period in 2023 (17% increase) primarily due to an increase in the fees charged for operations and maintenance services.

Cost of Revenue—Depreciation

	Year Ended December 31, 2023	Year Ended December 31, 2022	Change
	(in thousands)		
Cost of revenue—depreciation	$ 130,261	$ 96,280	$ 33,981

Cost of revenue—depreciation increased by $34.0 million in the year ended December 31, 2023 compared to the year ended December 31, 2022. This increase was primarily due to an increase in the weighted average number of systems (excluding systems with loan agreements, service-only agreements and cash sales) from approximately 128,300 for the year ended December 31, 2022 to approximately 168,500 for the year ended December 31, 2023. On a weighted average number of systems basis, cost of revenue—depreciation remained relatively flat at $750 per system for the year ended December 31, 2022 compared to $773 per system for the same period in 2023 (3% increase).

Cost of Revenue—Inventory Sales

	Year Ended December 31, 2023	Year Ended December 31, 2022	Change
	(in thousands)		
Cost of revenue—inventory sales	$ 176,371	$ 178,310	$ (1,939)

Cost of revenue—inventory sales decreased by $1.9 million in the year ended December 31, 2023 compared to the year ended December 31, 2022. This decrease was due to our dealers having sufficient inventory on hand from prior purchases.

Cost of Revenue—Other

	Year Ended December 31, 2023	Year Ended December 31, 2022	Change
	(in thousands)		
Cost of revenue—other	$ 120,865	$ 52,487	$ 68,378

Cost of revenue—other increased by $68.4 million in the year ended December 31, 2023 compared to the year ended December 31, 2022. This increase was primarily due to costs related to direct sales revenue of $41.8 million, costs related to cash sales revenue of $13.9 million and costs related to services of $9.1 million.

Operations and Maintenance Expense

	Year Ended December 31,		
	2023	2022	Change
		(in thousands)	
Operations and maintenance	$ 96,997	$ 36,679	$ 60,318

Operations and maintenance expense increased by $60.3 million in the year ended December 31, 2023 compared to the year ended December 31, 2022 primarily due to higher impairments and losses on disposals, truck roll costs and property insurance costs. Operations and maintenance expense per weighted average system, excluding net natural disaster losses and non-cash inventory and other impairments, increased from $178 per system for the year ended December 31, 2022 to $251 per system for the year ended December 31, 2023 primarily due to higher truck roll costs and property insurance costs.

General and Administrative Expense

	Year Ended December 31,		
	2023	2022	Change
		(in thousands)	
General and administrative	$ 430,422	$ 302,004	$ 128,418

General and administrative expense increased by $128.4 million in the year ended December 31, 2023 compared to the year ended December 31, 2022 primarily due to increases in (a) payroll and employee related expenses primarily due to the hiring of personnel to support growth of $74.3 million, (b) consultants, contractors and professional fees of $11.2 million, (c) depreciation expense of $11.2 million, (d) information technology expense of $10.7 million, (e) legal expense of $7.2 million, (f) marketing expense of $5.9 million and (g) fees of $2.1 million.

Goodwill Impairment

Goodwill impairment increased by $13.2 million in the year ended December 31, 2023 compared to the year ended December 31, 2022 due to the write off of $13.2 million of goodwill in 2023 as the carrying amount exceeded the fair value.

Other Operating Income

	Year Ended December 31,		
	2023	2022	Change
		(in thousands)	
Other operating income	$ (3,978)	$ (26,566)	$ 22,588

Other operating income decreased by $22.6 million in the year ended December 31, 2023 compared to the year ended December 31, 2022 primarily due to changes in the fair value of certain financial instruments and contingent consideration.

Interest Expense, Net

	Year Ended December 31,		
	2023	2022	Change
		(in thousands)	
Interest expense, net	$ 371,937	$ 107,775	$ 264,162

Interest expense, net increased by $264.2 million in the year ended December 31, 2023 compared to the year ended December 31, 2022. This increase was primarily due to an increase in interest expense of $160.8 million primarily due to higher levels of debt outstanding in 2023 compared to 2022 and an increase in unrealized losses on derivatives of $86.8 million, partially offset by an increase in realized gains on derivatives of $5.4 million.

Interest Income

	Year Ended December 31,		
	2023	2022	Change
		(in thousands)	
Interest income	$ 115,872	$ 59,799	$ 56,073

Interest income increased by $56.1 million in the year ended December 31, 2023 compared to the year ended December 31, 2022. This increase was primarily due to an increase in the weighted average number of systems with loan agreements from approximately 56,500 for the year ended December 31, 2022 to approximately 120,400 for the year ended December 31, 2023. On a weighted average number of systems basis, loan interest income decreased from $999 per system for the year ended December 31, 2022 to $821 per system for the year ended December 31, 2023 primarily due to an increase in the volume of accessory loans, which have smaller principal balances.

Income Tax (Benefit) Expense

Income tax (benefit) expense changed by $4.9 million in the year ended December 31, 2023 compared to the year ended December 31, 2022 primarily due to ITC sales that resulted in an income tax benefit offset by an increase in taxable income related to tax gains recognized on the sale of solar energy systems and energy storage systems located in separate tax-reporting jurisdictions.

Net Income (Loss) Attributable to Redeemable Noncontrolling Interests and Noncontrolling Interests

Net income (loss) attributable to redeemable noncontrolling interests and noncontrolling interests changed by $115.8 million in the year ended December 31, 2023 compared to the year ended December 31, 2022 primarily due to an increase in loss attributable to noncontrolling interests from tax equity funds added in 2021, 2022 and 2023.

Results of Operations—Year Ended December 31, 2022 Compared to Year Ended December 31, 2021

See "*Management's Discussion and Analysis of Financial Condition and Results of Operations—Results of Operations—Year Ended December 31, 2022 Compared to Year Ended December 31, 2021*" in our Annual Report on Form 10-K filed with the SEC on February 23, 2023.

Liquidity and Capital Resources

As of December 31, 2023, we had total cash of $494.4 million, of which $212.8 million was unrestricted, and $733.0 million of available borrowing capacity under our various financing arrangements. We seek to maintain diversified and cost-effective funding sources to finance and maintain our operations, fund capital expenditures, including customer acquisitions, and satisfy obligations arising from our indebtedness, which may include reducing debt prior to scheduled maturities through debt repurchases, either in the open market or in privately negotiated transactions, through debt redemptions or tender offers, or through repayments of bank borrowings. For a discussion of cash requirements from contractual and other obligations, see Note 17, Commitments and Contingencies, to our consolidated financial statements included elsewhere in this Annual Report on Form 10-K. Historically, our primary sources of liquidity have included non-recourse and recourse debt, investor asset-backed and loan-backed securitizations and cash generated from operations. Our business model requires substantial outside financing arrangements to grow the business and facilitate the deployment of additional solar energy systems. We will seek to raise additional required capital, including from new and existing tax equity investors, additional borrowings, securitizations and other potential debt and equity financing sources. We believe our cash and financing arrangements, as further described below, will be sufficient to meet our anticipated cash needs for at least the next twelve months. As of December 31, 2023, we were in compliance with all debt covenants under our financing arrangements.

As of December 31, 2023, our liquidity and financial condition had not been materially affected by the adverse developments affecting financial institutions and companies in the financial services industry, including Silicon Valley Bank and Credit Suisse. For a discussion of the potential impact of these adverse developments, see Item 1A. Risk Factors included elsewhere in this Annual Report on Form 10-K.

Financing Arrangements

The following is a description of our various financing arrangements. For a complete description of the facilities in place as of December 31, 2023 see Note 9, Long-Term Debt, to our consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

Tax Equity Fund Commitments

As of December 31, 2023, we had undrawn committed capital of approximately $439.4 million under our tax equity funds, which may only be used to purchase and install solar energy systems. We intend to establish new tax equity funds in the future depending on their attractiveness, including the availability and size of Section 48(a) ITCs and Section 48E ITCs, and on investor demand for such funding. The terms of the tax equity funds' operating agreements contain allocations of taxable income (loss) and Section 48(a) ITCs that vary over time and adjust between the members after either the tax equity investor receives its contractual rate of return or after a specified date. The following table summarizes our tax equity commitments as of December 31, 2023:

Date Class A Member Admitted	Class A Member Capital Commitment
	(in thousands)
December 2017	$ 45,000
December 2017	$ 57,000
January 2019	$ 50,000
August 2019	$ 75,000
December 2019	$ 50,000
February 2020	$ 75,000
May 2020	$ 155,000
July 2020	$ 10,000
September 2020	$ 75,000
November 2020	$ 100,000
April 2021	$ 50,000
April 2021	$ 25,000
May 2021	$ 150,000
July 2021	$ 150,152
October 2021	$ 11,634
December 2021	$ 57,676
February 2022	$ 150,000
May 2022	$ 17,452
September 2022	$ 75,000
October 2022	$ 30,000
November 2022	$ 51,250
December 2022	$ 59,000
December 2022	$ 125,000
December 2022	$ 250,000
May 2023	$ 51,000
August 2023	$ 103,950
September 2023	$ 134,937
December 2023	$ 59,000
December 2023	$ 300,000
December 2023	$ 103,950

For additional information regarding our tax equity fund commitments, see Note 13, Redeemable Noncontrolling Interests and Noncontrolling Interests, to our consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

Warehouse and Other Debt Financings

We from time to time enter into warehouse credit facilities as a source of funding. Under the warehouse credit facilities, revolving or term financing is provided to special purpose entities, which are typically our wholly-owned subsidiaries, and secured, directly or indirectly, by qualifying solar energy systems, energy storage systems and/or other sustainable home products and the related customer agreements. The cash flows generated by these customer agreements are used to cover required debt service payments under the related credit facility and satisfy the expenses and reserve requirements of the special purpose entities. The warehouse credit facilities allow for the pooling and transfer of eligible solar energy systems, energy storage systems and/or other sustainable home products and related customer agreements, as applicable, on a non-recourse basis to the subsidiary or us, subject to certain limited exceptions. In connection with these warehouse credit facilities, certain of our affiliates receive a fee for managing and servicing the solar energy systems, energy storage systems and/or other sustainable home products, as applicable, pursuant to management and servicing agreements. The special purpose entities are also typically required to maintain reserve accounts, including, among other reserve accounts that may be required, a liquidity reserve account and a reserve account for equipment replacements, each of which are funded from initial deposits or cash flows to the levels specified therein.

The warehouse credit facility structures include certain features designed to protect lenders. One of the common primary features relates to certain events, such as the insufficiency of cash flows in the collateral pool of assets to meet contractual requirements, the occurrence of which triggers an early repayment of the loans and limits the relevant borrower's ability to obtain additional advances or distribute funds to us. We refer to this as an "amortization event", which may be based on, among other things, a debt service coverage ratio falling or remaining below certain levels, default or delinquency levels of solar loans, home improvement loans, solar energy systems and/or energy storage systems, as applicable, exceeding certain thresholds or excess spread falling below certain levels over a multiple month period. In the event of an amortization event, the availability period under a revolving warehouse credit facility may terminate and the borrower may be required to repay the affected outstanding borrowings using available collections received from the asset pool. However, the period of ultimate repayment would be determined by the amount and timing of collections received. An amortization event would impair our liquidity and may require us to utilize our other available contingent liquidity or rely on alternative funding sources, which may or may not be available at the time. The debt agreements of our warehouse credit facilities also typically contain customary events of default for warehouse financings that entitle the lenders to take various actions, including the acceleration of amounts due under the related debt agreement and foreclosure on the borrower's assets.

In April 2017, one of our subsidiaries, EZOP, entered into a secured revolving credit facility with Credit Suisse AG, New York Branch, as agent, and the lenders party thereto. The EZOP revolving credit facility was previously amended in 2019, 2020, 2021 and 2022 and was amended and restated in 2023 as described below. Under the amended EZOP revolving credit facility, EZOP may borrow up to an aggregate committed amount of $875.0 million, with an uncommitted maximum facility amount of $1.0 billion, subject to a borrowing base amount determined at each borrowing and calculated based on the net outstanding principal balance of the eligible solar loans securing the EZOP revolving credit facility multiplied by the weighted average advance rate. The EZOP revolving credit facility has a maturity date occurring in November 2025. The proceeds of the loans under the EZOP revolving credit facility are available for funding the purchase of solar loans and related solar assets, making deposits in EZOP's reserve accounts and paying fees and expenses in connection with the EZOP revolving credit facility. The EZOP revolving credit facility bears interest at an annual rate based on Term SOFR (as defined by such revolving credit facility) plus a margin specific to each lender. Sunnova Energy Corporation guarantees the performance obligations of certain affiliates under agreements entered into in connection with the EZOP revolving credit facility, as well as certain indemnity and refund obligations. In February 2023, we amended the EZOP revolving credit facility to, among other things, (a) increase the aggregate commitment amount from $450.0 million to $675.0 million, (b) increase the uncommitted maximum facility amount from $575.0 million to $800.0 million, (c) amend certain provisions related to the allocation of certain payments made to the lenders, (d) amend certain provisions related to excess concentration limits and eligibility criteria to permit us and our affiliates to provide warranties of, and replacements for, load controllers and generators in connection with the related solar loan contracts and (e) add provisions to allow EZOP to request an increase in the aggregate commitment amount (subject to certain conditions) by adding additional lenders to the EZOP revolving credit facility. In February 2023, Credit Suisse AG ("Credit Suisse") sold a significant part of its Securitized Products Group (the "Credit Suisse Securitized Products Sale") to Apollo Global Management ("Apollo"). Subsequently, Apollo publicly announced the majority of the assets and professionals associated with the sale are now part of or managed by ATLAS SP Partners, a new stand-alone credit firm focused on asset-backed financing and capital markets solutions ("Atlas"). In March 2023, in connection with the Credit Suisse Securitized Products Sale, certain of our subsidiaries consented to the assignment of the loans and commitments of the Credit Suisse lenders to the Atlas lenders (such assignment, the "EZOP Assignment") under the EZOP revolving credit facility. In connection with the EZOP Assignment, Credit Suisse AG, New York Branch ("CSNYB") resigned as the agent under the EZOP revolving credit facility, Atlas Securitized Products Holdings, L.P. (the "Successor Agent") was appointed as the successor agent thereunder and, in connection with such appointment, the Successor Agent assumed the agent roles under the EZOP revolving credit facility. In connection with the appointment of Atlas as Successor Agent, the borrowers and the lenders party to the applicable agency resignation and appointment agreements consented to, among other things, Atlas' ability to assign the agent role under the EZOP revolving credit facility to one of its affiliates subject to certain conditions set forth therein. In March 2023, after the EZOP Assignment, we amended the EZOP revolving credit facility to, among other things, (a) increase the aggregate commitment amount from $675.0 million to $775.0 million, (b) increase the uncommitted maximum facility amount from $800.0 million to $900.0 million, (c) amend and supplement certain defaulting lender provisions and (d) update the references from CSNYB, the predecessor agent, to Atlas, the successor agent, and remove or modify certain provisions related to the borrowing, funding and allocation of payments among the previous lender syndicate (that previously included lenders affiliated with Credit Suisse that, prior to the date of the amendment to the EZOP revolving credit facility and pursuant to the EZOP Assignment, had assigned their loans and commitments to lenders affiliated with Atlas). In August 2023, we amended and restated the EZOP revolving credit facility to, among other things, (a) increase the aggregate commitment amount from $775.0 million to $875.0 million, (b) increase the uncommitted maximum facility amount from $900.0 million to $1.0 billion, (c) extend the maturity date from November 2024 to November 2025 and (d) amend the Advance Rate (as defined therein). In October 2023, we amended the EZOP revolving credit facility to, among other things, reallocate commitments among the lenders. In February 2024, we amended the EZOP revolving credit facility to, among other things, (a) reflect certain assignments of commitments occurring within the Atlas Lender Group (as defined by such revolving credit facility) without increasing the existing commitments, and the assignment of the role of the Atlas funding agent for the Atlas Lender Group, (b) amend the thresholds for certain "Amortization Events" (as defined by such revolving credit facility) and (c) modify the "Liquidity Reserve Account Required Balance" (as defined by such revolving credit facility). As of December 31, 2023, we had $364.0 million of available borrowing capacity under the EZOP revolving credit facility.

In September 2019, one of our subsidiaries, TEPH, entered into a secured revolving credit facility with Credit Suisse AG, New York Branch, as administrative agent, and the lenders party thereto. The TEPH revolving credit facility was previously amended in 2019, 2020, 2021 and 2022 and was amended and restated in 2023 as described below. Under the amended TEPH revolving credit facility, TEPH may borrow up to an aggregate committed amount of $1.311 billion with an uncommitted maximum facility amount of $1.575 billion, subject to a borrowing base based on the aggregate discounted solar asset balance of eligible solar assets multiplied by the applicable advance rate for each type of solar asset. The eligible solar assets are owned by TEPH's subsidiaries, which are primarily tax equity funds, subject to certain concentration limitations. The TEPH revolving credit facility has a maturity date occurring in November 2025. The proceeds from the TEPH revolving credit facility are available for funding certain reserve accounts required by the TEPH revolving credit facility, making distributions to us and paying fees incurred in connection with closing the TEPH revolving credit facility. The TEPH revolving credit facility bears interest at an annual rate based on either (a) Term SOFR (as defined by such revolving credit facility) plus a margin specific to each lender or (b) in the case of certain conduit lenders and other lenders, such lender's Commercial Paper Rate (as defined by such revolving credit facility). Sunnova Energy Corporation guarantees the performance obligations of certain affiliates under agreements entered into in connection with the TEPH revolving credit facility, as well as certain indemnity and repurchase obligations. In March 2023, in connection with the Credit Suisse Securitized Products Sale, certain of our subsidiaries consented to the assignment of the loans and commitments of the Credit Suisse lenders to the Atlas lenders (such assignment, the "TEPH Assignment") under the revolving credit facility by and among TEPH, certain of our other subsidiaries party thereto, Atlas Securitized Products Holdings, L.P. (as successor to CSNYB), as agent, and the lenders and other financial institutions party thereto. In connection with the TEPH Assignment, CSNYB resigned as the agent under the TEPH revolving credit facility, Atlas was appointed as the successor agent thereunder and, in connection with such appointment, the Successor Agent assumed the agent roles under the TEPH revolving credit facility. In connection with the appointment of Atlas as Successor Agent, the borrowers and the lenders party to the applicable agency resignation and appointment agreements consented to, among other things, Atlas' ability to assign the agent role under the TEPH revolving credit facility to one of its affiliates subject to certain conditions set forth therein. In March 2023, after the TEPH Assignment, we amended the TEPH revolving credit facility to, among other things, (a) increase the aggregate commitment amount from $600.0 million to $700.0 million, (b) increase the uncommitted maximum facility amount from $689.7 million to $789.7 million, (c) add provisions to allow TEPH to request an increase in the aggregate commitment amount (subject to certain conditions) by adding additional lenders to the TEPH revolving credit facility, (d) amend and supplement certain defaulting lender provisions, (e) modify the hedging provisions to give all hedge counterparties the benefit of certain payment priorities and certain other terms previously limited to qualifying hedge counterparties (as defined by such revolving credit facility), to extend the time period for the event of default resulting from hedge counterparties ceasing to be qualifying hedge counterparties and to make other hedge-related amendments, (f) update the references from CSNYB, the predecessor administrative agent, to Atlas, the successor administrative agent, and remove or modify certain provisions related to the borrowing, funding and allocation of payments among the previous lender syndicate (that previously included lenders affiliated with Credit Suisse that, prior to the date of the amendment to the TEPH revolving credit facility and pursuant to the TEPH Assignment, had assigned their loans and commitments to lenders affiliated with Atlas), (g) add European Union bail-in provisions and (h) add certain syndication-related provisions. In August 2023, we amended the TEPH revolving credit facility to, among other things, (a) increase the aggregate commitment amount from $700.0 million to $769.3 million, (b) increase the uncommitted maximum facility amount from $789.7 million to $859.0 million and (c) extend the maturity date from November 2024 to November 2025. In November 2023, we amended and restated the TEPH revolving credit facility to, among other things, (a) increase the aggregate commitment amount from $769.3 million to $1.309 billion and (b) increase the uncommitted maximum facility amount from $859.0 million to $1.575 billion. In December 2023, an additional lender joined the TEPH revolving credit facility and the aggregate commitment amount was increased from $1.309 billion to $1.311 billion. In February 2024, we amended the TEPH revolving credit facility to, among other things, reflect an assignment of commitments occurring within the Atlas Lender Group (as defined by such revolving credit facility) without increasing the existing commitments and the appointment of a new Atlas funding agent for the Atlas Lender Group. As of December 31, 2023, we had $272.4 million of available borrowing capacity under the TEPH revolving credit facility.

In September 2020, one of our subsidiaries, Sunnova Asset Portfolio 8, LLC ("AP8"), entered into a secured revolving credit facility with Banco Popular de Puerto Rico, as agent, and the lenders party thereto. The AP8 revolving credit facility was previously amended in 2021 and 2022 and was amended in 2023 as described below. Under the amended AP8 revolving credit facility, AP8 may borrow up to an initial aggregate committed amount of $215.0 million, subject to a borrowing base calculated based on the sum of a specified advance rate applied to the net outstanding principal balance of the solar loans securing the AP8 revolving credit facility and the aggregate value of the solar energy systems owned by AP8's subsidiaries, which are primarily tax equity funds, subject to certain concentration limitations. The AP8 revolving credit facility has a maturity date occurring in September 2024. The proceeds of the loans under the AP8 revolving credit facility are available for funding the purchase of solar loans, making deposits in AP8's reserve account and paying fees in connection with the AP8 revolving credit facility. The AP8 revolving credit facility bears interest at an annual rate based on Term SOFR (as defined by such revolving credit facility) plus 3.00% per annum. Sunnova Energy Corporation guarantees the performance obligations of certain affiliates under agreements entered into in connection with the AP8 revolving credit facility, as well as certain indemnity and repurchase obligations. In March 2023, we amended the AP8 revolving credit facility to, among other things, increase the aggregate commitment amount from $75.0 million to $150.0 million. In June 2023, we amended the AP8 revolving credit facility to, among other things, increase the aggregate commitment amount from $150.0 million to $185.0 million. In August 2023, we amended the AP8 revolving credit facility to, among other things, increase the aggregate commitment amount from $185.0 million to $215.0 million. We believe we will be able to satisfy this obligation due in September 2024 through refinancing of the facility or alternatively through the use of our existing cash resources and liquidity. As of December 31, 2023, we had no available borrowing capacity under the AP8 revolving credit facility.

In March 2023, one of our subsidiaries, Sunnova Inventory Supply, LLC ("IS"), entered into a secured revolving credit facility with Texas Capital Bank, as agent, and the lenders party thereto, for an aggregate commitment amount of $50.0 million with a maturity date of the earlier of (a) March 2026 and (b) six months from the latest maturity date of any material parent credit facility (defined as a parent credit facility with a commitment of $250.0 million or more that, if terminated could individually be expected to result in a liquidity event (as defined by such revolving credit facility)). The proceeds of the loans under the IS revolving credit facility are available to purchase or otherwise acquire certain accounts receivable and inventory, fund certain reserve accounts that are required to be maintained by IS in accordance with the revolving credit agreement and pay fees and expenses incurred in connection with the IS revolving credit facility. Interest on the borrowings under the IS revolving credit facility is due monthly. Borrowings under the IS revolving credit facility bear interest at an annual rate based on Term SOFR (as defined by such revolving credit facility). As of December 31, 2023, we had $18.7 million of available borrowing capacity under the IS revolving credit facility.

In September 2023, one of our subsidiaries, Sunnova Asset Portfolio 9, LLC ("AP9"), entered into a secured revolving credit facility with Citibank, N.A., as administrative agent, and the lenders party thereto, for an aggregate commitment amount of $65.0 million, subject to a borrowing base calculated based on the sum of a specified advance rate applied to the net aggregate balance of the home improvement loans securing the AP9 revolving credit facility. The AP9 revolving credit facility has a maturity date occurring in October 2027. The proceeds of the loans under the AP9 revolving credit facility are available for funding the purchase of home improvement loans and the related home improvement assets, making deposits in AP9's reserve account and paying fees and expenses in connection with the AP9 revolving credit facility. Interest on the borrowings under the AP9 revolving credit facility is due monthly. Borrowings under the AP9 revolving credit facility bear interest at an annual rate based on Term SOFR (as defined by such revolving credit facility) plus a margin specific to each lender. In connection with the AP9 revolving credit facility, one of our affiliates receives a fee for servicing the home improvement loans and related home improvement assets pursuant to a servicing agreement. In addition, Sunnova Energy Corporation guarantees the performance obligations of certain affiliates under agreements entered into in connection with the AP9 revolving credit facility, as well as certain indemnity and repurchase obligations. Obligations of AP9 under the AP9 revolving credit facility are secured by first priority liens on substantially all of the assets of AP9. Certain obligations of AP9H under the sale and contribution agreement are secured by a first priority lien on the equity of AP9 owned by AP9H. As of December 31, 2023, we had $52.9 million of available borrowing capacity under the AP9 revolving credit facility.

In December 2023, one of our subsidiaries, BMB, along with its two wholly-owned subsidiaries, entered into a secured revolving credit facility with Mitsubishi HC Capital America, Inc., as administrative agent, and the lenders party thereto from time to time, for an aggregate principal amount of up to $25.0 million with a maturity date for each loan thereunder as set forth in the BMB revolving credit facility and, in any event, no later than December 27, 2025 (after giving effect to any extension thereof pursuant to that aforementioned BMB revolving credit facility). The proceeds of the loans under the BMB revolving credit facility are available to, among other things, finance project costs related to commercial, industrial and other solar energy systems and energy storage systems owned by BMB or one of its subsidiaries or by a customer (each, a "Project"). The BMB revolving credit facility is also available to finance completed Projects. Interest on the borrowings under the BMB revolving credit facility is due monthly (or, in the case of borrowings for construction loans, paid in kind monthly). Borrowings under the BMB revolving credit facility bear interest at an annual rate (which can vary for different Projects) based on Term SOFR plus a specified margin or, in the case of certain term loans for completed Projects, a fixed margin. In connection with the BMB revolving credit facility, certain of our affiliates receive fees for managing and servicing the Projects pursuant to certain management and servicing agreements. In addition, Sunnova Energy Corporation guarantees the obligations of certain of its affiliates under those certain management agreements, servicing agreements, a sale and contribution agreement and a development and purchase agreement. As of December 31, 2023, no borrowings have been made from the BMB revolving credit facility.

Securitizations

We from time to time securitize customer agreements and related assets as a source of funding. We access the Rule 144A asset-backed securitization market using wholly-owned special purpose entities to securitize pools of assets, which historically have been solar energy systems and the related lease agreements and PPAs and ancillary rights and agreements both directly or indirectly through interests in the managing member of our tax equity funds. We also securitize our loan agreements and ancillary rights and agreements.

In February 2021, one of our subsidiaries issued $150.1 million in aggregate principal amount of Series 2021-A Class A solar loan-backed notes and $38.6 million in aggregate principal amount of Series 2021-A Class B solar loan-backed notes (collectively, the "HELV Notes") with a maturity date of February 2048. The HELV Notes bear interest at an annual rate of 1.80% and 3.15% for the Class A and Class B notes, respectively.

In June 2021, one of our subsidiaries issued $319.0 million in aggregate principal amount of Series 2021-1 solar asset-backed notes (the "SOLIII Notes") with a maturity date of April 2056. The SOLIII Notes bear interest at an annual rate of 2.58%.

In July 2021, one of our subsidiaries issued $106.2 million in aggregate principal amount of Series 2021-B Class A solar loan-backed notes and $106.2 million in aggregate principal amount of Series 2021-B Class B solar loan-backed notes (collectively the "HELVI Notes") with a maturity date of July 2048. The HELVI Notes bear interest at an annual rate of 1.62% and 2.01% for the Class A and Class B notes, respectively.

In October 2021, one of our subsidiaries issued $68.4 million in aggregate principal amount of Series 2021-C Class A solar loan-backed notes, $55.9 million in aggregate principal amount of Series 2021-C Class B solar loan-backed notes and $31.5 million in aggregate principal amount of Series 2021-C Class C solar loan-backed notes (collectively, the "HELVII Notes") with a maturity date of October 2048. The HELVII Notes bear interest at an annual rate of 2.03%, 2.33% and 2.63% for the Class A, Class B and Class C notes, respectively.

In February 2022, one of our subsidiaries entered into a Note Purchase Agreement related to the sale of $131.9 million in aggregate principal amount of Series 2022-A Class A solar loan-backed notes, $102.2 million in aggregate principal amount of Series 2022-A Class B solar loan-backed notes and $63.8 million in aggregate principal amount of Series 2022-A Class C solar loan-backed notes (collectively, the "HELVIII Notes") with a maturity date of February 2049. The HELVIII Notes bear interest at an annual rate of 2.79%, 3.13% and 3.53% for the Class A, Class B and Class C notes, respectively.

In June 2022, one of our subsidiaries issued $317.0 million in aggregate principal amount of Series 2022-1 Class A solar asset-backed notes and $38.0 million in aggregate principal amount of Series 2022-1 Class B solar asset-backed notes (collectively, the "SOLIV Notes") with a maturity date of April 2057. The SOLIV Notes bear interest at an annual rate of 4.95% and 6.35% for the Class A and Class B notes, respectively.

In August 2022, one of our subsidiaries issued $178.0 million in aggregate principal amount of Series 2022-B Class A solar loan-backed notes and $49.7 million in aggregate principal amount of Series 2022-B Class B solar loan-backed notes (collectively, the "HELIX Notes") with a maturity date of August 2049. The HELIX Notes bear interest at an annual rate of 5.00% and 6.00% for the Class A and Class B notes, respectively.

In November 2022, one of our subsidiaries issued $103.4 million in aggregate principal amount of Series 2022-C Class A solar loan-backed notes, $80.6 million in aggregate principal amount of Series 2022-C Class B solar loan-backed notes and $51.7 million in aggregate principal amount of Series 2022-C Class C solar loan-backed notes (collectively, the "HELX Notes") with a maturity date of November 2049. The HELX Notes bear interest at an annual rate of 5.30%, 5.60% and 6.00% for the Class A, Class B and Class C notes, respectively.

In April 2023, one of our subsidiaries issued $300.0 million in aggregate principal amount of Series 2023-1 Class A solar asset-backed notes and $23.5 million in aggregate principal amount of Series 2023-1 Class B solar asset-backed notes (collectively, the "SOLV Notes") with a maturity date of April 2058. The SOLV Notes bear interest at an annual rate of 5.40% and 7.35% for the Class A and Class B notes, respectively.

In May 2023, one of our subsidiaries issued $174.9 million in aggregate principal amount of Series 2023-A Class A solar loan-backed notes, $80.1 million in aggregate principal amount of Series 2023-A Class B solar loan-backed notes and $31.7 million in aggregate principal amount of Series 2023-A Class C solar loan-backed notes (collectively, the "HELXI Notes") with a maturity date of May 2050. The HELXI Notes bear interest at an annual rate of 5.30%, 5.60% and 6.00% for the Class A, Class B and Class C notes, respectively.

In August 2023, one of our subsidiaries issued $148.5 million in aggregate principal amount of Series 2023-B Class A solar loan-backed notes, $71.1 million in aggregate principal amount of Series 2023-B Class B solar loan-backed notes and $23.1 million in aggregate principal amount of Series 2023-B Class C solar loan-backed notes (collectively, the "HELXII Notes") with a maturity date of August 2050. The HELXII Notes bear interest at an annual rate of 5.30%, 5.60% and 6.00%, for the Class A, Class B and Class C notes, respectively.

In September 2023, we entered into a $3.0 billion partial loan guarantee agreement (the "Hestia Agreement") with the DOE representing a commitment to guarantee 90% of up to approximately $3.3 billion of certain of our future financing arrangements. We anticipate the Hestia Agreement will support future loan originations, reduce our weighted average cost of capital and generate interest savings. Before the DOE issues loan guarantees under the Hestia Agreement, various customary conditions must be fulfilled. There is no assurance of the DOE's conditional commitment will be fulfilled on the terms announced or at all or that the related guarantees will provide the anticipated benefits to us. In October 2023, one of our subsidiaries issued $219.6 million in aggregate principal amount of Series 2023-GRID1 Class A solar loan-backed notes and $24.4 million in aggregate principal amount of Series 2023-GRID1 Class B solar loan-backed notes with a maturity date of December 2050. The HESI Notes bear interest at an annual rate of 5.75% and 8.25% for the Class A and Class B notes, respectively. The Class A notes indirectly benefit from a partial guarantee provided by the DOE Loan Programs Office pursuant to the Hestia Agreement. The HESI Notes are not directly guaranteed by the DOE.

In February 2024, one of our subsidiaries issued $194.5 million in aggregate principal amount of Series 2024-1 Class A solar asset-backed notes, $16.5 million in aggregate principal amount of Series 2024-1 Class B solar asset-backed notes and $15.0 million in aggregate principal amount of Series 2024-1 Class C solar asset-backed notes with a maturity date of January 2059. The SOLVI Notes bear interest at an annual rate of 5.65%, 7.00% and 9.00% for the Class A, Class B and Class C notes, respectively.

The securitization structures include certain features designed to protect investors. The primary feature relates to the availability and adequacy of cash flows in the securitized pool of assets to meet contractual requirements, the insufficiency of which triggers an early repayment of the notes. We refer to this as "early amortization", which may be based on, among other things, a debt service coverage ratio falling or remaining below certain levels. As of December 31, 2023, we have not had any early amortizations under any of our securitizations. In the event of an early amortization, the notes issuer would be required to repay the affected outstanding securitized borrowings using available collections received from the asset pool. However, the period of ultimate repayment would be determined based on the amount and timing of collections received and, in limited circumstances, early amortization may be cured prior to full repayment. An early amortization event would impair our liquidity and may require us to utilize our available non-securitization related contingent liquidity or rely on alternative funding sources, which may or may not be available at the time. The indentures of our securitizations also typically contain customary events of default for solar securitizations that may entitle the noteholders to take various actions, including the acceleration of amounts due under the related indenture and foreclosure on the issuer's assets.

Senior Notes

In May 2021, we issued and sold an aggregate principal amount of $575.0 million of our 0.25% convertible senior notes ("0.25% convertible senior notes") in a private placement at a discount to the initial purchasers of 2.5%, for an aggregate purchase price of $560.6 million. The 0.25% convertible senior notes mature in December 2026 unless earlier redeemed, repurchased or converted. In connection with the pricing of the 0.25% convertible senior notes, we used proceeds of $91.7 million to enter into privately negotiated capped call transactions, which are expected to reduce the potential dilution to common shares and/or offset potential cash payments that could be required to be made in excess of the principal amount upon any exchange of notes. Such reduction and/or offset is subject to a cap initially equal to $60.00 per share, subject to adjustments.

In August 2021, we issued and sold an aggregate principal amount of $400.0 million of our 5.875% senior notes ("5.875% senior notes") in a private placement at a discount to the initial purchasers of 1.24%, for an aggregate purchase price of $395.0 million. The 5.875% senior notes mature in September 2026.

In August 2022, we issued and sold an aggregate principal amount of $600.0 million of our 2.625% convertible senior notes ("2.625% convertible senior notes") in a private placement at a discount to the initial purchasers of 2.5%, for an aggregate purchase price of $585.0 million. The 2.625% convertible senior notes mature in February 2028 unless earlier redeemed, repurchased or converted. In connection with the pricing of the 2.625% convertible senior notes, we used proceeds of $48.4 million to enter into privately negotiated capped call transactions, which are expected to reduce the potential dilution to common shares and/or offset potential cash payments that could be required to be made in excess of the principal amount upon any exchange of notes. Such reduction and/or offset is subject to a cap initially equal to $34.24 per share, subject to adjustments.

In September 2023, we issued and sold an aggregate principal amount of $400.0 million of 11.75% senior notes at a discount to the initial purchasers of approximately 2.74%, for an aggregate purchase price of approximately $389.0 million. The 11.75% senior notes mature in October 2028.

Public Offerings

In August 2023, we sold 5,865,000 shares of common stock at a public offering price of $14.75 per share. We received aggregate net proceeds of approximately $82.2 million, after deducting underwriting discounts and commissions of approximately $3.9 million and offering expenses of approximately $400,000.

Contractual Obligations

The following table summarizes our contractual obligations as of December 31, 2023:

		Payments Due by Period (1)			
	Total	2024	2025-2026	2027-2028	Beyond 2028
			(in thousands)		
Debt obligations (including future interest) (2)	$ 9,128,711	$ 886,241	$ 3,593,587	$ 4,648,883	$ —
AROs (3)	294,317	—	—	—	294,317
Operating lease payments (4)	18,875	3,441	6,645	6,676	2,113
Finance lease payments	3,256	1,498	1,481	277	—
Guaranteed performance obligations	6,753	2,667	3,027	1,059	—
Inventory purchase obligations	255,000	255,000	—	—	—
Other obligations (5)	57,704	35,889	13,380	7,920	515
Total	$ 9,764,616	$ 1,184,736	$ 3,618,120	$ 4,664,815	$ 296,945

(1) Does not include amounts related to the contingent obligation to purchase all of a tax equity investor's units upon exercise of their withdrawal rights. The withdrawal price for the tax equity investors' interest in the respective fund is equal to the lesser of: (a) a fixed price and (b) the fair market value of such interest. Due to uncertainties associated with estimating the timing and amount of the withdrawal price, we cannot determine the potential future payments that we could have to make under these withdrawal rights. For additional information regarding the withdrawal rights see

Note 13, Redeemable Noncontrolling Interests and Noncontrolling Interests, to our consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

(2) Interest payments related to long-term debt and interest rate swaps and caps are calculated and estimated for the periods presented based on the amount of debt outstanding and the interest rates as of December 31, 2023.

(3) AROs represents our estimated future retirement obligations on an undiscounted basis.

(4) Amounts are net of reimbursements of approximately $76,000 for leasehold improvements expected in 2024.

(5) Other obligations relate to information technology services and licenses and distributions payable to redeemable noncontrolling interests.

Historical Cash Flows—Year Ended December 31, 2023 Compared to Year Ended December 31, 2022

The following table summarizes our cash flows for the periods indicated:

	Year Ended December 31,		
	2023	2022	Change
		(in thousands)	
Net cash used in operating activities	$ (237,562)	$ (333,426)	$ 95,864
Net cash used in investing activities	(2,544,661)	(1,981,602)	(563,059)
Net cash provided by financing activities	2,731,051	2,468,705	262,346
Net increase (decrease) in cash, cash equivalents and restricted cash	$ (51,172)	$ 153,677	$ (204,849)

Operating Activities

Net cash used in operating activities decreased by $95.9 million in the year ended December 31, 2023 compared to the year ended December 31, 2022. This decrease is primarily due to a decrease in purchases of inventory and prepaid inventory of $191.9 million. This decrease is also due to net outflows of $133.6 million in 2023 compared to net inflows of $12.8 million in 2022 based on: (a) our net loss of $502.4 million in 2023 excluding non-cash operating items of $368.8 million, primarily from depreciation, impairments and losses on disposals, amortization of intangible assets, amortization of deferred financing costs and debt discounts, non-cash direct sales revenue, provision for current expected credit losses and other bad debt expense, unrealized net losses on derivatives, unrealized net losses on fair value instruments and equity securities and equity-based compensation charges, which results in net outflows of $133.6 million and (b) our net loss of $130.3 million in 2022 excluding non-cash operating items of $143.1 million, primarily from depreciation, impairments and losses on disposals, amortization of intangible assets, amortization of deferred financing costs and debt discounts, non-cash direct sales revenue, provision for current expected credit losses and other bad debt expense, unrealized net gains on derivatives, unrealized net gains on fair value instruments and equity-based compensation charges, which results in net inflows of $12.8 million. These net differences between the two periods resulted in a net change in operating cash flows of $146.4 million in 2023 compared to 2022.

Investing Activities

Net cash used in investing activities increased by $563.1 million in the year ended December 31, 2023 compared to the year ended December 31, 2022. This increase is primarily due to an increase in purchases of property and equipment, primarily solar energy systems, of $964.5 million. This increase is partially offset by a decrease in payments for investments and customer notes receivable of $326.7 million and an increase in proceeds from customer notes receivable of $71.0 million.

Financing Activities

Net cash provided by financing activities increased by $262.3 million in the year ended December 31, 2023 compared to the year ended December 31, 2022. This increase is primarily due to increases in net contributions from our redeemable noncontrolling interests and noncontrolling interests of $224.3 million and net proceeds from the issuance of common stock of $84.5 million. This increase is partially offset by a decrease in net borrowings under our debt facilities of $50.7 million.

Historical Cash Flows—Year Ended December 31, 2022 Compared to Year Ended December 31, 2021

See "*Management's Discussion and Analysis of Financial Condition and Results of Operations—Historical Cash Flows—Year Ended December 31, 2022 Compared to Year Ended December 31, 2021*" in our Annual Report on Form 10-K filed with the SEC on February 23, 2023 pursuant to the Securities Exchange Act of 1934, as amended.

Seasonality

See "*Business—Seasonality"*.

Critical Accounting Policies and Estimates

Our discussion and analysis of our financial condition and results of operations is based upon our consolidated financial statements, which have been prepared in accordance with GAAP which requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenue, expenses, cash flows and related disclosures. We base our estimates on historical experience and on various other assumptions we believe to be reasonable under the circumstances. In many instances, we could have reasonably used different accounting estimates, and in other instances, changes in the accounting estimates are reasonably likely to occur from period-to-period. Actual results may differ from these estimates. Our future consolidated financial statements will be affected to the extent our actual results materially differ from these estimates.

We identify our most critical accounting policies as those that are the most pervasive and important to the portrayal of our financial position and results of operations, and that require the most difficult, subjective, and/or complex judgments by management regarding estimates about matters that are inherently uncertain. We believe the assumptions and estimates associated with our principles of consolidation, the valuation of assets acquired and liabilities assumed in acquisitions, the estimated useful life of our solar energy systems, the valuation of the removal assumptions, including costs, associated with AROs, the valuation of redeemable noncontrolling interests and noncontrolling interests and our allowance for current expected credit losses have the greatest subjectivity and impact on our consolidated financial statements. Therefore, we consider these to be our critical accounting policies and estimates and discuss these items in detail below. See Note 2, Significant Accounting Policies, to our consolidated financial statements included elsewhere in this Annual Report on Form 10-K for further discussion of our accounting policies.

Principles of Consolidation

Our consolidated financial statements reflect our accounts and those of our subsidiaries in which we have a controlling financial interest. The typical condition for a controlling financial interest is holding a majority of the voting interests of an entity. However, a controlling financial interest may also exist in entities, such as variable interest entities ("VIEs"), through arrangements that do not involve holding a majority of the voting interests. We consolidate any VIE of which we are the primary beneficiary, which is defined as the party that has (a) the power to direct the activities of a VIE that most significantly impact the VIE's economic performance and (b) the obligation to absorb losses or receive benefits from the VIE that could potentially be significant to the VIE. We evaluate our relationships with our VIEs on an ongoing basis to determine whether we continue to be the primary beneficiary. We have eliminated all intercompany transactions in consolidation.

Useful Life of Solar Energy Systems

Our solar energy systems have an estimated useful life of 35 years. We considered both (a) available information related to the technology currently being employed in the solar energy systems and (b) the terms of the solar leases that have a 25 year term with two five-year renewal options to conclude a 35 year useful life is appropriate. In addition, we reviewed numerous published and online sources from academia, government institutions and private industry and held discussions with certain manufacturers of our solar energy systems to support our estimated useful life of 35 years for the crystalline silicone solar modules we use. We define the useful life of a solar module as the duration for which a solar module operates at or above 80% of its initial power output, which we understand to be the generally accepted standard used by government, academia and the solar industry.

Depreciation and amortization of solar energy systems are calculated using the straight-line method over the estimated useful lives of the solar energy systems and are recorded in cost of revenue—depreciation. Depreciation begins when a solar energy system is placed in service. Costs associated with improvements to a solar energy system, which extend the life, increase the capacity or improve the efficiency of the solar energy systems, are capitalized and depreciated over the remaining life of the asset.

ARO

We have AROs arising from contractual or regulatory requirements to perform certain asset retirement activities at the time the solar energy systems are disposed. We recognize an ARO at the point an obligating event takes place, typically when the solar energy system is placed in service. An asset is considered retired when it is permanently taken out of service, such as through a sale or disposal.

The liability is initially measured at fair value based on the present value of estimated removal costs and subsequently adjusted for changes in the underlying assumptions and for accretion expense. We estimate approximately half of our solar energy systems will require removal at our expense in the future. The corresponding asset retirement costs are capitalized as part of the carrying amount of the solar energy system and depreciated over the solar energy system's remaining useful life. We may revise our estimated future liabilities based on recent actual experiences, changes in certain customer-specific estimates and other cost estimate changes. If there are changes in estimated future costs, those changes will be recorded as either a reduction or addition in the carrying amount of the remaining unamortized asset and the ARO and either decrease or increase depreciation and accretion expense amounts prospectively. Inherent in the calculation of the fair value of our AROs are numerous assumptions and judgments, including the ultimate settlement amounts, inflation factors, credit adjusted discount rates, timing of settlement and changes in the legal, regulatory, environmental and political environments. Due to the intrinsic uncertainties present when estimating asset retirement costs, as well as asset retirement dates, our ARO estimates are subject to ongoing volatility.

Redeemable Noncontrolling Interests and Noncontrolling Interests

Noncontrolling interests represent third-party interests in the net assets of certain consolidated subsidiaries (the "tax equity entities"). For these tax equity entities, we have determined the appropriate methodology for calculating the noncontrolling interest balances that reflects the substantive economic arrangements in the operating agreements is a balance sheet approach using the hypothetical liquidation at book value ("HLBV") method. Under the HLBV method, the amounts reported as noncontrolling interests in the consolidated balance sheets represent the amounts third-party investors would hypothetically receive at each balance sheet date under the liquidation provisions of the operating agreements, assuming the net assets of the subsidiaries were liquidated at amounts determined in accordance with GAAP and distributed to the investors. The noncontrolling interest balances in these subsidiaries are reported as a component of equity in the consolidated balance sheets. The amount of income or loss allocated to noncontrolling interests in the results of operations for the subsidiaries using HLBV are determined as the difference in the noncontrolling interest balances in the consolidated balance sheets at the start and end of each reporting period, after taking into account any capital transactions between the subsidiaries and the third-party investors. Factors used in the HLBV calculation include GAAP income (loss), taxable income (loss), capital contributions, investment tax credits, distributions and the stipulated targeted investor return specified in the subsidiaries' operating agreements. Changes in these factors could have a significant impact on the amounts that investors would receive upon a hypothetical liquidation. The use of the HLBV method to allocate income (loss) to the noncontrolling interest holders may create volatility in the consolidated statements of operations as the application of HLBV can drive changes in net income or loss attributable to noncontrolling interests from period to period. We classify certain noncontrolling interests with redemption features that are not solely within our control outside of permanent equity in the consolidated balance sheets. Redeemable noncontrolling interests are reported using the greater of the carrying value at each reporting date as determined by the HLBV method or the estimated redemption value at the end of each reporting period. Estimating the redemption value of the redeemable noncontrolling interests requires the use of significant assumptions and estimates, such as projected future cash flows.

Current Expected Credit Losses

Our allowance for current expected credit losses is deducted from the customer notes receivable amortized cost to present the net amount expected to be collected. It is measured on a collective (pool) basis when similar risk characteristics (such as financial asset type, customer credit rating, contractual term and vintage) exist. In determining the allowance for credit losses, we identify customers with potential disputes or collection issues and consider our historical level of credit losses and current economic trends that might impact the level of future credit losses. Adjustments to historical loss information are made for differences in current loan-specific risk characteristics, such as differences in underwriting standards. Expected credit losses are estimated over the contractual term of the loan agreements based on the best available data at the time, and are adjusted for expected prepayments when appropriate. The contractual term excludes expected extensions, renewals and modifications unless either of the following applies: (a) we have a reasonable expectation at the reporting date that a troubled debt restructuring will be executed with an individual customer or (b) the extension or renewal options are included in the original or modified contract at the reporting date and are not unconditionally cancelable by us. We review the allowance quarterly for any significant macroeconomic trends affecting the market but not yet impacting us. Assessments performed throughout the year include normal macroeconomic trends (e.g. delinquency and default and loss rates from leading credit bureaus by industry). While making adjustments to loss rates is ultimately a subjective determination, we have created an internal and external data-driven evaluation process to ensure any adjustments or updates to the model are informed and fact-based prior to executing such a change.

Recent Accounting Pronouncements

See Note 2, Significant Accounting Policies, to our consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

We are exposed to various market risks in the ordinary course of our business. Market risk is the potential loss that may result from market changes associated with our business or with an existing or forecasted financial or commodity transaction. Our primary exposure includes changes in interest rates because certain borrowings bear interest at floating rates based on SOFR or a similar index plus a specified margin. We sometimes manage our interest rate exposure on floating-rate debt by entering into derivative instruments to hedge all or a portion of our interest rate exposure on certain debt facilities. We do not enter into any derivative instruments for trading or speculative purposes. Changes in economic conditions could result in higher interest rates, thereby increasing our interest expense and operating expenses and reducing funds available to capital investments, operations and other purposes. A hypothetical 10% increase in our interest rates on our variable-rate debt facilities would have increased our interest expense by $12.1 million and $3.7 million for the years ended December 31, 2023 and 2022, respectively.

Item 8. Financial Statements and Supplementary Data.

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of Sunnova Energy International Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Sunnova Energy International Inc. and its subsidiaries (the "Company") as of December 31, 2023 and 2022, and the related consolidated statements of operations, of redeemable noncontrolling interests and equity and of cash flows for each of the three years in the period ended December 31, 2023, including the related notes and financial statement schedule listed in the accompanying index (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2023, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2023 and 2022, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2023 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2023, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Report on Internal Control over Financial Reporting appearing under Item 9A. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

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

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

Critical Audit Matters

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that (i) relates to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Initial Accounting Assessment of New Tax Equity Partnerships ("TEPs"

As described in Notes 1, 2, and 13 to the consolidated financial statements, the Company admitted tax equity investors of TEP7E, TEP7F, TEP7G, TEP8A, and TEP8C through a TEP structure in 2023. As of December 31, 2023, the Company had approximately $165.9 million of redeemable noncontrolling interest and $436.2 million of noncontrolling interest, a portion of which relates to these TEPs. The Company forms TEPs with its investors in the ordinary course of business to facilitate the funding and monetization of certain attributes associated with the Company's solar energy systems. The typical condition for a controlling financial interest is holding a majority of the voting interests of an entity. However, a controlling financial interest may also exist in entities, such as variable interest entities ("VIEs"), through arrangements that do not involve holding a majority of the voting interests. The Company consolidates a VIE when it is the primary beneficiary, which is defined as the party that has (a) the power to direct the activities of the VIE that most significantly impact the VIE's economic performance and (b) the obligation to absorb losses or the right to receive benefits from the VIE that could potentially be significant to the VIE. As disclosed by management, assets, liabilities and operating results of these partnerships are consolidated in the financial statements. The tax equity investors' share of the net assets of these tax equity funds are recognized as redeemable noncontrolling interests and noncontrolling interests in the consolidated balance sheet. Additionally, management has determined that the appropriate methodology for calculating the noncontrolling interest balances that reflects the substantive economic arrangements in the operating agreements is a balance sheet approach using the hypothetical liquidation at book value ("HLBV") method.

The principal considerations for our determination that performing procedures relating to the initial accounting assessment of new TEP arrangements is a critical audit matter are the significant judgment by management in the assessment of whether the Company is the primary beneficiary of the TEP, thus requiring consolidation of the entity, as well as the application of the HLBV methodology based on the terms of the operating agreements in the initial year, which in turn led to a high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating the initial accounting assessment of whether the Company is the primary beneficiary of the new TEP and the application of the HLBV methodology based on the substantive economic arrangements of the TEP operating agreements. In addition, the audit effort involved the use of professionals with specialized skill and knowledge.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's assessment of the initial accounting for the new TEPs. These procedures also included, among others, (i) using professionals with specialized skill and knowledge to evaluate the appropriateness of management's application of the HLBV methodology based on the substantive economic arrangements of the TEP operating agreements and (ii) evaluating management's assessment of whether the Company qualifies as the primary beneficiary of the TEP, and therefore consolidates the TEP.

/s/ PricewaterhouseCoopers LLP

Houston, Texas
February 22, 2024

We have served as the Company's auditor since 2014, which includes periods before the Company became subject to SEC reporting requirements.

SUNNOVA ENERGY INTERNATIONAL INC.
CONSOLIDATED BALANCE SHEETS
(in thousands, except share amounts and share par values)

	As of December 31,	
	2023	2022
Assets		
Current assets:		
Cash and cash equivalents	$ 212,832	$ 360,257
Accounts receivable—trade, net	40,767	24,435
Accounts receivable—other	253,350	212,397
Other current assets, net of allowance of $4,659 and $3,250 as of December 31, 2023 and 2022, respectively	429,299	351,300
Total current assets	936,248	948,389
Property and equipment, net	5,638,794	3,784,801
Customer notes receivable, net of allowance of $111,818 and $77,998 as of December 31, 2023 and 2022, respectively	3,735,986	2,466,149
Intangible assets, net	134,058	162,512
Goodwill	—	13,150
Other assets	895,885	961,891
Total assets (1)	$ 11,340,971	$ 8,336,892
Liabilities, Redeemable Noncontrolling Interests and Equity		
Current liabilities:		
Accounts payable	$ 355,791	$ 116,136
Accrued expenses	122,355	139,873
Current portion of long-term debt	483,497	214,431
Other current liabilities	133,649	71,506
Total current liabilities	1,095,292	541,946
Long-term debt, net	7,030,756	5,194,755
Other long-term liabilities	1,086,011	712,741
Total liabilities (1)	9,212,059	6,449,442
Commitments and contingencies (Note 17)		
Redeemable noncontrolling interests	165,872	165,737
Stockholders' equity:		
Common stock, 122,466,515 and 114,939,079 shares issued as of December 31, 2023 and 2022, respectively, at $0.0001 par value	12	11
Additional paid-in capital—common stock	1,755,461	1,637,847
Accumulated deficit	(228,583)	(364,782)
Total stockholders' equity	1,526,890	1,273,076
Noncontrolling interests	436,150	448,637
Total equity	1,963,040	1,721,713
Total liabilities, redeemable noncontrolling interests and equity	$ 11,340,971	$ 8,336,892

(1) The consolidated assets as of December 31, 2023 and 2022 include $5,297,816 and $3,201,271, respectively, of assets of variable interest entities ("VIEs") that can only be used to settle obligations of the VIEs. These assets include cash of $54,674 and $40,382 as of December 31, 2023 and 2022, respectively; accounts receivable—trade, net of $13,860 and $8,542 as of December 31, 2023 and 2022, respectively; accounts receivable—other of $187,607 and $810 as of December 31, 2023 and 2022, respectively; other current assets of $693,772 and $422,364 as of December 31, 2023 and 2022, respectively; property and equipment, net of $4,273,478 and $2,680,587 as of December 31, 2023 and 2022, respectively; and other assets of $74,425 and $48,586 as of December 31, 2023 and 2022, respectively. The consolidated liabilities as of December 31, 2023 and 2022 include $278,016 and $66,441, respectively, of liabilities of VIEs whose creditors have no recourse to Sunnova Energy International Inc. These liabilities include accounts payable of $197,072 and $9,015 as of December 31, 2023 and 2022, respectively; accrued expenses of $157 and $287 as of December 31, 2023 and 2022, respectively; other current liabilities of $7,269 and $4,420 as of December 31, 2023 and 2022, respectively; and other long-term liabilities of $73,518 and $52,719 as of December 31, 2023 and 2022, respectively.

See accompanying notes to consolidated financial statements.

SUNNOVA ENERGY INTERNATIONAL INC.
CONSOLIDATED STATEMENTS OF OPERATIONS
(in thousands, except share and per share amounts)

	Year Ended December 31,		
	2023	2022	2021
Revenue	$ 720,653	$ 557,690	$ 241,752
Operating expense:			
Cost of revenue—depreciation	130,261	96,280	76,474
Cost of revenue—inventory sales	176,371	178,310	—
Cost of revenue—other	120,865	52,487	21,834
Operations and maintenance	96,997	36,679	19,583
General and administrative	430,422	302,004	204,236
Goodwill impairment	13,150	—	—
Other operating income	(3,978)	(26,566)	(25,485)
Total operating expense, net	964,088	639,194	296,642
Operating loss	(243,435)	(81,504)	(54,890)
Interest expense, net	371,937	107,775	116,248
Interest income	(115,872)	(59,799)	(34,228)
Loss on extinguishment of long-term debt, net	—	—	9,824
Other (income) expense	3,949	(3,090)	516
Loss before income tax	(503,449)	(126,390)	(147,250)
Income tax (benefit) expense	(1,023)	3,886	260
Net loss	(502,426)	(130,276)	(147,510)
Net income (loss) attributable to redeemable noncontrolling interests and noncontrolling interests	(84,465)	31,366	(9,382)
Net loss attributable to stockholders	$ (417,961)	$ (161,642)	$ (138,128)
Net loss per share attributable to stockholders—basic and diluted	$ (3.53)	$ (1.41)	$ (1.25)
Weighted average common shares outstanding—basic and diluted	118,344,728	114,451,034	110,881,630

See accompanying notes to consolidated financial statements.

SUNNOVA ENERGY INTERNATIONAL INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(in thousands)

	Year Ended December 31,		
	2023	2022	2021
CASH FLOWS FROM OPERATING ACTIVITIES			
Net loss	$ (502,426)	$ (130,276)	$ (147,510)
Adjustments to reconcile net loss to net cash used in operating activities:			
Depreciation	153,387	108,167	85,600
Impairment and loss on disposals, net	56,592	8,459	3,655
Amortization of intangible assets	28,432	28,441	21,354
Amortization of deferred financing costs	25,226	13,640	14,050
Amortization of debt discount	19,174	9,342	9,949
Non-cash effect of equity-based compensation plans	25,535	24,218	17,236
Non-cash direct sales revenue	(60,590)	(8,484)	(1,212)
Provision for current expected credit losses and other bad debt expense	46,199	43,018	25,634
Unrealized (gain) loss on derivatives	67,318	(19,451)	(4,874)
Unrealized (gain) loss on fair value instruments and equity securities	188	(29,279)	(21,988)
Loss on extinguishment of long-term debt, net	—	—	9,824
Other non-cash items	7,332	(34,962)	5,695
Changes in components of operating assets and liabilities:			
Accounts receivable	101,125	(159,295)	(53,261)
Other current assets	(105,743)	(119,794)	(129,810)
Other assets	(115,488)	(124,981)	(70,758)
Accounts payable	(5,493)	4,486	(6,392)
Accrued expenses	(11,213)	48,385	27,908
Other current liabilities	43,665	11,772	5,963
Other long-term liabilities	(10,782)	(6,832)	(293)
Net cash used in operating activities	(237,562)	(333,426)	(209,230)
CASH FLOWS FROM INVESTING ACTIVITIES			
Purchases of property and equipment	(1,832,714)	(868,208)	(554,541)
Payments for investments and customer notes receivable	(909,488)	(1,236,228)	(728,926)
Proceeds from customer notes receivable	180,721	109,760	66,879
Payments for investments in solar receivables	—	—	(32,212)
Proceeds from investments in solar receivables	11,582	12,394	3,231
Other, net	5,238	680	4,353
Net cash used in investing activities	(2,544,661)	(1,981,602)	(1,241,216)
CASH FLOWS FROM FINANCING ACTIVITIES			
Proceeds from long-term debt	3,507,828	2,903,727	2,235,939
Payments of long-term debt	(1,406,022)	(758,355)	(947,130)
Payments on notes payable	(7,151)	—	(34,555)
Payments of deferred financing costs	(75,920)	(30,791)	(31,324)
Payments of debt discounts	—	—	(2,324)
Purchase of capped call transactions	—	(48,420)	(91,655)
Proceeds from issuance of common stock, net	81,316	(3,190)	10,513
Contributions from redeemable noncontrolling interests and noncontrolling interests	692,894	449,398	350,121
Distributions to redeemable noncontrolling interests and noncontrolling interests	(48,986)	(29,771)	(15,854)
Payments of costs related to redeemable noncontrolling interests and noncontrolling interests	(11,881)	(13,091)	(8,805)
Proceeds from sales of investment tax credits for redeemable noncontrolling interests and noncontrolling interests	5,971	—	—
Other, net	(6,998)	(802)	(476)
Net cash provided by financing activities	2,731,051	2,468,705	1,464,450
Net increase (decrease) in cash, cash equivalents and restricted cash	(51,172)	153,677	14,004
Cash, cash equivalents and restricted cash at beginning of period	545,574	391,897	377,893
Cash, cash equivalents and restricted cash at end of period	494,402	545,574	391,897
Restricted cash included in other current assets	(62,188)	(51,733)	(80,213)
Restricted cash included in other assets	(219,382)	(133,584)	(68,583)
Cash and cash equivalents at end of period	$ 212,832	$ 360,257	$ 243,101

	Year Ended December 31, 2023	2022	2021
Non-cash investing and financing activities:			
Change in accounts payable and accrued expenses related to purchases of property and equipment	$ 69,981	$ 32,008	$ (1,979)
Change in accounts payable and accrued expenses related to payments for investments and customer notes receivable	$ (24,025)	$ 31,908	$ 26,464
Note payable for financing the purchase of inventory	$ —	$ —	$ 32,301
Distributions payable to redeemable noncontrolling interests and noncontrolling interests	$ 187,940	$ 2,959	$ 3,215
Non-cash conversion of convertible senior notes for common stock	$ —	$ —	$ 95,648
Non-cash issuance of common stock for investments in solar receivables	$ —	$ —	$ 44,353
Non-cash issuance of common stock for business acquisition	$ —	$ —	$ 128,224
Supplemental cash flow information:			
Cash paid for interest	$ 283,985	$ 142,870	$ 88,256
Cash paid for income taxes	$ 14,726	$ 2,000	$ 190

See accompanying notes to consolidated financial statements.

SUNNOVA ENERGY INTERNATIONAL INC.
CONSOLIDATED STATEMENTS OF REDEEMABLE NONCONTROLLING INTERESTS AND EQUITY
(in thousands, except share amounts)

	Redeemable Noncontrolling Interests	Common Stock		Additional Paid-in Capital - Common Stock	Accumulated Deficit	Total Stockholders' Equity	Noncontrolling Interests	Total Equity
		Shares	Amount					
December 31, 2020	$ 136,124	100,412,036	$ 10	$ 1,482,716	$ (530,995)	$ 951,731	$ 192,826	$ 1,144,557
Cumulative-effect adjustment	—	—	—	—	2,254	2,254	—	2,254
Net income (loss)	6,991	—	—	—	(138,128)	(138,128)	(16,373)	(154,501)
Issuance of common stock, net	—	12,974,564	1	249,708	—	249,709	—	249,709
Equity component of debt instrument, net	—	—	—	(8,807)	—	(8,807)	—	(8,807)
Capped call transactions	—	—	—	(91,655)	—	(91,655)	—	(91,655)
Contributions from redeemable noncontrolling interests and noncontrolling interests	8,375	—	—	—	—	—	341,746	341,746
Distributions to redeemable noncontrolling interests and noncontrolling interests	(4,522)	—	—	—	—	—	(11,332)	(11,332)
Costs related to redeemable noncontrolling interests and noncontrolling interests	(447)	—	—	—	—	—	(10,902)	(10,902)
Equity in subsidiaries attributable to parent	(1,118)	—	—	—	207,153	207,153	(206,035)	1,118
Equity-based compensation expense	—	—	—	17,236	—	17,236	—	17,236
Other, net	(67)	—	—	1	1	2	(3,148)	(3,146)
December 31, 2021	145,336	113,386,600	11	1,649,199	(459,715)	1,189,495	286,782	1,476,277
Net income (loss)	(22,487)	—	—	—	(161,642)	(161,642)	53,853	(107,789)
Issuance of common stock, net	—	1,552,479	—	12,849	—	12,849	—	12,849
Capped call transactions	—	—	—	(48,420)	—	(48,420)	—	(48,420)
Contributions from redeemable noncontrolling interests and noncontrolling interests	84,923	—	—	—	—	—	364,475	364,475
Distributions to redeemable noncontrolling interests and noncontrolling interests	(4,920)	—	—	—	—	—	(24,851)	(24,851)
Costs related to redeemable noncontrolling interests and noncontrolling interests	(3,829)	—	—	—	—	—	(5,373)	(5,373)
Equity in subsidiaries attributable to parent	(33,020)	—	—	—	256,575	256,575	(223,555)	33,020
Equity-based compensation expense	—	—	—	24,218	—	24,218	—	24,218
Other, net	(266)	—	—	1	—	1	(2,694)	(2,693)
December 31, 2022	$ 165,737	114,939,079	$ 11	$ 1,637,847	$ (364,782)	$ 1,273,076	$ 448,637	$ 1,721,713

	Redeemable Noncontrolling Interests	Common Stock Shares	Common Stock Amount	Additional Paid-in Capital - Common Stock	Accumulated Deficit	Total Stockholders' Equity	Noncontrolling Interests	Total Equity
December 31, 2022	$ 165,737	114,939,079	$ 11	$ 1,637,847	$ (364,782)	$ 1,273,076	$ 448,637	$ 1,721,713
Net income (loss)	(8,443)	—	—	—	(417,961)	(417,961)	(76,022)	(493,983)
Issuance of common stock, net	—	7,527,436	1	92,079	—	92,080	—	92,080
Contributions from redeemable noncontrolling interests and noncontrolling interests	382,904	—	—	—	—	—	309,990	309,990
Distributions to redeemable noncontrolling interests and noncontrolling interests	(16,176)	—	—	—	—	—	(32,810)	(32,810)
Costs related to redeemable noncontrolling interests and noncontrolling interests	(8,257)	—	—	—	—	—	(6,302)	(6,302)
Equity in subsidiaries attributable to parent	(348,705)	—	—	—	554,160	554,160	(205,455)	348,705
Equity-based compensation expense	—	—	—	25,535	—	25,535	—	25,535
Other, net	(1,188)	—	—	—	—	—	(1,888)	(1,888)
December 31, 2023	$ 165,872	122,466,515	$ 12	$ 1,755,461	$ (228,583)	$ 1,526,890	$ 436,150	$ 1,963,040

See accompanying notes to consolidated financial statements.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(1) Description of Business and Basis of Presentation

We are an industry-leading energy services company focused on making clean energy more accessible, reliable and affordable for homeowners and businesses, serving over 419,000 customers in more than 45 United States ("U.S.") states and territories. Sunnova Energy Corporation was incorporated in Delaware on October 22, 2012 and formed Sunnova Energy International Inc. ("SEI") as a Delaware corporation on April 1, 2019. We completed our initial public offering on July 29, 2019 (our "IPO"); and in connection with our IPO, all of Sunnova Energy Corporation's ownership interests were contributed to SEI. Unless the context otherwise requires, references in this report to "Sunnova," the "Company," "we," "our," "us," or like terms, refer to SEI and its consolidated subsidiaries.

We partner with local dealers and contractors who originate, design and install our customers' solar energy systems, energy storage systems and related products and services on our behalf, as well as other sustainable home solutions, such as home security and monitoring, smart home devices, modern heating, ventilation and air conditioning, generators, upgraded roofing, water systems, water heaters, main panel upgrades and electric vehicle chargers. Our focus on our dealer and contractor model enables us to leverage our dealers' and contractors' specialized knowledge, connections and experience in local markets to drive customer origination while providing our dealers and contractors with access to high quality products at competitive prices, as well as technical oversight and expertise. We believe this structure provides operational flexibility, reduces exposure to labor shortages and lowers fixed costs relative to true vertically integrated models.

We offer customers products to power and improve the energy efficiency and sustainability of their homes and businesses with affordable solar energy and related products and services. We are able to offer energy generation savings compared to utility-based retail rates with little to no up-front expense to the customer in conjunction with solar and solar plus energy storage products, and, in the case of the latter, are able to also provide energy resiliency. Our customer agreements typically are structured as either a legal-form lease (a "lease") of a solar energy system and/or energy storage system to the customer, the sale of the solar energy system's output to the customer under a power purchase agreement ("PPA") or the purchase of a solar energy system, energy storage system and/or accessory either with financing provided by us (a "loan") or paid in full by the customer (a "sale"); however, we also offer service plans and repair services for systems we did not originate. We make it possible in some states for a customer to obtain a new roof and/or other ancillary products. We also allow customers originated through our homebuilder channel the option of purchasing the system when the customer closes on the purchase of a new home. The initial term of our customer agreements is typically between 10 and 25 years, during which time we provide or arrange for ongoing services to customers, including monitoring, maintenance and warranty services. Our lease and PPA agreements typically include an opportunity for customers to renew for up to an additional 10 years, via two five-year or one 10-year renewal options. Our ancillary products include both cash sales and loans with an initial term between one year and 20 years. Customer payments and rates can be fixed for the duration of the customer agreement or escalated at a pre-determined percentage annually. We also receive tax benefits and other incentives from leases and PPAs, a portion of which we finance through tax equity, non-recourse debt structures and hedging arrangements in order to fund our upfront costs, overhead and growth investments. Our future success depends in part on our ability to raise capital from third-party investors and commercial sources.

Basis of Presentation

The accompanying annual audited consolidated financial statements ("consolidated financial statements") include our consolidated balance sheets, statements of operations, statements of redeemable noncontrolling interests and equity and statements of cash flows and have been prepared in accordance with accounting principles generally accepted in the United States of America ("GAAP") from records maintained by us. Our consolidated financial statements include our accounts and those of our subsidiaries in which we have a controlling financial interest. In accordance with the provisions of the Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC") 810, *Consolidation*, we consolidate any VIE of which we are the primary beneficiary. We form VIEs with our investors in the ordinary course of business to facilitate the funding and monetization of certain attributes associated with our solar energy systems. The typical condition for a controlling financial interest is holding a majority of the voting interests of an entity. However, a controlling financial interest may also exist in entities, such as VIEs, through arrangements that do not involve holding a majority of the voting interests. A primary beneficiary is defined as the party that has (a) the power to direct the activities of a VIE that most significantly impact the VIE's economic performance and (b) the obligation to absorb losses or receive benefits from the VIE that could potentially be significant to the VIE. We do not consolidate a VIE in which we have a majority ownership interest when we are not considered the primary beneficiary. We have considered the provisions within the contractual arrangements that grant us power to manage and make decisions that affect the operation of our VIEs, including determining the solar energy systems contributed to the VIEs, and the installation, operation and maintenance of the solar energy systems. We consider the rights granted to the other investors under the contractual arrangements to be more protective in nature rather than substantive participating rights.

As such, we have determined we are the primary beneficiary of our VIEs and evaluate our relationships with our VIEs on an ongoing basis to determine whether we continue to be the primary beneficiary. We have eliminated all intercompany transactions in consolidation.

Reclassifications

Certain prior period amounts have been reclassified to conform to the current period presentation. These reclassifications did not have a significant impact on our consolidated financial statements.

(2) Significant Accounting Policies

Use of Estimates

The application of GAAP in the preparation of the consolidated financial statements requires us to make estimates and assumptions that affect the amounts reported in the consolidated financial statements and accompanying notes. We base our estimates on historical experience and on various other assumptions believed to be reasonable, the results of which form the basis for making judgments about the carrying values of assets and liabilities. Actual results could differ materially from those estimates.

Cash and Cash Equivalents

We maintain cash and cash equivalents, which consists principally of demand deposits, with investment-grade financial institutions. We are exposed to credit risk to the extent cash and cash equivalents balances exceed amounts covered by the Federal Deposit Insurance Corporation ("FDIC"). As of December 31, 2023 and 2022, we had cash and cash equivalents deposits of $187.0 million and $337.5 million, respectively, in excess of the FDIC's current insured limit of $250,000. We have not experienced any losses on our deposits of cash and cash equivalents.

Restricted Cash

We record cash that is restricted as to withdrawal or use under the terms of certain contractual agreements as restricted cash. Our restricted cash primarily represents cash held to service certain payments under the Sunnova EZ-Own Portfolio, LLC ("EZOP"), Sunnova TEP Holdings, LLC ("TEPH"), Helios II Issuer, LLC ("HELII"), Helios III Issuer, LLC ("HELIII"), Sunnova RAYS I Issuer, LLC ("RAYSI"), Sunnova Sol Issuer, LLC ("SOLI"), Sunnova Helios IV Issuer, LLC ("HELIV"), Sunnova Asset Portfolio 8, LLC ("AP8"), Sunnova Sol II Issuer, LLC ("SOLII"), Sunnova Helios V Issuer, LLC ("HELV"), Sunnova Helios VI Issuer, LLC ("HELVI"), Sunnova Helios VII Issuer, LLC ("HELVII"), Sunnova TEP V-A, LLC ("TEPVA"), Sunnova TEP V-B, LLC ("TEPVB"), Sunnova TEP V-C, LLC ("TEPVC"), Sunnova TEP 6-B, LLC ("TEP6B"), Sunnova TEP 6-D, LLC ("TEP6D"), Sunnova Sol III Issuer, LLC ("SOLIII"), Sunnova Helios VIII Issuer, LLC ("HELVIII"), Sunnova Helios IX Issuer, LLC ("HELIX"), Sunnova Sol IV Issuer, LLC ("SOLIV"), Sunnova Helios X Issuer, LLC ("HELX"), Sunnova Sol V Issuer, LLC ("SOLV"), Sunnova Helios XI Issuer, LLC ("HELXI"), Sunnova Helios XII Issuer, LLC ("HELXII"), Sunnova TEP 7-A, LLC ("TEP7A"), Sunnova TEP 7-B, LLC ("TEP7B"), Sunnova TEP 7-C, LLC ("TEP7C"), Sunnova TEP 7-D, LLC ("TEP7D"), Sunnova TEP 7-E, LLC ("TEP7E"), Sunnova TEP 7-F, LLC ("TEP7F"), Sunnova TEP 7-G, LLC ("TEP7G"), Sunnova TEP 8-C, LLC ("TEP8C"), Sunnova Inventory Supply, LLC ("IS"), Sunnova Asset Portfolio 9, LLC ("AP9") and Sunnova Hestia I Issuer, LLC ("HESI") financing arrangements (see Note 9, Long-Term Debt and Note 13, Redeemable Noncontrolling Interests and Noncontrolling Interests) and balances collateralizing outstanding letters of credit related to a reinsurance agreement and one of our operating leases for office space (see Note 17, Commitments and Contingencies). The following table presents the detail of restricted cash as recorded in other current assets and other assets in the consolidated balance sheets:

	As of December 31,	
	2023	2022
	(in thousands)	
Debt and inverter reserves	$ 247,394	$ 132,634
Tax equity reserves	25,778	46,684
Other	8,398	5,999
Total (1)	$ 281,570	$ 185,317

(1) Of this amount, $62.2 million and $51.7 million is recorded in other current assets as of December 31, 2023 and 2022, respectively.

We are exposed to credit risk to the extent restricted cash balances exceed amounts covered by the FDIC. As of December 31, 2023 and 2022, we had restricted cash deposits of $274.4 million and $179.8 million, respectively, in excess of the FDIC's current insured limit of $250,000. We have not experienced any losses on our deposits of restricted cash.

Accounts Receivable

Accounts Receivable—Trade. Accounts receivable—trade primarily represents trade receivables from customers that are generally collected in the subsequent month. Accounts receivable—trade is recorded net of an allowance for credit losses, which is based on our assessment of the collectability of customer accounts based on the best available data at the time. We review the allowance by considering factors such as historical experience, customer credit rating, contractual term, aging category and current economic conditions that may affect a customer's ability to pay to identify customers with potential disputes or collection issues. We write off accounts receivable when we deem them uncollectible. The following table presents the changes in the allowance for credit losses recorded against accounts receivable—trade, net in the consolidated balance sheets:

	Year Ended December 31,	
	2023	2022
	(in thousands)	
Balance at beginning of period	$ 1,676	$ 1,044
Provision for current expected credit losses	4,978	2,858
Write off of uncollectible accounts	(4,370)	(2,490)
Recoveries	275	264
Balance at end of period	$ 2,559	$ 1,676

Accounts Receivable—Other. Accounts receivable—other primarily represents receivables from ITC sales and receivables from our dealers or other parties related to the sale of inventory and the use of inventory procured by us. The following table presents the changes in the allowance for credit losses recorded against accounts receivable—other in the consolidated balance sheets:

	Year Ended December 31,	
	2023	2022
	(in thousands)	
Balance at beginning of period	$ —	$ —
Provision for current expected credit losses	18,402	—
Write off of uncollectible accounts	(5,357)	—
Balance at end of period	$ 13,045	$ —

Inventory

Inventory is stated at the lower of cost and net realizable value using the first-in, first-out method. Inventory primarily represents (a) raw materials, such as energy storage systems, photovoltaic modules, inverters, meters and modems, (b) homebuilder construction in progress and (c) other associated equipment purchased. These materials are typically procured by us and used by our dealers, sold to our dealers or held for use as original parts on new solar energy systems or replacement parts on existing solar energy systems. We remove these items from inventory and record the transaction in typically one of these manners: (a) expense to operations and maintenance expense when installed as a replacement part for a solar energy system, (b) recognize in accounts receivable—other when procured by us and used by our dealers, (c) expense to cost of revenue—inventory sales if sold directly to a dealer or other party, (d) capitalize to property and equipment when installed on an existing home or business or (e) capitalize to property and equipment when placed in service under the homebuilder program. We periodically evaluate our inventory for unusable and obsolete items based on assumptions about future demand and market conditions. Based on this evaluation, provisions are made to write inventory down to net realizable value. The following table presents the detail of inventory as recorded in other current assets in the consolidated balance sheets:

	As of December 31,	
	2023	2022
	(in thousands)	
Energy storage systems and components	$ 83,178	$ 74,968
Homebuilder construction in progress	36,461	43,116
Modules and inverters	27,143	32,798
Meters and modems	1,793	1,166
Other	—	65
Total	$ 148,575	$ 152,113

Concentrations of Risk

Financial instruments that potentially subject us to concentrations of credit risk consist primarily of cash, cash equivalents, restricted cash, accounts receivable and notes receivable. The concentrated risk associated with cash, cash equivalents and restricted cash is mitigated by our policy of banking with creditworthy institutions. Typically, amounts on deposit with certain banking institutions exceed FDIC insurance limits. We do not generally require collateral or other security to support accounts receivable. To reduce credit risk related to our relationship with our dealers, management performs periodic credit evaluations and ongoing assessments of our dealers' financial condition.

Concentration of Services and Equipment from Dealers

We utilize a network of approximately 475 dealers as of December 31, 2023. During the year ended December 31, 2023, two dealers accounted for approximately 20% and 16%, respectively, of our total expenditures to dealers. During the year ended December 31, 2022, three dealers accounted for approximately 26%, 16% and 11%, respectively, of our total expenditures to dealers. During the year ended December 31, 2021, two dealers accounted for approximately 28% and 13%, respectively, of our total expenditures to dealers. No other dealer accounted for more than 10% of our expenditures to dealers during the years ended December 31, 2023, 2022 and 2021.

Concentration of Revenue from Dealers

During the year ended December 31, 2023, one dealer accounted for approximately 16% of our total revenue. During the year ended December 31, 2022, one dealer accounted for approximately 16% of our total revenue. No other dealer accounted for more than 10% of our revenue during the years ended December 31, 2023, 2022 and 2021.

Dealer Commitments

We enter into exclusivity and other similar agreements with certain key dealers pursuant to which we agree to pay an incentive if such dealers install a certain minimum number of solar energy systems within specified periods. These incentives are recorded in other assets in the consolidated balance sheets and are amortized to general and administrative expense in the consolidated statements of operations generally over the term of the customer agreements, which is estimated at an average of 23 years. See Note 17, Commitments and Contingencies.

Fair Value of Financial Instruments

Fair value is an exit price representing the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. As such, fair value is a market-based measurement that should be determined based on assumptions market participants would use in pricing an asset or a liability. Valuation techniques used to measure fair value must maximize the use of observable inputs and minimize the use of unobservable inputs. ASC 820 establishes a three-tier fair value hierarchy, which prioritizes inputs that may be used to measure fair value as follows:

- Level 1—Observable inputs that reflect unadjusted quoted market prices in active markets for identical assets or liabilities that are accessible at the measurement date.

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

In certain cases, the inputs used to measure fair value may fall into different levels of the fair value hierarchy. In such cases, the level in the fair value hierarchy must be determined based on the lowest level input that is significant to the fair value measurement. An assessment of the significance of a particular input to the fair value measurement in its entirety requires judgment and consideration of factors specific to the asset or liability. Our financial instruments include cash, cash equivalents, accounts receivable, customer notes receivable, investments in solar receivables, accounts payable, accrued expenses, long-term debt, interest rate swaps and caps and contingent consideration. The carrying values of accounts receivable, accounts payable and accrued expenses approximate the fair values due to the fact that they are short-term in nature (Level 1). We estimate the fair value of our customer notes receivable based on interest rates currently offered under the loan program with similar maturities and terms (Level 3). We estimate the fair value of our investments in solar receivables based on a discounted cash flows model that utilizes market data related to solar irradiance, production factors by region and projected electric utility rates in order to build up revenue projections (Level 3). In addition, lease-related revenue and maintenance and service costs were supported through the use of available market studies and data. We estimate the fair value of our fixed-rate long-term debt based on an analysis of debt with similar book values, maturities and required market yields based on current interest rates (Level 3). We determine the fair values of the interest rate derivative transactions based on a discounted cash flow method using contractual terms of the transactions and counterparty credit risk as key inputs. The floating interest rate is based on observable rates consistent with the frequency of the interest cash flows (Level 2). For contingent consideration, we estimate the fair value of the installation earnout using the Monte Carlo model based on the forecasted placements for the installations and the microgrid earnout using a scenario-based methodology based on the probabilities of the microgrid earnout, both using Level 3 inputs. See Note 7, Customer Notes Receivable, Note 8, Investments in Solar Receivables, Note 9, Long-Term Debt, Note 10, Derivative Instruments and Note 12, Acquisitions.

The following tables present our financial instruments measured at fair value on a recurring basis as of December 31, 2023 and 2022:

	As of December 31, 2023			
	Total	Level 1	Level 2	Level 3
	(in thousands)			
Financial assets:				
Investments in solar receivables	$ 69,334	$ —	$ —	$ 69,334
Derivative assets	55,471	—	55,471	—
Total	$ 124,805	$ —	$ 55,471	$ 69,334
Financial liabilities:				
Contingent consideration	$ 19,916	$ —	$ —	$ 19,916
Total	$ 19,916	$ —	$ —	$ 19,916

	As of December 31, 2022			
	Total	Level 1	Level 2	Level 3
	(in thousands)			
Financial assets:				
Investments in solar receivables	$ 72,171	$ —	$ —	$ 72,171
Derivative assets	112,712	—	112,712	—
Total	$ 184,883	$ —	$ 112,712	$ 72,171
Financial liabilities:				
Contingent consideration	$ 26,787	$ —	$ —	$ 26,787
Total	$ 26,787	$ —	$ —	$ 26,787

Changes in the fair value of our investments in solar receivables are included in other operating income/expense in the consolidated statements of operations. The following table summarizes the change in the fair value of our financial assets accounted for at fair value on a recurring basis using Level 3 inputs as recorded in other current assets and other assets (see Note 5, Detail of Certain Balance Sheet Captions) in the consolidated balance sheets:

	Year Ended December 31,	
	2023	2022
	(in thousands)	
Balance at beginning of period	$ 72,171	$ 82,658
Additions	969	—
Settlements	(11,528)	(11,581)
Gain recognized in earnings	7,722	1,094
Balance at end of period	$ 69,334	$ 72,171

Changes in the fair value of our contingent consideration are included in other operating expense/income in the consolidated statements of operations. The following table summarizes the change in the fair value of our financial liabilities accounted for at fair value on a recurring basis using Level 3 inputs as recorded in other long-term liabilities in the consolidated balance sheets:

	Year Ended December 31,	
	2023	2022
	(in thousands)	
Balance at beginning of period	$ 26,787	$ 67,895
Settlements	(10,832)	(16,014)
(Gain) loss recognized in earnings	3,961	(25,094)
Balance at end of period	$ 19,916	$ 26,787

The following table summarizes the significant unobservable inputs used in the valuation of our liabilities as of December 31, 2023 using Level 3 inputs:

	Unobservable Input	Weighted Average
Liabilities:		
Contingent consideration - installation earnout	Volatility	30.00%
	Revenue risk premium	15.90%
	Risk-free discount rate	4.65%
Contingent consideration - microgrid earnout	Probability of success	10.00%
	Risk-free discount rate	4.65%

Significant increases or decreases in the volatility, revenue risk premium, probability of success or risk-free discount rate in isolation could result in a significantly higher or lower fair value measurement.

Derivative Instruments

Our derivative instruments consist of interest rate swaps and caps that are not designated as cash flow hedges or fair value hedges. We use interest rate swaps and caps to manage our net exposure to interest rate changes. We record the derivatives in other current assets, other assets, other current liabilities and other long-term liabilities, as appropriate, in the consolidated balance sheets and the changes in fair value are recorded in interest expense, net in the consolidated statements of operations. We include unrealized gains and losses on derivatives as a non-cash reconciling item in operating activities in the consolidated statements of cash flows. We include realized gains and losses on derivatives as a change in components of operating assets and liabilities in operating activities in the consolidated statements of cash flows. See Note 10, Derivative Instruments.

Revenue

The following table presents the detail of revenue as recorded in the consolidated statements of operations:

	Year Ended December 31,		
	2023	2022	2021
		(in thousands)	
PPA revenue	$ 123,646	$ 104,563	$ 86,087
Lease revenue	147,788	100,070	71,784
Inventory sales revenue	185,855	195,979	—
Service revenue	16,197	4,178	2,049
Direct sales revenue	60,590	8,484	1,212
Solar renewable energy certificate revenue	50,375	48,698	41,537
Cash sales revenue	96,072	72,425	27,176
Loan revenue	34,716	18,601	7,768
Other revenue	5,414	4,692	4,139
Total	$ 720,653	$ 557,690	$ 241,752

We recognize revenue from contracts with customers as we satisfy our performance obligations at a transaction price reflecting an amount of consideration based upon an estimated rate of return, net of cash incentives. We express this rate of return as the solar rate per kilowatt hour ("kWh") in the customer contract. The amount of revenue we recognize does not equal customer cash payments because we satisfy performance obligations ahead of cash receipt or evenly as we provide continuous access on a stand-ready basis to the solar energy system. We reflect the differences between revenue recognition and cash payments received in accounts receivable, other assets or deferred revenue, as appropriate. Revenue allocated to remaining performance obligations represents contracted revenue we have not yet recognized and includes deferred revenue as well as amounts that will be invoiced and recognized as revenue in future periods. Contracted but not yet recognized revenue was approximately $5.4 billion as of December 31, 2023, of which we expect to recognize approximately 4% over the next 12 months. We do not expect the annual recognition to vary significantly over approximately the next 20 years as the vast majority of existing customer agreements have at least 20 years remaining, given the average age of the fleet of solar energy systems under contract is less than four years.

Certain customers may receive cash incentives. We defer recognition of the payment of these cash incentives and recognize them over the life of the contract as a reduction to revenue. The deferred payment is recorded in other assets for customers who receive the cash incentives under our lease and PPA agreements, and as a contra-liability in other long-term liabilities for customers who receive the cash incentives under our loan agreements.

PPAs. Customers purchase electricity from us under PPAs. Pursuant to ASC 606, we recognize revenue based upon the amount of electricity delivered as determined by remote monitoring equipment at solar rates specified under the PPAs. All customers must pass our credit evaluation process. The PPAs generally have a term of 20 or 25 years with an opportunity for customers to renew for up to an additional 10 years, via two five-year or one 10-year renewal options.

Leases. We are the lessor under lease agreements for solar energy systems and energy storage systems, which do not meet the definition of a lease under ASC 842 and are accounted for as contracts with customers under ASC 606. We recognize revenue on a straight-line basis over the contract term as we satisfy our obligation to provide continuous access to the solar energy system. All customers must pass our credit evaluation process. The lease agreements generally have a term of 20 or 25 years with an opportunity for customers to renew for up to an additional 10 years, via two five-year or one 10-year renewal options.

In most cases, we provide customers under our lease agreements a performance guarantee that each solar energy system will achieve a certain specified minimum solar energy production output, which is a significant proportion of its expected output. The specified minimum solar energy production output may not be achieved due to natural fluctuations in the weather or equipment failures from exposure and wear and tear outside of our control, among other factors. We determine the amount of the guaranteed output based on a number of different factors, including: (a) the specific site information related to the tilt of the panels, azimuth (a horizontal angle measured clockwise in degrees from a reference direction) of the panels, size of the system, and shading on site; (b) the calculated amount of available irradiance (amount of energy for a given flat surface facing a specific direction) based on historical average weather data and (c) the calculated amount of energy output of the solar energy system. While actual irradiance levels can significantly change year over year due to natural fluctuations in the weather, we expect the levels to average out over the term of a lease and to approximate the levels used in determining the amount of the performance guarantee. Generally, weather fluctuations are the most likely reason a solar energy system may not achieve a certain specified minimum solar energy production output.

If the solar energy system does not produce the guaranteed production amount, we are required to refund a portion of the previously remitted customer payments, where the repayment is calculated as the product of (a) the shortfall production amount and (b) the dollar amount (guaranteed rate) per kWh that is fixed throughout the term of the contract. These remittances of a customer's payments, if needed, are payable as early as the first anniversary of the solar energy system's placed in service date and then every annual period thereafter. See Note 17, Commitments and Contingencies.

Inventory Sales. Inventory sales revenue represents revenue from the direct sale of inventory to our dealers or other parties. We recognize the related revenue under ASC 606 upon shipment or upon sale when a bill and hold agreement is in place. Shipping and handling costs are included in cost of revenue—inventory sales in the consolidated statements of operations.

Service Revenue. Service revenue includes sales of service plans and repair services. Service plans are available to customers whose solar energy system was not originally sold by Sunnova. We recognize revenue from service plan contracts on a straight-line basis over the life of the contract, which is typically 10 years. We recognize revenue from repair services in the period in which the service was performed.

Direct Sales Revenue. Direct sales revenue includes revenue from the direct sale of solar energy systems and energy storage systems to customers with financing provided by us. We recognize revenue from the direct sale of solar energy systems and energy storage systems in the period in which the systems are placed in service.

Solar Renewable Energy Certificates. Each solar renewable energy certificate ("SREC") represents the environmental benefit of one megawatt hour (1,000 kWh) generated by a solar energy system. SRECs can be sold separate from the actual electricity generated by the renewable-based generation source. We account for the SRECs we generate from our solar energy systems as governmental incentives with no costs incurred to obtain them and do not consider those SRECs output of the underlying solar energy systems. We classify these SRECs as inventory held until sold and delivered to third parties. As we did not incur costs to obtain these governmental incentives, the inventory carrying value for the SRECs was $0 as of December 31, 2023 and 2022. We enter into economic hedges related to expected production of SRECs through forward contracts. While these fixed price forward contracts serve as an economic hedge against spot price fluctuations for the SRECs, the contracts do not qualify for hedge accounting and are not designated as cash flow hedges or fair value hedges. The contracts require us to physically deliver the SRECs upon settlement. We recognize the related revenue under ASC 606 upon satisfaction of the performance obligation to transfer the SRECs to the stated counterparty. Payments are typically received within one month of transferring the SREC to the counterparty. The costs related to the sales of SRECs are generally limited to broker fees (recorded in cost of revenue—other), which are only paid in connection with certain transactions. In certain circumstances we are required to purchase SRECs on the open market to fulfill minimum delivery requirements under our forward contracts.

Cash Sales. Cash sales revenue represents revenue from a customer's purchase of a solar energy system from us typically when purchasing a new home. We recognize the related revenue under ASC 606 upon verification of the home closing.

Loans. See discussion of loan revenue in the "*Loans*" section below.

Other Revenue. Other revenue includes certain state and utility incentives. We recognize revenue from state and utility incentives in the periods in which they are earned.

Loans

We offer a loan program, under which the customer finances the purchase of a solar energy system, energy storage system and/or accessory through a customer agreement, typically for a term of 10, 15 or 25 years. We recognize cash payments received from customers on a monthly basis under our loan program (a) as interest income, to the extent attributable to earned interest on the contract that financed the customer's purchase; (b) as a reduction of a note receivable on the balance sheet, to the extent attributable to a return of principal (whether scheduled or prepaid) on the contract that financed the customer's purchase; and (c) as revenue, to the extent attributable to payments for operations and maintenance services provided by us. To qualify for the loan program, a customer must pass our credit evaluation process, which requires the customer to have a minimum FICO®

score of 600 to 710 depending on certain circumstances, and we secure the loans with the solar energy systems, energy storage systems or accessories financed. The credit evaluation process is performed once for each customer at the time the customer is entering into the customer agreement with us.

Our investments in solar energy systems, energy storage systems and accessories related to the loan program that are not yet placed in service are recorded in other assets in the consolidated balance sheets and are transferred to customer notes receivable upon being placed in service. Customer notes receivable are recorded at amortized cost, net of an allowance for credit losses (as described below), in other current assets and customer notes receivable in the consolidated balance sheets. Accrued interest receivable related to our customer notes receivable is recorded in accounts receivable—trade, net in the consolidated balance sheets. Interest income from customer notes receivable is recorded in interest income in the consolidated statements of operations. The amortized cost of our customer notes receivable is equal to the principal balance of customer notes receivable outstanding and does not include accrued interest receivable. Customer notes receivable continue to accrue interest until they are written off against the allowance, which occurs when the balance is 180 days or more past due unless the balance is in the process of collection. Customer notes receivable are considered past due one day after the due date based on the contractual terms of the loan agreement. In all cases, customer notes receivable balances are placed on a nonaccrual status or written off at an earlier date when they are deemed uncollectible. Expected recoveries do not exceed the aggregate of amounts previously written off and expected to be written off. Accrued interest receivable for customer notes receivable placed on a nonaccrual status is recorded as a reduction to interest income. Interest received on such customer notes receivable is accounted for on a cash basis until the customer notes receivable qualifies for the return to accrual status. Customer notes receivable are returned to accrual status when there is no longer any principal or interest amounts past due and future payments are reasonably assured.

The allowance for credit losses is deducted from the customer notes receivable amortized cost to present the net amount expected to be collected. It is measured on a collective (pool) basis when similar risk characteristics (such as financial asset type, customer credit rating, contractual term and vintage) exist. In determining the allowance for credit losses, we identify customers with potential disputes or collection issues and consider our historical level of credit losses and current economic trends that might impact the level of future credit losses. Adjustments to historical loss information are made for differences in current loan-specific risk characteristics, such as differences in underwriting standards. Expected credit losses are estimated over the contractual term of the loan agreements based on the best available data at the time and adjusted for expected prepayments when appropriate. The contractual term excludes expected extensions, renewals and modifications unless either of the following applies: (a) we have a reasonable expectation at the reporting date that a troubled debt restructuring will be executed with an individual customer or (b) the extension or renewal options are included in the original or modified contract at the reporting date and are not unconditionally cancelable by us. Expected credit losses are recorded in general and administrative expense in the consolidated statements of operations. See Note 7, Customer Notes Receivable.

Deferred Revenue

Deferred revenue consists of amounts for which the criteria for revenue recognition have not yet been met and includes (a) payments for unfulfilled performance obligations that will be recognized on a straight-line basis over the remaining term of the respective customer agreements, net of any cash incentives earned by the customers, (b) down payments and partial or full prepayments from customers and (c) differences due to the timing of energy production versus billing for certain types of PPAs. Deferred revenue was $297.8 million as of December 31, 2021. The following table presents the detail of deferred revenue as recorded in other current liabilities and other long-term liabilities in the consolidated balance sheets:

	As of December 31,	
	2023	2022
	(in thousands)	
Loans	$ 930,999	$ 586,128
PPAs and leases	55,651	24,893
Solar receivables	4,339	4,602
Other	14	—
Total (1)	$ 991,003	$ 615,623

(1) Of this amount, $50.8 million and $30.2 million is recorded in other current liabilities as of December 31, 2023 and 2022, respectively.

During the years ended December 31, 2023 and 2022, we recognized revenue of $33.0 million and $16.0 million, respectively, from amounts recorded in deferred revenue at the beginning of the respective years.

Contract Assets and Contract Liabilities

Billing practices are governed by the contract terms of each project based upon costs incurred, production or predetermined schedules. Billings do not necessarily correlate with revenue recognized using the percentage-of-completion method to reflect the transfer of control over time. Contract assets include unbilled amounts typically resulting from revenue under contracts when the percentage-of-completion method of revenue recognition is utilized and revenue recognized exceeds the amount billed to the customer. Contract liabilities consist of advance payments and billings in excess of revenue recognized. Retainage, included in contract assets, represents the amounts withheld from billings by our clients pursuant to provisions in the contracts and may not be paid to us until the completion of specific tasks or the completion of the project and, in some instances, for even longer periods. Retainage may also be subject to restrictive conditions such as performance guarantees. Our contract assets and liabilities are reported in a net position on a contract-by-contract basis at the end of each reporting period. The payment terms of our contracts from time to time require the customer to make advance payments as well as interim payments as work progresses. As of December 31, 2023 and 2022, contract assets were $279,000 and $0, respectively, and contract liabilities were $3.8 million and $0, respectively. The increase in contract assets was primarily attributed to revenue recognized on certain contracts partially offset by the timing of billings. The increase in contract liabilities was due to the timing of advance payments partially offset by revenue recognized during the period. During the years ended December 31, 2023 and 2022, we recognized revenue of $0 from amounts recorded in contract liabilities at the beginning of the respective years.

Performance Guarantee Obligations

In most cases, we guarantee certain specified minimum solar energy production output under our leases and loan agreements, generally over a term between 10 and 25 years. The amounts are generally measured and credited to the customer's account as early as the first anniversary of the solar energy system's placed in service date and then every annual period thereafter. We monitor the solar energy systems to ensure these outputs are achieved. We evaluate if any amounts are due to our customers based upon not meeting the guaranteed solar energy production outputs at each reporting period end. For leases, these estimated amounts are recorded as a reduction to revenues from customers and a current or long-term liability, as applicable. For loans, these estimated amounts are recorded as an increase to cost of revenue—other and a current or long-term liability, as applicable. See Note 17, Commitments and Contingencies.

Property and Equipment

Solar Energy Systems and Energy Storage Systems. Depreciation and amortization of solar energy systems and energy storage systems are calculated using the straight-line method over the estimated useful lives of the solar energy systems and energy storage systems and are recorded in cost of revenue—depreciation. While solar energy systems and energy storage systems are in the design, construction and installation stages prior to being placed in service, the development of the systems is accounted for through construction in progress. The components of the design, construction and installation of the solar energy systems and energy storage systems are as follows:

- Dealer's costs (engineering, procurement and construction)
- Direct costs (costs directly related to a solar energy system or energy storage system)
- Indirect costs (costs incurred in the design, construction and installation of the solar energy system or energy storage system but not directly associated with a particular asset)

Solar energy systems and energy storage systems are carried at the cost of acquisition or construction (including design and installation) less certain utility rebates and are depreciated over the useful lives of the assets. Depreciation begins when a solar energy system or energy storage system is placed in service. Costs associated with repair and maintenance of a solar energy system or energy storage system are expensed as incurred. Costs associated with improvements to a solar energy system or energy storage system, which extend the life, increase the capacity or improve the efficiency of the systems, are capitalized and depreciated over the remaining life of the asset.

Property and Equipment, Excluding Solar Energy Systems and Energy Storage Systems. Property and equipment, including information technology system projects, computers and equipment, leasehold improvements, furniture and fixtures, vehicles and other property and equipment are stated at cost, less accumulated depreciation and amortization. Depreciation and amortization are calculated using the straight-line method over the estimated useful lives of the respective assets and are recorded in general and administrative expense. Leasehold improvements are amortized over the shorter of the lease term or the estimated useful lives. Upon disposition, the cost and related accumulated depreciation of the assets are removed from property and equipment and the resulting gain or loss is reflected in the consolidated statements of operations. Repair and maintenance costs are expensed as incurred.

Acquisitions

Business combinations are accounted for using the acquisition method of accounting in accordance with ASC 805, *Business Combinations*, as amended by Accounting Standards Update ("ASU") No. 2017-01, *Business Combinations: Clarifying the Definition of a Business*. The purchase price of an acquisition is measured at the estimated fair value of the assets acquired, equity instruments issued and liabilities assumed at the acquisition date. Any noncontrolling interests acquired are also initially measured at fair value. Costs that are directly attributable to the acquisition are expensed as incurred to general and administrative expense. We recognize goodwill if the aggregate fair value of the total purchase consideration and the noncontrolling interests is in excess of the aggregate fair value of the assets acquired and liabilities assumed. We may engage third-party valuation firms to assist in determining the fair values. The operating results of an acquired business are included in our results of operations from the date of acquisition. We have up to one year from the acquisition date to complete the fair value purchase price allocation. See Note 12, Acquisitions.

Asset acquisitions are measured based on the cost to us, including transaction costs. Asset acquisition costs, or the consideration transferred by us, are assumed to be equal to the fair value of the net assets acquired. If the consideration transferred is cash, measurement is based on the amount of cash we paid to the seller, as well as transaction costs incurred. Consideration given in the form of non-monetary assets, liabilities incurred or equity instruments issued is measured based on either the cost to us or the fair value of the assets or net assets acquired, whichever is more clearly evident. The cost of an asset acquisition is allocated to the assets acquired based on their estimated fair values. Goodwill is not recognized in an asset acquisition.

Intangibles

Our purchased intangible assets are stated at cost less accumulated amortization. Our intangible assets acquired from a business combination or asset acquisition are stated at the estimated fair value on the date of the acquisition less accumulated amortization (see Note 12, Acquisitions). We amortize intangible assets to general and administrative expense using the straight-line method. The following table presents the detail of intangible assets as recorded in other assets in the consolidated balance sheets:

		As of December 31,	
	Useful Lives	**2023**	**2022**
	(in years)	**(in thousands)**	
Customer relationships - system sales	10	$ 145,496	$ 145,496
Customer relationships - servicing	10	3,471	3,471
Customer relationships - new customers	4	29,761	29,761
Trade name	15	11,899	11,899
Tax equity commitment	4	21,209	21,209
Software license	3	331	331
Trademark	3	68	68
Other	3-25	499	521
Intangible assets, gross		212,734	212,756
Less: accumulated amortization		(78,676)	(50,244)
Intangible assets, net		$ 134,058	$ 162,512

As of December 31, 2023, amortization expense related to intangible assets to be recognized is as follows:

	Amortization Expense
	(in thousands)
2024	$ 28,450
2025	18,893
2026	15,707
2027	15,707
2028	15,707
2029 and thereafter	39,594
Total	$ 134,058

Goodwill

Goodwill represents the excess of the purchase price over the fair value of assets acquired and liabilities assumed. Goodwill is reviewed for impairment at least annually or whenever events or changes in circumstances indicate the carrying amount may be impaired. When assessing goodwill for impairment, we use qualitative and if necessary, quantitative methods in accordance with GAAP. Our annual assessment date is October 31. We utilized a qualitative assessment and concluded it was more likely than not the carrying amount was greater than the fair value due to a sustained decline in our share price. Our review considered performance compared to released guidance, renewable market factors, liquidity and market capitalization including stock price along with other market factors including interest rate changes and inflation. Based on this assessment, we performed a quantitative assessment using the market approach. Our market capitalization, after consideration of a control premium, was lower than the book value of equity and thus, we recognized goodwill impairment of $13.2 million in the fourth quarter of 2023.

Deferred Financing Costs

Deferred financing costs are capitalized and amortized to interest expense, net over the term of the related debt using the effective interest method for term loans or the straight-line method for revolving credit facilities. The unamortized balance of deferred financing costs is recorded in current portion of long-term debt, current portion of long-term debt—affiliates, long-term debt, net and long-term debt, net—affiliates (see Note 9, Long-Term Debt) for term loans or in other current assets and other assets for revolving credit facilities and debt and equity transactions not yet completed, in the consolidated balance sheets. The following table presents the changes in net deferred financing costs:

	Year Ended December 31,	
	2023	2022
	(in thousands)	
Balance at beginning of period	$ 76,525	$ 56,056
Capitalized	77,062	34,109
Amortized	(25,226)	(13,640)
Balance at end of period	$ 128,361	$ 76,525

Asset Retirement Obligation ("ARO")

We have AROs arising from contractual requirements to perform certain asset retirement activities at the time the solar energy systems are disposed. We recognize an ARO at the point an obligating event takes place, typically when the solar energy system is placed in service. An asset is considered retired when it is permanently taken out of service, such as through a sale or disposal.

The liability is initially measured at fair value (as a Level 3 measurement) based on the present value of estimated removal and restoration costs and subsequently adjusted for changes in the underlying assumptions and for accretion expense. The accretion expense is recognized in general and administrative expense in the consolidated statements of operations. The corresponding asset retirement costs are capitalized as part of the carrying amount of the solar energy system and depreciated over the solar energy system's remaining useful life. See Note 6, AROs.

Warranty Obligations

In connection with our customer agreements, we warrant the solar energy systems against defects in workmanship, against component or materials breakdowns and against any damages to rooftops during the installation process. The dealers' warranties on the workmanship, including work during the installation process, and the manufacturers' warranties over component parts have a range of warranty periods which are generally 10 to 25 years. As of December 31, 2023 and 2022, a warranty reserve of $6.0 million and $3.0 million, respectively, is recorded in other long-term liabilities in the consolidated balance sheets.

Advertising Costs

We expense advertising costs as they are incurred to general and administrative expense in the consolidated statements of operations. We recognized advertising expense of $5.0 million, $2.5 million and $1.9 million during the years ended December 31, 2023, 2022 and 2021, respectively.

Defined Contribution Plan

In April 2015, we established the Sunnova Energy Corporation 401(k) Profit Sharing Plan ("401(k) plan") available to employees who meet the 401(k) plan's eligibility requirements. The 401(k) plan allows participants to contribute a percentage of their compensation to the 401(k) plan up to the limits set forth in the Internal Revenue Code. We may make additional discretionary contributions to the 401(k) plan as a percentage of total participant contributions, subject to established limits. Participants are fully vested in their contributions and any safe harbor matching contributions we make. We made safe harbor matching contributions of $4.2 million, $1.8 million and $1.3 million during the years ended December 31, 2023, 2022 and 2021, respectively, which are recorded in general and administrative expense in the consolidated statements of operations.

Income Taxes

We account for income taxes under an asset and liability approach. Deferred income taxes reflect the impact of temporary differences between assets and liabilities recognized for financial reporting purposes and the amounts recognized for income tax reporting purposes, net operating loss, carryforwards, and other tax credits measured by applying currently enacted tax laws. A valuation allowance is provided when necessary to reduce deferred tax assets to an amount that is more likely than not to be realized.

We determine whether a tax position taken in a filed tax return, planned to be taken in a future tax return or claim, or otherwise subject to interpretation, is more likely than not to be sustained upon examination, including resolution of any related appeals or litigation processes, based on the technical merits of the position, or prospectively approved when such approval may be sought in advance. We use a two-step approach to recognize and measure uncertain tax positions. The first step is to evaluate the tax position for recognition by determining if the available evidence indicates it is more likely than not the position will be sustained upon tax authority examination, including resolution of related appeals or litigation processes, if any. The second step is to measure the tax benefit or obligation as the largest amount that is more than 50% likely of being realized upon ultimate settlement. See Note 11, Income Taxes.

Comprehensive Income (Loss)

We are required to report comprehensive income (loss), which includes net income (loss) as well as other comprehensive income (loss). There were no differences between comprehensive loss and net loss as reported in the consolidated statements of operations for the periods presented.

Impairment of Long-Lived Assets

Long-lived assets, such as property and equipment, are reviewed for impairment whenever events or changes in circumstances indicate the carrying amount of an asset may not be recoverable. If circumstances require a long-lived asset be tested for possible impairment, we first compare undiscounted cash flows expected to be generated by that asset or asset group to its carrying value. If the carrying value of the long-lived asset or asset group is not recoverable on an undiscounted cash flow basis, impairment is recognized to the extent the carrying value exceeds its fair value. Fair value is determined through various valuation techniques including discounted cash flow models, quoted market values and third-party independent appraisals as considered necessary. Impairment charges are recorded in operations and maintenance expense for solar energy systems that relate to revenue from contracts with customers and general and administrative expense for all other property and equipment and other long-lived assets.

Segment Information

Operating segments are defined as components of a company about which separate financial information is available that is evaluated regularly by the chief operating decision maker, or decision-making group, in deciding how to allocate resources and in assessing performance. Our chief operating decision maker is the chief executive officer. Based on the financial information presented to and reviewed by our chief operating decision maker in deciding how to allocate resources and in assessing performance, we have determined we have a single reportable segment: solar energy products and services. Our principal operations, revenue and decision-making functions are located in the U.S.

Basic and Diluted Net Income (Loss) Per Share

Our basic net income (loss) per share attributable to stockholders is calculated by dividing the net income (loss) attributable to stockholders by the weighted-average number of shares of common stock outstanding for the period. Our diluted net income (loss) per share attributable to stockholders is calculated by giving effect to all potential common stock equivalents outstanding for the period determined using the treasury stock method or the if-converted method, as applicable. During periods in which we incur a net loss attributable to stockholders, stock options and restricted stock units are considered to be common stock equivalents but are excluded from the calculation of diluted net loss per share attributable to stockholders as the effect is antidilutive. See Note 16, Basic and Diluted Net Loss Per Share.

Equity-Based Compensation

We account for equity-based compensation, which requires the measurement and recognition of compensation expense related to the fair value of equity-based compensation awards. Equity-based compensation expense includes the compensation cost for all share-based awards granted to employees, consultants and members of our board of directors (our "Board") based on the grant date fair value estimate. This also applies to awards modified, repurchased or canceled during the periods reported. We use the Black-Scholes option-pricing model to measure the fair value of stock options at the measurement date. We use the closing price of our common stock on the grant date to measure the fair value of restricted stock units at the measurement date. We account for forfeitures as they occur. Equity-based compensation expense is recorded in general and administrative expense in the consolidated statements of operations. See Note 15, Equity-Based Compensation.

Redeemable Noncontrolling Interests and Noncontrolling Interests

Noncontrolling interests represent third-party interests in the net assets of certain consolidated subsidiaries (the "tax equity entities"). For these tax equity entities, we have determined the appropriate methodology for calculating the noncontrolling interest balances that reflects the substantive economic arrangements in the operating agreements is a balance sheet approach using the hypothetical liquidation at book value ("HLBV") method. Under the HLBV method, the amounts reported as noncontrolling interests in the consolidated balance sheets represent the amounts third-party investors would hypothetically receive at each balance sheet date under the liquidation provisions of the operating agreements, assuming the net assets of the subsidiaries were liquidated at amounts determined in accordance with GAAP and distributed to the investors. The noncontrolling interest balances in these subsidiaries are reported as a component of equity in the consolidated balance sheets. The amount of income or loss allocated to noncontrolling interests in the results of operations for the subsidiaries using HLBV are determined as the difference in the noncontrolling interest balances in the consolidated balance sheets at the start and end of each reporting period, after taking into account any capital transactions between the subsidiaries and the third-party investors. Factors used in the HLBV calculation include GAAP income (loss), taxable income (loss), capital contributions, investment tax credits, distributions and the stipulated targeted investor return specified in the subsidiaries' operating agreements. Changes in these factors could have a significant impact on the amounts that investors would receive upon a hypothetical liquidation. The use of the HLBV method to allocate income (loss) to the noncontrolling interest holders may create volatility in the consolidated statements of operations as the application of HLBV can drive changes in net income or loss attributable to noncontrolling interests from period to period. We classify certain noncontrolling interests with redemption features that are not solely within our control outside of permanent equity in the consolidated balance sheets. Redeemable noncontrolling interests are reported using the greater of the carrying value at each reporting date as determined by the HLBV method or the estimated redemption value at the end of each reporting period. Estimating the redemption value of the redeemable noncontrolling interests requires the use of significant assumptions and estimates, such as projected future cash flows at the time the redemption feature can be exercised. The redeemable noncontrolling interests and noncontrolling interests are recorded net of related issuance costs and net of the basis difference in the solar energy systems transferred to the tax equity entities in the consolidated balance sheets. This basis difference is reflected as equity in subsidiaries attributable to parent in the consolidated statements of redeemable noncontrolling interests and equity. When we exercise our purchase option to purchase the Class A member's interest in a tax equity entity, the difference between the purchase price and carrying value of the redeemable noncontrolling interest or noncontrolling interest immediately prior to the purchase is reflected as an adjustment to accumulated deficit and no gain or loss is recognized in the consolidated statements of operations.

Self-Insurance

In January 2023, we changed our health insurance policy for qualifying employees in the U.S. from a fully-insured policy to a self-insured policy in order to administer insurance coverage to our employees at a lower cost to us. The change in insurance policy did not have a significant impact on our consolidated financial statements and related disclosures. Under the self-insured policy, we maintain stop-loss coverage from a third party that limits our exposure to large claims. We record a liability associated with these benefits that includes an estimate of both claims filed and losses incurred but not yet reported based on historical claims experience. In estimating this accrual, we utilize a third-party actuary to estimate a range of expected losses, which are based on an analysis of historical data. Assumptions are monitored and adjusted when warranted by changing circumstances. We record our liability for estimated losses under our self-insured policy in accrued liabilities in the consolidated balance sheets. As of December 31, 2023, our liability for self-insured claims was $3.5 million, which represents our best estimate of the future cost of claims incurred as of that date. We believe we have adequate reserves for these claims as of December 31, 2023; however, the actual value of such claims could be significantly affected if future occurrences and claims differ from these assumptions.

Sales of Investment Tax Credits ("ITCs")

In 2023, we entered into tax credit purchase and sale agreements with third-party purchasers to sell to such third-party purchasers, for cash, the Section 48(a) ITCs generated by certain solar energy systems that have or will be placed in service, subject to certain conditions set forth therein. We account for ITCs using the flow-through method. For tax credit purchase and sale agreements entered into by certain of our consolidated tax equity partnerships, we record our share of the sale as income tax benefit and the tax equity investor's share as an increase to redeemable noncontrolling interest or noncontrolling interest. As of December 31, 2023, accounts receivable from ITC sales of $200.7 million is recorded in accounts receivable—other in the consolidated balance sheet. During the year ended December 31, 2023, we recognized ITC sales of $207.4 million, of which $16.6 million is recorded in income tax benefit in the consolidated statement of operations and $190.8 million is recorded in redeemable noncontrolling interest in the consolidated balance sheet.

New Accounting Guidance

New accounting pronouncements are issued by the FASB or other standard setting bodies and are adopted as of the specified effective date.

In March 2022, the FASB issued Accounting Standards Update ("ASU") No. 2022-02, *Financial Instruments—Credit Losses: Troubled Debt Restructurings and Vintage Disclosures*, to eliminate the accounting guidance for troubled debt restructurings while enhancing disclosure requirements for certain loan refinancings and restructurings by creditors when a borrower is experiencing financial difficulty. This ASU is effective for annual and interim reporting periods beginning in January 2023. We adopted this ASU in January 2023 and determined it did not have a significant impact on our consolidated financial statements and related disclosures.

In November 2023, the FASB issued ASU No. 2023-07, *Segment Reporting: Improvements to Reportable Segment Disclosures,* to refine and ensure a broader and more transparent representation of segment-related financial activities. This ASU is effective for annual periods beginning in January 2024. We are currently evaluating the impact of this ASU on our consolidated financial statements and related disclosures.

In December 2023, the FASB issued ASU No. 2023-09, *Income Taxes: Improvements to Income Tax Disclosures,* to improve the transparency and effectiveness of income tax disclosures, including rate reconciliation and income taxes paid. This ASU is effective for annual periods beginning in January 2025. We are currently evaluating the impact of this ASU on our consolidated financial statements and related disclosures.

(3) Property and Equipment

The following table presents the detail of property and equipment, net as recorded in the consolidated balance sheets:

	Useful Lives (in years)	As of December 31, 2023 (in thousands)	As of December 31, 2022 (in thousands)
Solar energy systems and energy storage systems	35	$ 5,443,796	$ 3,719,727
Construction in progress		530,180	329,893
Asset retirement obligations	30	78,538	57,063
Information technology systems	3	130,300	72,797
Computers and equipment	3-5	7,503	4,976
Leasehold improvements	3-6	6,170	5,558
Furniture and fixtures	7	1,172	1,172
Vehicles	4-5	1,640	1,640
Other	5-6	419	157
Property and equipment, gross		6,199,718	4,192,983
Less: accumulated depreciation		(560,924)	(408,182)
Property and equipment, net		$ 5,638,794	$ 3,784,801

The amounts included in the above table for solar energy systems and energy storage systems and substantially all the construction in progress relate to our customer contracts (including PPAs and leases). These assets had accumulated depreciation of $489.7 million and $360.1 million as of December 31, 2023 and 2022, respectively.

(4) Natural Disaster Losses

We have insurance coverage related to property damage and business interruption. When a solar energy system is damaged by a natural disaster, we impair all or a portion of the net book value to operations and maintenance expense in the period for which the amount is probable and can be reasonably estimated. Insurance proceeds for property damage, up to the amount of impairment expense recorded for property damage, are estimated and recorded as a receivable (recorded in accounts receivable—other in the consolidated balance sheet) and a reduction to operations and maintenance expense when the receipt of the proceeds is deemed probable. Insurance proceeds for property damage that exceed the amount of impairment expense recorded and insurance proceeds related to business interruption are recorded when received, as a reduction to operations and maintenance expense. Costs incurred to repair or replace a solar energy system are capitalized (recorded in property and equipment, net in the consolidated balance sheet) and are classified as an investing cash outflow in the consolidated statement of cash flows. Insurance proceeds received for property damage are classified as an investing cash inflow in the consolidated statement of cash flows. Insurance proceeds received for business interruption are classified as an operating cash inflow in the consolidated statement of cash flows.

Hurricane Fiona in Puerto Rico. In September 2022, Hurricane Fiona made landfall in Puerto Rico causing significant wind and water damage to the island's infrastructure, residences and businesses. A majority of Puerto Rico was left without electrical power. In addition, other basic utility and infrastructure services (such as water, communications, ports and other transportation networks) were severely curtailed. We had no material damages to our solar energy systems and energy storage systems.

Hurricane Ian in Florida. In September 2022, Hurricane Ian made landfall in Florida causing catastrophic wind and water damage to the state's infrastructure, residences and businesses. We had no material damages to our solar energy systems and energy storage systems.

Typhoon Mawar in Guam and Northern Mariana Islands. In May 2023, Typhoon Mawar made landfall in Guam and the Northern Mariana Islands causing significant wind and water damage to the islands' infrastructure, residences and businesses. We had no material damages to our solar energy systems and energy storage systems.

Wildfires in Hawaii. In August 2023, a series of wildfires broke out in Hawaii causing widespread damage to the island's infrastructure, residences and businesses. We had no material damages to our solar energy systems and energy storage systems.

During the years ended December 31, 2023 and 2022, we incurred (a) $1.6 million and $633,000, respectively, related to third-parties helping our customers, primarily restarting batteries and (b) $730,000 and $532,000, respectively, related to employees performing similar type work or other work related to the hurricanes. The following table presents the impact of the natural disaster losses as recorded in the consolidated statements of operations:

	Year Ended December 31,		
	2023	2022	2021
		(in thousands)	
Operations and maintenance expense:			
Impairment of solar energy systems due to natural disaster losses	$ 3,865	$ —	$ —
Insurance proceeds received/expected to be received—property damage	(3,400)	—	—
Insurance proceeds received—business interruption	(350)	—	—
Other natural disaster-related charges	1,635	633	—
General and administrative expense:			
Other natural disaster-related charges	730	532	—
Total	$ 2,480	$ 1,165	$ —

(5) Detail of Certain Balance Sheet Captions

The following table presents the detail of other current assets as recorded in the consolidated balance sheets:

	As of December 31,	
	2023	2022
	(in thousands)	
Inventory	$ 148,575	$ 152,113
Current portion of customer notes receivable	176,562	114,910
Restricted cash	62,188	51,733
Prepaid assets	25,996	17,492
Deferred receivables	7,601	7,392
Current portion of investments in solar receivables	7,457	7,107
Other	920	553
Total	$ 429,299	$ 351,300

The following table presents the detail of other assets as recorded in the consolidated balance sheets:

	As of December 31,	
	2023	2022
	(in thousands)	
Construction in progress - customer notes receivable	$ 159,066	$ 382,611
Restricted cash	219,382	133,584
Exclusivity and other bonus arrangements with dealers, net	166,359	121,313
Investments in solar receivables	61,877	65,064
Straight-line revenue adjustment, net	62,941	53,086
Other	226,260	206,233
Total	$ 895,885	$ 961,891

The following table presents the detail of other current liabilities as recorded in the consolidated balance sheets:

	As of December 31,	
	2023	2022
	(in thousands)	
Interest payable	$ 67,647	$ 35,258
Deferred revenue	50,815	30,172
Current portion of operating and finance lease liability	4,231	3,247
Current portion of performance guarantee obligations	2,667	2,495
Other	8,289	334
Total	$ 133,649	$ 71,506

(6) AROs

AROs consist primarily of costs to remove solar energy system assets and costs to restore the solar energy system sites to the original condition, which we estimate based on current market rates. For each solar energy system, we recognize the fair value of the ARO as a liability and capitalize that cost as part of the cost basis of the related solar energy system. The related assets are depreciated on a straight-line basis over 30 years, which is the estimated average time a solar energy system will be installed in a location before being removed, and the related liabilities are accreted to the full value over the same period of time. We revise our estimated future liabilities based on recent actual experiences, including third party cost estimates, average size of solar energy systems and inflation rates, which we evaluate at least annually. Changes in our estimated future liabilities are recorded as either a reduction or addition in the carrying amount of the remaining unamortized asset and the ARO and either decrease or increase our depreciation and accretion expense amounts prospectively. The following table presents the changes in AROs as recorded in other long-term liabilities in the consolidated balance sheets:

	Year Ended December 31,	
	2023	2022
	(in thousands)	
Balance at beginning of period	$ 69,869	$ 54,396
Additional obligations incurred	21,529	11,871
Accretion expense	4,905	3,701
Other	(76)	(99)
Balance at end of period	$ 96,227	$ 69,869

(7) Customer Notes Receivable

We offer a loan program, under which the customer finances the purchase of a solar energy system, energy storage system and/or accessory through a customer agreement for a term of 10, 15 or 25 years. The following table presents the detail of customer notes receivable as recorded in the consolidated balance sheets and the corresponding fair values:

	As of December 31,	
	2023	2022
	(in thousands)	
Customer notes receivable	$ 4,029,025	$ 2,662,307
Allowance for credit losses	(116,477)	(81,248)
Customer notes receivable, net	$ 3,912,548	$ 2,581,059
Estimated fair value, net	$ 3,800,754	$ 2,554,948

The following table presents the changes in the allowance for credit losses related to customer notes receivable as recorded in the consolidated balance sheets:

	Year Ended December 31, 2023	2022
	(in thousands)	
Balance at beginning of period	$ 81,248	$ 41,138
Provision for current expected credit losses	35,229	40,074
Recoveries	—	36
Balance at end of period	$ 116,477	$ 81,248

As of December 31, 2023 and 2022, we invested $159.1 million and $382.6 million, respectively, in loan solar energy systems, energy storage systems and accessories not yet placed in service. For the years ended December 31, 2023 and 2022, interest income related to our customer notes receivable was $98.8 million and $56.4 million, respectively. As of December 31, 2023 and 2022, accrued interest receivable related to our customer notes receivable was $14.3 million and $10.2 million, respectively. As of December 31, 2023 and 2022, there was $34.2 million and $12.6 million, respectively, of customer notes receivable not accruing interest and there was $754,000 and $278,000, respectively, of allowance recorded for loans on nonaccrual status. For the years ended December 31, 2023 and 2022, interest income of $0 was recognized for loans on nonaccrual status and accrued interest receivable of $63,000 and $514,000, respectively, was written off by reversing interest income.

We consider the performance of our customer notes receivable portfolio and its impact on our allowance for credit losses. We also evaluate the credit quality based on the aging status and payment activity. The following table presents the aging of the amortized cost of customer notes receivable:

	As of December 31, 2023	2022
	(in thousands)	
1-90 days past due	$ 164,150	$ 91,668
91-180 days past due	40,428	16,859
Greater than 180 days past due	77,110	14,504
Total past due	281,688	123,031
Not past due	3,747,337	2,539,276
Total	$ 4,029,025	$ 2,662,307

As of December 31, 2023 and 2022, the amortized cost of our customer notes receivable more than 90 days past due but not on nonaccrual status was $83.3 million and $31.4 million, respectively. The following table presents the amortized cost by origination year of our customer notes receivable based on payment activity:

	Amortized Cost by Origination Year						
	2023	2022	2021	2020	2019	Prior	Total
	(in thousands)						
Payment performance:							
Performing	$ 1,482,469	$ 1,339,528	$ 692,995	$ 212,119	$ 109,781	$ 115,023	$ 3,951,915
Nonperforming (1)	8,612	30,877	19,148	5,491	4,792	8,190	77,110
Total	$ 1,491,081	$ 1,370,405	$ 712,143	$ 217,610	$ 114,573	$ 123,213	$ 4,029,025

(1) A nonperforming loan is a loan in which the customer is in default and has not made any scheduled principal or interest payments for 181 days or more.

(8) Investments in Solar Receivables

In November 2021, one of our wholly-owned subsidiaries entered into a Master Lease Agreement (the "EAH Master Lease") with Energy Asset HoldCo LLC, a Delaware limited liability company and subsidiary of Lennar ("EAH Lessor"), to lease two pools of solar energy systems and assume the related PPA and lease obligations from EAH Lessor. In exchange for the right to receive future customer cash flows as well as certain credits, rebates and incentives (including SRECs) under those pooled agreements, we made an upfront payment to Lennar consisting of $35.0 million in initial cash consideration and 1,027,409 shares of our common stock for net consideration of $79.4 million. Pursuant to the terms of the EAH Master Lease, additional pools of solar energy systems may also be leased from EAH Lessor in the future in exchange for upfront lease payments. We will evaluate additional systems on a quarterly basis and, if eligible, are required to tranche the systems under the EAH Master Lease until March 2025.

We established criteria for eligibility that ensures each solar energy system is operational, in service, in good standing and no liens or encumbrances exist. We continue to provide all operations, maintenance and asset management services to EAH Lessor related to the leased solar energy systems. EAH Lessor's residual interest in the solar energy systems comes from any customer renewal exercised after the twentieth anniversary of the contract term of the customer agreement, the remainder of the useful life of the solar energy system after the termination of the customer agreement and any tax incentives (including Section 48(a) ITCs) associated with the ownership of the solar energy system.

As the EAH Master Lease does not constitute or contain a lease under the criteria specified by ASC 842, the purchase of EAH Lessor's future revenue has been accounted for as an acquisition of financial assets and we have elected the fair value option under ASC 825. For the purposes of establishing the fair value of our investments in solar receivables, our analysis considers cash flows beginning in September 2021 (the effective date of the transaction). We estimated the fair value of our investments in solar receivables to be $84.3 million on the transaction date.

(9) Long-Term Debt

Our subsidiaries with long-term debt include Sunnova Energy Corporation, EZOP, HELII, RAYSI, HELIII, TEPH, SOLI, HELIV, AP8, SOLII, HELV, SOLIII, HELVI, HELVII, HELVIII, SOLIV, HELIX, HELX, IS, SOLV, HELXI, HELXII, AP9 and HESI. The following table presents the detail of long-term debt, net as recorded in the consolidated balance sheets:

	Year Ended December 31, 2023 Weighted Average Effective Interest Rates	As of December 31, 2023		Year Ended December 31, 2022 Weighted Average Effective Interest Rates	As of December 31, 2022	
		Long-term	Current		Long-term	Current
	(in thousands, except interest rates)					
SEI						
0.25% convertible senior notes	0.71%	$ 575,000	$ —	0.71%	$ 575,000	$ —
2.625% convertible senior notes	3.03%	600,000	—	3.11%	600,000	—
Debt discount, net		(19,174)	—		(24,324)	—
Deferred financing costs, net		(748)	—		(920)	—
Sunnova Energy Corporation						
Notes payable	7.07%	—	3,084		—	—
5.875% senior notes	6.53%	400,000	—	6.52%	400,000	—
11.75% senior notes	12.02%	400,000	—		—	—
Debt discount, net		(13,288)	—		(3,767)	—
Deferred financing costs, net		(12,119)	—		(7,339)	—
EZOP						
Revolving credit facility	8.72%	511,000	—	5.10%	500,000	—
Debt discount, net		(302)	—		(532)	—
HELII						
Solar asset-backed notes	5.64%	194,933	9,065	5.69%	204,016	8,632
Debt discount, net		(24)	—		(30)	—
Deferred financing costs, net		(2,926)	—		(3,591)	—
RAYSI						
Solar asset-backed notes	5.55%	105,096	6,349	5.54%	105,878	9,957
Debt discount, net		(753)	—		(960)	—

Deferred financing costs, net		(3,004)	—		(3,451)	—
HELIII						
Solar loan-backed notes	4.43%	86,232	9,983	4.42%	94,247	10,438
Debt discount, net		(1,250)	—		(1,536)	—
Deferred financing costs, net		(1,200)	—		(1,474)	—
TEPH						
Revolving credit facility	10.03%	1,036,600	—	7.74%	425,700	—
Debt discount, net		(1,168)	—		(2,043)	—
SOLI						
Solar asset-backed notes	3.91%	335,874	12,965	3.92%	348,962	16,063
Debt discount, net		(74)	—		(87)	—
Deferred financing costs, net		(5,769)	—		(6,827)	—
HELIV						
Solar loan-backed notes	4.16%	97,458	10,854	4.15%	105,655	11,494
Debt discount, net		(417)	—		(564)	—
Deferred financing costs, net		(1,955)	—		(2,609)	—
AP8						
Revolving credit facility	9.42%	—	215,000	20.52%	74,535	465
SOLII						
Solar asset-backed notes	3.90%	221,955	7,195	3.41%	232,276	6,409
Debt discount, net		(56)	—		(64)	—
Deferred financing costs, net		(3,948)	—		(4,576)	—
HELV						
Solar loan-backed notes	2.49%	134,473	13,496	2.47%	143,940	14,367
Debt discount, net		(540)	—		(690)	—
Deferred financing costs, net		(2,094)	—		(2,661)	—
SOLIII						
Solar asset-backed notes	2.81%	257,545	15,762	2.78%	275,779	16,632
Debt discount, net		(102)	—		(117)	—
Deferred financing costs, net		(4,871)	—		(5,616)	—
HELVI						
Solar loan-backed notes	2.10%	159,901	13,521	2.08%	167,669	16,770
Debt discount, net		(32)	—		(40)	—
Deferred financing costs, net		(2,345)	—		(2,909)	—
HELVII						
Solar loan-backed notes	2.53%	123,494	10,221	2.50%	126,856	16,058
Debt discount, net		(31)	—		(38)	—
Deferred financing costs, net		(1,797)	—		(2,193)	—
HELVIII						
Solar loan-backed notes	3.62%	243,020	19,995	3.54%	250,014	31,099
Debt discount, net		(4,355)	—		(5,267)	—
Deferred financing costs, net		(3,395)	—		(4,080)	—
SOLIV						
Solar asset-backed notes	5.90%	325,612	8,464	5.76%	338,251	8,080
Debt discount, net		(9,440)	—		(11,190)	—
Deferred financing costs, net		(6,759)	—		(7,996)	—
HELIX						
Solar loan-backed notes	5.64%	196,174	15,246	5.46%	193,837	29,632
Debt discount, net		(3,027)	—		(3,589)	—
Deferred financing costs, net		(2,798)	—		(3,303)	—
HELX						
Solar loan-backed notes	7.38%	200,842	19,996	6.23%	162,301	18,335
Debt discount, net		(17,015)	—		(12,459)	—
Deferred financing costs, net		(3,064)	—		(3,319)	—
IS						

Revolving credit facility	8.90%	31,300	—		—	—
SOLV						
Solar asset-backed notes	6.93%	312,844	7,775		—	—
Debt discount, net		(15,491)	—		—	—
Deferred financing costs, net		(6,682)	—		—	—
HELXI						
Solar loan-backed notes	6.29%	247,251	31,240		—	—
Debt discount, net		(12,007)	—		—	—
Deferred financing costs, net		(5,195)	—		—	—
HELXII						
Solar loan-backed notes	6.71%	210,263	26,661		—	—
Debt discount, net		(13,065)	—		—	—
Deferred financing costs, net		(4,135)	—		—	—
AP9						
Revolving credit facility	19.30%	12,118	—		—	—
Debt discount, net		(572)	—		—	—
HESI						
Solar loan-backed notes	10.94%	213,432	26,625		—	—
Debt discount, net		(7,616)	—		—	—
Deferred financing costs, net		(7,058)	—		—	—
Total		$ 7,030,756	$ 483,497		$ 5,194,755	$ 214,431

Availability. As of December 31, 2023, we had $733.0 million of available borrowing capacity under our various financing arrangements, consisting of $364.0 million under the EZOP revolving credit facility, $272.4 million under the TEPH revolving credit facility, $18.7 million under the IS revolving credit facility, $52.9 million under the AP9 revolving credit facility and $25.0 million under the BMB revolving credit facility. There was no available borrowing capacity under any of our other financing arrangements. As of December 31, 2023, we were in compliance with all debt covenants under our financing arrangements.

Weighted Average Effective Interest Rates. The weighted average effective interest rates disclosed in the table above are the weighted average stated interest rates for each debt instrument plus the effect on interest expense for other items classified as interest expense, such as the amortization of deferred financing costs, amortization of debt discounts and commitment fees on unused balances for the period of time the debt was outstanding during the indicated periods.

SEI Debt. In May 2021, we issued and sold an aggregate principal amount of $575.0 million of our 0.25% convertible senior notes ("0.25% convertible senior notes") in a private placement at a discount to the initial purchasers of 2.5%, for an aggregate purchase price of $560.6 million. The 0.25% convertible senior notes mature in December 2026 unless earlier redeemed, repurchased or converted. In connection with the pricing of the 0.25% convertible senior notes, we used proceeds of $91.7 million to enter into privately negotiated capped call transactions, which are expected to reduce the potential dilution to common shares and/or offset potential cash payments that could be required to be made in excess of the principal amount upon any exchange of notes. Such reduction and/or offset is subject to a cap initially equal to $60.00 per share, subject to adjustments. The capped call transactions cover, subject to customary adjustments, the number of shares of our common stock initially underlying the 0.25% convertible senior notes. As the capped call transactions meet certain accounting criteria, they are classified as stockholders' equity and therefore, are recorded in additional paid-in capital—common stock in the consolidated balance sheet and are not accounted for as derivatives.

In August 2022, we issued and sold an aggregate principal amount of $600.0 million of our 2.625% convertible senior notes ("2.625% convertible senior notes") in a private placement at a discount to the initial purchasers of 2.5%, for an aggregate purchase price of $585.0 million. The 2.625% convertible senior notes mature in February 2028 unless earlier redeemed, repurchased or converted. In connection with the pricing of the 2.625% convertible senior notes, we used proceeds of $48.4 million to enter into privately negotiated capped call transactions, which are expected to reduce the potential dilution to common shares and/or offset potential cash payments that could be required to be made in excess of the principal amount upon any exchange of notes. Such reduction and/or offset is subject to a cap initially equal to $34.24 per share, subject to adjustments. The capped call transactions cover, subject to customary adjustments, the number of shares of our common stock initially underlying the 2.625% convertible senior notes. As the capped call transactions meet certain accounting criteria, they are classified as stockholders' equity and therefore, are recorded in additional paid-in capital—common stock in the consolidated balance sheet and are not accounted for as derivatives.

Sunnova Energy Corporation Debt. In August 2021, Sunnova Energy Corporation issued and sold an aggregate principal amount of $400.0 million of 5.875% senior notes ("5.875% senior notes") at a discount to the initial purchasers of approximately 1.24%, for an aggregate purchase price of $395.0 million. The 5.875% senior notes mature in September 2026 and are initially guaranteed on a senior unsecured basis by SEI and a wholly-owned subsidiary of Sunnova Energy Corporation. In June 2023, Sunnova Energy Corporation entered into an arrangement to finance $6.8 million of insurance premiums at an annual interest rate of 7.24% over ten months. In August 2023, Sunnova Energy Corporation entered into an arrangement to finance $1.5 million of insurance premiums at an annual interest rate of 7.49% over ten months. In September 2023, Sunnova Energy Corporation entered into an arrangement to finance $1.9 million of insurance premiums at an annual interest rate of 7.49% over nine months. In September 2023, Sunnova Energy Corporation issued and sold an aggregate principal amount of $400.0 million of 11.75% senior notes ("11.75% senior notes") at a discount to the initial purchasers of approximately 2.74%, for an aggregate purchase price of approximately $389.0 million. The 11.75% senior notes mature in October 2028 and are initially guaranteed on a senior unsecured basis by SEI and a wholly-owned subsidiary of Sunnova Energy Corporation.

EZOP Debt. In April 2017, EZOP, a special purpose entity, entered into a secured revolving credit facility with Credit Suisse AG, New York Branch, as agent, and the lenders party thereto, for an aggregate commitment amount of $100.0 million with a maturity date of April 2019. In August 2017, the aggregate commitment amount was reduced to $70.0 million and in March 2019, the aggregate commitment amount was increased to $200.0 million. The EZOP revolving credit facility allows for the pooling and transfer of eligible loans on a non-recourse basis subject to certain limited exceptions. The proceeds of the loans under the EZOP revolving credit facility are available to purchase or otherwise acquire loans (which we originated) directly from Sunnova Asset Portfolio 7 Holdings, LLC ("AP7H") pursuant to a sale and contribution agreement, fund certain reserve accounts that are required to be maintained by EZOP in accordance with the EZOP revolving credit agreement and pay fees and expenses incurred in connection with the EZOP revolving credit facility. The amount available for borrowings at any one time under the EZOP revolving credit facility is limited to a borrowing base amount determined at each borrowing and calculated based on the aggregate solar loan balance of eligible solar loans of EZOP multiplied by the weighted average advance rate.

Interest on the borrowings under the EZOP revolving credit facility is due monthly. Borrowings under the EZOP revolving credit facility bear interest at an annual rate equal to the weighted-average cost to the lender of any commercial paper (to the extent the lender funds an advance by issuing commercial paper) plus 3.50% during the commitment availability period and 4.50% after the commitment availability period. The EZOP revolving credit facility requires EZOP to pay a fee based on the daily unused portion of the commitments under the EZOP revolving credit facility. Payments from the loans will be deposited into accounts established pursuant to the EZOP revolving credit facility and applied in accordance with a cash waterfall in the manner specified in the EZOP revolving credit facility. EZOP is also required to maintain certain reserve accounts for the benefit of the lenders under the EZOP revolving credit facility, each of which must remain funded at all times to the levels specified in the credit agreement. In connection with the EZOP revolving credit facility, certain of our affiliates receive a fee for managing and servicing the solar loan agreements and related solar energy systems pursuant to management and servicing agreements. In addition, Sunnova Energy Corporation has guaranteed (a) the manager's obligations to manage the solar loan agreements and related solar energy systems pursuant to the management agreement, (b) the servicer's obligations to service the solar loan agreements and related solar energy systems pursuant to the servicing agreement, (c) AP7H's obligations to repurchase or substitute certain ineligible solar loans sold to EZOP pursuant to certain sale and contribution agreements and (d) certain indemnification obligations related to its affiliates in connection with the EZOP revolving credit facility, but does not provide a general guarantee of the creditworthiness of the assets of EZOP pledged as the collateral for the EZOP revolving credit facility. Under the limited guarantee, Sunnova Energy Corporation is subject to certain financial covenants regarding tangible net worth, working capital and restrictions on the use of proceeds from the EZOP revolving credit facility.

In March 2021, we amended the EZOP revolving credit facility to, among other things, (a) extend the maturity date to November 2023 and (b) increase the uncommitted maximum facility amount from $200.0 million to $350.0 million. In June 2022, we amended the EZOP revolving credit facility to, among other things, (a) extend the scheduled commitment termination date to May 2024, (b) extend the facility maturity date to November 2024, (c) increase the aggregate commitment amount from $200.0 million to $400.0 million, subject to reductions based on the outstanding principal balance of advances over certain time periods, (d) increase the uncommitted maximum facility amount from $350.0 million to $475.0 million, (e) modify the interest rate on borrowings from accruing based on the London interbank offered rate ("LIBOR") to accruing based on Term SOFR (as defined by such revolving credit facility), plus a Term SOFR (as defined by such revolving credit facility) spread adjustment, (f) add an amortization event related to certain of our subsidiaries ceasing to originate solar loans (subject to certain thresholds, time periods and exceptions set forth therein), (g) add concentration limits for solar loans (1) with obligors with credit scores below certain thresholds and (2) for which the original principal balance exceeds a certain threshold and (h) modify eligibility requirements for solar loans to increase the permitted maximum original principal balance. In July 2022, we amended the EZOP revolving credit facility to, among other things, increase the uncommitted maximum facility amount from $475.0 million to

$535.0 million until the earlier to occur of (a) September 29, 2022 and (b) the date upon which a specific sale of borrowing base assets and a related prepayment of outstanding debt thereunder occurs, upon the occurrence of which the uncommitted maximum facility amount will return to $475.0 million. In August 2022, we amended the EZOP revolving credit facility to, among other things, (a) increase the aggregate commitment amount from $400.0 million to $450.0 million, (b) increase the uncommitted maximum facility amount from $535.0 million to $585.0 million, (c) amend certain provisions addressing the allocation of advances and principal payments among the lenders, (d) amend certain provisions addressing lender consent rights and related matters and (e) include certain provisions addressing service incentives and related matters. In September 2022, we amended the EZOP revolving credit facility to, among other things, (a) decrease the uncommitted maximum facility amount from $585.0 million to $575.0 million and (b) amend certain provisions related to the agent's allocation of certain payments made to the lenders.

In February 2023, we amended the EZOP revolving credit facility to, among other things, (a) increase the aggregate commitment amount from $450.0 million to $675.0 million, (b) increase the uncommitted maximum facility amount from $575.0 million to $800.0 million, (c) amend certain provisions related to the allocation of certain payments made to the lenders, (d) amend certain provisions related to excess concentration limits and eligibility criteria to permit us and our affiliates to provide warranties of, and replacements for, load controllers and generators in connection with the related solar loan contracts and (e) add provisions to allow EZOP to request an increase in the aggregate commitment amount (subject to certain conditions) by adding additional lenders to the EZOP revolving credit facility. In February 2023, Credit Suisse AG ("Credit Suisse") sold a significant part of its Securitized Products Group (the "Credit Suisse Securitized Products Sale") to Apollo Global Management ("Apollo"). Subsequently, Apollo publicly announced the majority of the assets and professionals associated with the sale are now part of or managed by ATLAS SP Partners, a new stand-alone credit firm focused on asset-backed financing and capital markets solutions ("Atlas"). In March 2023, in connection with the Credit Suisse Securitized Products Sale, certain of our subsidiaries consented to the assignment of the loans and commitments of the Credit Suisse lenders to the Atlas lenders (such assignment, the "EZOP Assignment") under the EZOP revolving credit facility. In connection with the EZOP Assignment, Credit Suisse AG, New York Branch ("CSNYB") resigned as the agent under the EZOP revolving credit facility, Atlas Securitized Products Holdings, L.P. (the "Successor Agent") was appointed as the successor agent thereunder and, in connection with such appointment, the Successor Agent assumed the agent roles under the EZOP revolving credit facility. In connection with the appointment of Atlas as Successor Agent, the borrowers and the lenders party to the applicable agency resignation and appointment agreements consented to, among other things, Atlas' ability to assign the agent role under the EZOP revolving credit facility to one of its affiliates subject to certain conditions set forth therein. In March 2023, after the EZOP Assignment, we amended the EZOP revolving credit facility to, among other things, (a) increase the aggregate commitment amount from $675.0 million to $775.0 million, (b) increase the uncommitted maximum facility amount from $800.0 million to $900.0 million, (c) amend and supplement certain defaulting lender provisions and (d) update the references from CSNYB, the predecessor agent, to Atlas, the successor agent, and remove or modify certain provisions related to the borrowing, funding and allocation of payments among the previous lender syndicate (that previously included lenders affiliated with Credit Suisse that, prior to the date of the amendment to the EZOP revolving credit facility and pursuant to the EZOP Assignment, had assigned their loans and commitments to lenders affiliated with Atlas). In August 2023, we amended and restated the EZOP revolving credit facility to, among other things, (a) increase the aggregate commitment amount from $775.0 million to $875.0 million, (b) increase the uncommitted maximum facility amount from $900.0 million to $1.0 billion, (c) extend the maturity date from November 2024 to November 2025 and (d) amend the Advance Rate (as defined therein). In October 2023, we amended the EZOP revolving credit facility to, among other things, reallocate commitments among the lenders.

HELII Debt. In November 2018, we pooled and transferred eligible solar energy systems and the related asset receivables into HELII, a special purpose entity, that issued $202.0 million in aggregate principal amount of Series 2018-1 Class A solar asset-backed notes and $60.7 million in aggregate principal amount of Series 2018-1 Class B solar asset-backed notes (collectively, the "HELII Notes") with a maturity date of July 2048. The HELII Notes were issued at a discount of 0.02% for Class A and 0.02% for Class B and bear interest at an annual rate equal to 4.87% and 7.71% for the Class A and Class B notes, respectively. The cash flows generated by these solar energy systems are used to service the semi-annual principal and interest payments on the HELII Notes and satisfy HELII's expenses, and any remaining cash can be distributed to Helios Depositor II, LLC, HELII's sole member. In connection with the HELII Notes, certain of our affiliates receive a fee for managing and servicing the solar energy systems pursuant to management and servicing agreements. In addition, Sunnova Energy Corporation has guaranteed (a) the manager's obligations to manage the solar energy systems pursuant to the management agreement, (b) the servicer's obligations to service the solar energy systems pursuant to the servicing agreement and (c) Sunnova ABS Holdings, LLC's obligations to repurchase or substitute certain ineligible solar energy systems eventually sold to HELII pursuant to the sale and contribution agreement. HELII is also required to maintain certain reserve accounts for the benefit of the holders of the HELII Notes, each of which must remain funded at all times to the levels specified in the HELII Notes. The indenture requires HELII to track the DSCR of (a) the amount of certain payments received from customers, certain performance based incentives, certain energy credits and any applicable insurance proceeds as of a specific date to (b) interest and scheduled principal due on the HELII Notes as of such date with the potential to enter into an early amortization period if the DSCR drops below a certain threshold. The holders of the HELII Notes have no recourse to our other assets except as expressly set forth in the HELII Notes.

RAYSI Debt. In March 2019, we pooled and transferred eligible solar energy systems and the related asset receivables into RAYSI, a special purpose entity, that issued $118.1 million in aggregate principal amount of Series 2019-1 Class A solar asset-backed notes with a maturity date of April 2044 and $15.0 million in aggregate principal amount of Series 2019-1 Class B solar asset-backed notes with a maturity date of April 2034. The notes were issued with no discount for Class A and at a discount of 6.50% for Class B and bear interest at an annual rate equal to 4.95% and 6.35% for the Class A and Class B notes, respectively. In June 2019, RAYSI issued $6.4 million in aggregate principal amount of 2019-2 Class B solar asset-backed notes with a maturity date of April 2034 pursuant to a supplemental note purchase agreement at a discount rate of 10.50% and bear interest at an annual rate equal to 6.35%. The notes issued by RAYSI are referred to as the "RAYSI Notes". The cash flows generated by these solar energy systems are used to service the semi-annual principal and interest payments on the RAYSI Notes and satisfy RAYSI's expenses, and any remaining cash can be distributed to Sunnova RAYS Depositor II, LLC, RAYSI's sole member. In connection with the RAYSI Notes, certain of our affiliates receive a fee for managing and servicing the solar energy systems pursuant to management, servicing, facility administration and asset management agreements. In addition, Sunnova Energy Corporation has guaranteed, among other things, (a) the obligations of certain of our subsidiaries to manage and service the solar energy systems pursuant to management, servicing, facility administration and asset management agreements, (b) the managing member's obligations, in such capacity, under the related financing fund's limited liability company agreement and (c) certain of our subsidiaries' obligations to repurchase or substitute certain ineligible solar energy systems eventually sold to RAYSI pursuant to the related sale and contribution agreement. RAYSI is also required to maintain certain reserve accounts for the benefit of the holders of the RAYSI Notes, each of which must remain funded at all times to the levels specified in the RAYSI Notes. The indenture requires RAYSI to track the DSCR of (a) the amount of certain payments received from customers, certain performance based incentives, certain energy credits and any applicable insurance proceeds as of a specific date to (b) interest and scheduled principal due on the RAYSI Notes as of such date with the potential to enter into an early amortization period if the DSCR drops below a certain threshold. The indenture contains cross-default provisions under which a material default by (a) RAYSI or (b) a tax equity fund under the applicable tax equity transaction documents would, upon the expiration of certain time periods, result in an event of default under the RAYSI indenture. The holders of the RAYSI Notes have no recourse to our other assets except as expressly set forth in the RAYSI Notes.

HELIII Debt. In June 2019, we pooled and transferred eligible solar loans and the related receivables into HELIII, a special purpose entity, that issued $139.7 million in aggregate principal amount of Series 2019-A Class A solar loan-backed notes, $14.9 million in aggregate principal amount of Series 2019-A Class B solar loan-backed notes and $13.0 million in aggregate principal amount of Series 2019-A Class C solar loan-backed notes (collectively, the "HELIII Notes") with a maturity date of June 2046. The HELIII Notes were issued at a discount of 0.03% for Class A, 0.01% for Class B and 0.03% for Class C and bear interest at an annual rate of 3.75%, 4.49% and 5.32% for the Class A, Class B and Class C notes, respectively. The cash flows generated by these solar loans are used to service the semi-annual principal and interest payments on the HELIII Notes and satisfy HELIII's expenses, and any remaining cash can be distributed to Sunnova Helios III Depositor, LLC, HELIII's sole member. In connection with the HELIII Notes, certain of our affiliates receive a fee for managing and servicing the solar energy systems pursuant to management and servicing agreements. In addition, Sunnova Energy Corporation has guaranteed, among other things, (a) the obligations of certain of our subsidiaries to manage and service the solar energy systems pursuant to management and servicing agreements, (b) the managing member's obligations, in such capacity, under the related financing fund's limited liability company agreement and (c) certain of our subsidiaries' obligations to repurchase or substitute certain ineligible solar loans eventually sold to HELIII pursuant to the related sale and contribution agreement. HELIII is also required to maintain certain reserve accounts for inverter replacement and a capitalized interest reserve account for the benefit of the holders of the HELIII Notes, each of which must remain funded at all times to the levels specified in the HELIII Notes. The holders of the HELIII Notes have no recourse to our other assets except as expressly set forth in the HELIII Notes.

TEPH Debt. In September 2019, TEPH, a wholly-owned subsidiary of SEI, entered into a revolving credit facility with Credit Suisse AG, New York Branch, as administrative agent, and the lenders party thereto, for an aggregate committed amount of $100.0 million with a maturity date of November 2022. The TEPH revolving credit facility allows for borrowings based on the aggregate value of solar assets owned by subsidiaries of TEPH subject to certain excess concentration limitations. The proceeds from the TEPH revolving credit facility are available for funding certain reserve accounts required by the TEPH revolving credit facility, making distributions to the parent of TEPH and paying fees incurred in connection with closing the TEPH revolving credit facility. The TEPH revolving credit facility is non-recourse to SEI and is secured by net cash flows from PPAs and leases available to the borrower after distributions to tax equity investors and payment of certain operating, maintenance and other expenses. Sunnova Energy Corporation guarantees the performance of certain affiliates who manage the collateral related to the TEPH revolving credit facility as well as certain indemnity and repurchase obligations. Under the limited guarantee, Sunnova Energy Corporation is subject to certain financial covenants regarding tangible net worth, working capital and restrictions on the use of proceeds from the facility. In addition, TEPH's obligations under the TEPH revolving credit facility are guaranteed by certain subsidiaries of TEPH. Borrowings under the TEPH revolving credit facility are made in Class A loans and Class B loans. The TEPH revolving credit facility has an advance rate equal to approximately 60% of the value of the solar projects in the portfolio that have not yet begun construction and 80% of the value of the solar projects that have reached substantial completion. Interest on the borrowings under the TEPH revolving credit facility is due quarterly. Borrowings under the TEPH revolving credit facility initially bore interest at an annual rate of either LIBOR divided by a percentage equal to 100% minus a reserve percentage or a base rate (defined as, for any day, a rate of interest per annum equal to the highest of (a) the prime rate for such day and (b) the sum of the weighted average of the rates on overnight federal funds transactions with members of the federal reserve system arranged by federal funds brokers as published for such day plus 0.50%), plus a margin of between 2.90% and 4.30%, which varies based on criteria including (a) whether the availability period has expired, (b) whether a takeout transaction has occurred in the last 18 months and (c) the ratio of Class A loans to Class B loans outstanding at such time.

In January 2021, we amended the TEPH revolving credit facility to, among other things, (a) permit certain transactions in SRECs (or proceeds therefrom) and related hedging arrangements and exclude certain of such amounts from the calculation of net cash flow available to service the indebtedness and (b) allow for borrowings with respect to certain ancillary components. In September 2021, we amended the TEPH revolving credit facility to, among other things, modify the hedging requirements to be based on borrowing capacity until March 2022, rather than amount currently borrowed. In October 2021, we amended the TEPH revolving credit facility to, among other things, update the LIBOR transition terms and transfer a portion of the loan commitment to an additional lender. In September 2022, we amended the TEPH revolving credit facility to, among other things, (a) increase the aggregate commitment amount from $460.7 million to $564.7 million, (b) increase the uncommitted maximum facility amount from $600.0 million to $639.7 million, (c) extend the facility maturity date to November 2024, (d) amend certain excess concentration limitations, (e) replace LIBOR with Term SOFR (as defined by such revolving credit facility) as the interest rate benchmark and include benchmark replacement provisions and (f) include certain provisions addressing grid services revenue and related matters. In October 2022, we amended the TEPH revolving credit facility to, among other things, (a) increase the aggregate commitment amount from $564.7 million to $600.0 million and (b) increase the uncommitted maximum facility amount from $639.7 million to $689.7 million.

In March 2023, in connection with the Credit Suisse Securitized Products Sale, certain of our subsidiaries consented to the assignment of the loans and commitments of the Credit Suisse lenders to the Atlas lenders (such assignment, the "TEPH Assignment") under the TEPH revolving credit facility. In connection with the TEPH Assignment, CSNYB resigned as the agent under the TEPH revolving credit facility, Atlas was appointed as the successor agent thereunder and, in connection with such appointment, the Successor Agent assumed the agent roles under the TEPH revolving credit facility. In connection with the appointment of Atlas as Successor Agent, the borrowers and the lenders party to the applicable agency resignation and appointment agreements consented to, among other things, Atlas' ability to assign the agent role under the TEPH revolving credit facility to one of its affiliates subject to certain conditions set forth therein. In March 2023, after the TEPH Assignment, we amended the TEPH revolving credit facility to, among other things, (a) increase the aggregate commitment amount from $600.0 million to $700.0 million, (b) increase the uncommitted maximum facility amount from $689.7 million to $789.7 million, (c) add provisions to allow TEPH to request an increase in the aggregate commitment amount (subject to certain conditions) by adding additional lenders to the TEPH revolving credit facility, (d) amend and supplement certain defaulting lender provisions, (e) modify the hedging provisions to give all hedge counterparties the benefit of certain payment priorities and certain other terms previously limited to qualifying hedge counterparties (as defined by such revolving credit facility), to extend the time period for the event of default resulting from hedge counterparties ceasing to be qualifying hedge counterparties and to make other hedge-related amendments, (f) update the references from CSNYB, the predecessor administrative agent, to Atlas, the successor administrative agent, and remove or modify certain provisions related to the borrowing, funding and allocation of payments among the previous lender syndicate (that previously included lenders affiliated with Credit Suisse that, prior to the date of the amendment to the TEPH revolving credit facility and pursuant to the TEPH Assignment, had assigned their loans and commitments to lenders affiliated with Atlas), (g) add European Union bail-in provisions and (h) add certain syndication-related provisions. In August 2023, we amended the TEPH revolving credit facility to, among other things, (a) increase the aggregate commitment amount from $700.0 million to $769.3 million, (b) increase the uncommitted maximum facility amount from $789.7 million to $859.0 million and (c) extend the maturity date from November 2024 to November 2025. In November 2023, we amended and restated the TEPH revolving credit facility to, among other things, (a) increase the aggregate commitment amount from $769.3 million to $1.309 billion and (b) increase the uncommitted maximum facility amount from $859.0 million to $1.575 billion. In December 2023, an additional lender joined the TEPH revolving credit facility and the aggregate commitment amount was increased from $1.309 billion to $1.311 billion.

SOLI Debt. In February 2020, we pooled and transferred eligible solar energy systems and the related asset receivables into wholly-owned subsidiaries of SOLI, a special purpose entity, that issued $337.1 million in aggregate principal amount of Series 2020-1 Class A solar asset-backed notes and $75.4 million in aggregate principal amount of Series 2020-1 Class B solar asset-backed notes (collectively, the "SOLI Notes") with a maturity date of January 2055. The SOLI Notes were issued at a discount of 0.89% for Class A and 0.85% for Class B and bear interest at an annual rate equal to 3.35% and 5.54% for the Class A and Class B notes, respectively. The cash flows generated by the solar energy systems of SOLI's subsidiaries are used to service the quarterly principal and interest payments on the SOLI Notes and satisfy SOLI's expenses, and any remaining cash can be distributed to Sunnova Sol Depositor, LLC, SOLI's sole member. In connection with the SOLI Notes, certain of our affiliates receive a fee for managing and servicing the solar energy systems pursuant to a transaction management agreement and managing and servicing agreements. In addition, Sunnova Energy Corporation has guaranteed (a) the obligations of certain of our subsidiaries to manage and service the solar energy systems pursuant to management, servicing and transaction management agreements, (b) the managing members' obligations, in such capacity, under the related financing fund's limited liability company agreement and (c) certain of our subsidiaries' obligations to repurchase or substitute certain ineligible solar energy systems eventually sold to SOLI pursuant to the sale and contribution agreement. SOLI is also required to maintain certain reserve accounts for the benefit of the holders of the SOLI Notes, each of which must remain funded at all times to the levels specified in the SOLI Notes. The indenture requires SOLI to track the DSCR of (a) the amount of certain payments received from customers, certain performance based incentives, certain energy credits and any applicable insurance proceeds as of a specific date to (b) interest and scheduled principal due on the SOLI Notes as of such date with the potential to enter into an early amortization period if the DSCR drops below a certain threshold. The holders of the SOLI Notes have no recourse to our other assets except as expressly set forth in the SOLI Notes.

HELIV Debt. In June 2020, we pooled and transferred eligible solar loans and the related receivables into HELIV, a special purpose entity, that issued $135.9 million in aggregate principal amount of Series 2020-A Class A solar loan-backed notes and $22.6 million in aggregate principal amount of Series 2020-A Class B solar loan-backed notes (collectively, the "HELIV Notes") with a maturity date of June 2047. The HELIV Notes were issued at a discount of 0.01% for Class A and 4.18% for Class B and bear interest at an annual rate of 2.98% and 7.25% for the Class A and Class B notes, respectively. The cash flows generated by these solar loans are used to service the monthly principal and interest payments on the HELIV Notes and satisfy HELIV's expenses, and any remaining cash can be distributed to Sunnova Helios IV Depositor, LLC, HELIV's sole member. In connection with the HELIV Notes, certain of our affiliates receive a fee for managing and servicing the solar energy systems pursuant to management and service agreements. In addition, Sunnova Energy Corporation has guaranteed, among other things, (a) the obligations of certain of our subsidiaries to manage and service the solar energy systems pursuant to management and servicing agreements and (b) certain of our subsidiaries' obligations to repurchase or substitute certain ineligible solar loans eventually sold to HELIV pursuant to the related sale and contribution agreement. HELIV is also required to maintain certain reserve accounts for the benefit of the holders of the HELIV Notes, each of which must be funded at all times to the levels specified in the HELIV Notes. The holders of the HELIV Notes have no recourse to our other assets except as expressly set forth in the HELIV Notes.

AP8 Debt. In September 2020, AP8 entered into a secured revolving credit facility with Banco Popular de Puerto Rico, as agent, and the lenders party thereto, for an aggregate committed amount of $60.0 million with a maturity date of September 2023. The proceeds of the loans under the AP8 revolving credit facility were initially available to purchase or otherwise acquire solar loans, fund a reserve account that is required to be maintained by AP8 in accordance with the credit agreement and pay fees and expenses incurred in connection with the AP8 revolving credit facility. The amount available for borrowings at any one time under the AP8 revolving credit facility was initially limited to a borrowing base amount determined at each borrowing and calculated based on a specified advance rate applied to the net outstanding principal balance of the solar loans securing the AP8 revolving credit facility. After giving effect to the amendments described below, interest on the borrowings under the AP8 revolving credit facility is due quarterly. Borrowings under the AP8 revolving credit facility bear interest at an annual rate based on Term SOFR (as defined by such revolving credit facility).

In connection with the AP8 revolving credit facility, certain of our affiliates receive a fee for managing and servicing the solar loan agreements and related solar energy systems pursuant to management and servicing agreements. In addition, Sunnova Energy Corporation has guaranteed (a) the manager's obligations to manage the solar loan agreements and related solar energy systems pursuant to the management agreement, (b) the servicer's obligations to service the solar loan agreements and related solar energy systems pursuant to the servicing agreement, (c) Sunnova Asset Portfolio 8 Holdings, LLC's obligations to repurchase or substitute certain ineligible solar loans sold to AP8 pursuant to certain sale and contribution agreements, (d) the obligation of AP8 to cure any condition that has caused a solar asset to become a defective solar asset or pay certain liquidated damages, (e) the performance by AP8 of certain obligations in respect of its role as managing member of the financing funds under the credit agreement, (f) certain indemnification obligations related to its affiliates in connection with the AP8 revolving credit facility and (g) the obligation of AP8 under the AP8 revolving credit facility to the extent a default is caused by a misappropriation of funds or certain insolvency events related to AP8, but does not provide a general guarantee of the creditworthiness of the assets of AP8 pledged as the collateral for the AP8 revolving credit facility. Under the limited guarantee, Sunnova Energy Corporation is subject to certain financial covenants regarding tangible net worth, working capital and restrictions on the use of proceeds from the AP8 revolving credit facility. In addition, AP8's obligations under the AP8 revolving credit facility are guaranteed by certain subsidiaries of AP8.

In November 2022, we amended the AP8 revolving credit facility to, among other things, (a) increase the aggregate commitment amount from $60.0 million to $75.0 million, (b) extend the facility maturity date from September 2023 to September 2024, (c) add provisions to permit the borrower to acquire and own managing members of financing funds and related covenants regarding the ownership of such managing members of financing funds, (d) add the ability to borrow against solar assets, including amending the definition of "Borrowing Base" and related provisions and covenants to account for solar assets, (e) amend the eligibility criteria, concentration limits and amortization events for solar loans and the addition of solar assets, (f) replace LIBOR with Term SOFR (as defined by such revolving credit facility) as the interest rate benchmark and include benchmark replacement provisions, (g) amend the interest rate on borrowings to an annual rate of Term SOFR (as defined by such revolving credit facility) plus 3.00%, with interest payments being due quarterly and (h) include certain provisions addressing grid services revenue, service incentives, service incentives rebates and related matters. In March 2023, we amended the AP8 revolving credit facility to, among other things, increase the aggregate commitment amount from $75.0 million to $150.0 million. In June 2023, we amended the AP8 revolving credit facility to, among other things, increase the aggregate commitment amount from $150.0 million to $185.0 million. In August 2023, we amended the AP8 revolving credit facility to, among other things, increase the aggregate commitment amount from $185.0 million to $215.0 million. We believe we will be able to satisfy this obligation due in September 2024 through refinancing of the facility or alternatively through the use of our existing cash resources and liquidity.

SOLII Debt. In November 2020, we pooled and transferred eligible solar energy systems and the related asset receivables into wholly-owned subsidiaries of SOLII, a special purpose entity, that issued $209.1 million in aggregate principal amount of Series 2020-2 Class A solar asset-backed notes and $45.6 million in aggregate principal amount of Series 2020-2 Class B solar asset-backed notes (collectively, the "SOLII Notes") with a maturity date of November 2055. The SOLII Notes were issued at a discount of 0.03% for Class A and 0.05% for Class B and bear interest at an annual rate equal to 2.73% and 5.47% for the Class A and Class B notes, respectively. The cash flows generated by the solar energy systems of SOLII's subsidiaries are used to service the quarterly principal and interest payments on the SOLII Notes and satisfy SOLII's expenses, and any remaining cash can be distributed to Sunnova Sol II Depositor, LLC, SOLII's sole member. In connection with the SOLII Notes, certain of our affiliates receive a fee for managing and servicing the solar energy systems pursuant to a transaction management agreement and managing and servicing agreements. In addition, Sunnova Energy Corporation has guaranteed (a) the obligations of certain of our subsidiaries to manage and service the solar energy systems pursuant to management, servicing and transaction management agreements, (b) the managing members' obligations, in such capacity, under the related financing fund's limited liability company agreement and (c) certain of our subsidiaries' obligations to repurchase or substitute certain ineligible solar energy systems eventually sold to SOLII pursuant to the sale and contribution agreement. SOLII is also required to maintain certain reserve accounts for the benefit of the holders of the SOLII Notes, each of which must remain funded at all times to the levels specified in the SOLII Notes. The indenture requires SOLII to track the DSCR of (a) the amount of certain payments received from customers, certain performance based incentives, certain energy credits and any applicable insurance proceeds as of a specific date to (b) interest and scheduled principal due on the SOLII Notes as of such date with the potential to enter into an early amortization period if the DSCR drops below a certain threshold. The holders of the SOLII Notes have no recourse to our other assets except as expressly set forth in the SOLII Notes.

HELV Debt. In February 2021, we pooled and transferred eligible solar loans and the related receivables into HELV, a special purpose entity, that issued $150.1 million in aggregate principal amount of Series 2021-A Class A solar loan-backed notes and $38.6 million in aggregate principal amount of Series 2021-A Class B solar loan-backed notes (collectively, the "HELV Notes") with a maturity date of February 2048. The HELV Notes were issued at a discount of 0.001% for Class A and 2.487% for Class B and bear interest at an annual rate of 1.80% and 3.15% for the Class A and Class B notes, respectively. The cash flows generated by these solar loans are used to service the monthly principal and interest payments on the HELV Notes and satisfy HELV's expenses, and any remaining cash can be distributed to Sunnova Helios V Depositor, LLC, HELV's sole member. In connection with the HELV Notes, certain of our affiliates receive a fee for managing and servicing the solar energy systems pursuant to management and service agreements. In addition, Sunnova Energy Corporation has guaranteed, among other things, (a) the obligations of certain of our subsidiaries to manage and service the solar energy systems pursuant to management and servicing agreements and (b) certain of our subsidiaries' obligations to repurchase or substitute certain ineligible solar loans eventually sold to HELV pursuant to the related sale and contribution agreement. HELV is also required to maintain certain reserve accounts for the benefit of the holders of the HELV Notes, each of which must be funded at all times to the levels specified in the HELV Notes. The holders of the HELV Notes have no recourse to our other assets except as expressly set forth in the HELV Notes.

SOLIII Debt. In June 2021, we pooled and transferred eligible solar energy systems and the related asset receivables into wholly-owned subsidiaries of SOLIII, a special purpose entity, that issued $319.0 million in aggregate principal amount of

Series 2021-1 solar asset-backed notes (the "SOLIII Notes") with a maturity date of April 2056. The SOLIII Notes were issued at a discount of 0.04% and bear interest at an annual rate equal to 2.58%. The cash flows generated by the solar energy systems of SOLIII's subsidiaries are used to service the quarterly principal and interest payments on the SOLIII Notes and satisfy SOLIII's expenses, and any remaining cash can be distributed to Sunnova Sol III Depositor, LLC, SOLIII's sole member. In connection with the SOLIII Notes, certain of our affiliates receive a fee for managing and servicing the solar energy systems pursuant to a transaction management agreement and managing and servicing agreements. In addition, Sunnova Energy Corporation has guaranteed (a) the obligations of certain of our subsidiaries to manage and service the solar energy systems pursuant to management, servicing and transaction management agreements, (b) the managing members' obligations, in such capacity, under the related financing fund's limited liability company agreement and (c) certain of our subsidiaries' obligations to repurchase or substitute certain ineligible solar energy systems eventually sold to SOLIII pursuant to the sale and contribution agreement. SOLIII is also required to maintain certain reserve accounts for the benefit of the holders of the SOLIII Notes, each of which must remain funded at all times to the levels specified in the SOLIII Notes. The indenture requires SOLIII to track the debt service coverage ratio (such ratio, the "DSCR") of (a) the amount of certain payments received from customers, certain performance based incentives, certain energy credits and any applicable insurance proceeds as of a specific date to (b) interest and scheduled principal due on the SOLIII Notes as of such date, with the potential to enter into an early amortization period if the DSCR drops below a certain threshold. The holders of the SOLIII Notes have no recourse to our other assets except as expressly set forth in the SOLIII Notes.

HELVI Debt. In July 2021, we pooled and transferred eligible solar loans and the related receivables into HELVI, a special purpose entity, that issued $106.2 million in aggregate principal amount of Series 2021-B Class A solar loan-backed notes and $106.2 million in aggregate principal amount of Series 2021-B Class B solar loan-backed notes (collectively, the "HELVI Notes") with a maturity date of July 2048. The HELVI Notes were issued at a discount of 0.01% for Class A and 0.04% for Class B and bear interest at an annual rate of 1.62% and 2.01% for the Class A and Class B notes, respectively. The cash flows generated by these solar loans are used to service the monthly principal and interest payments on the HELVI Notes and satisfy HELVI's expenses, and any remaining cash can be distributed to Sunnova Helios VI Depositor, LLC, HELVI's sole member. In connection with the HELVI Notes, certain of our affiliates receive a fee for managing and servicing the solar energy systems pursuant to management and service agreements. In addition, Sunnova Energy Corporation has guaranteed, among other things, (a) the obligations of certain of our subsidiaries to manage and service the solar energy systems pursuant to management and servicing agreements and (b) certain of our subsidiaries' obligations to repurchase or substitute certain ineligible solar loans eventually sold to HELVI pursuant to the related sale and contribution agreement. HELVI is also required to maintain certain reserve accounts for the benefit of the holders of the HELVI Notes, each of which must be funded at all times to the levels specified in the HELVI Notes. The holders of the HELVI Notes have no recourse to our other assets except as expressly set forth in the HELVI Notes.

HELVII Debt. In October 2021, we pooled and transferred eligible solar loans and the related receivables into HELVII, a special purpose entity, that issued $68.4 million in aggregate principal amount of Series 2021-C Class A solar loan-backed notes, $55.9 million in aggregate principal amount of Series 2021-C Class B solar loan-backed notes and $31.5 million in aggregate principal amount of Series 2021-C Class C solar loan-backed notes (collectively, the "HELVII Notes") with a maturity date of October 2048. The HELVII Notes were issued at a discount of 0.04% for Class A, 0.03% for Class B and 0.01% for Class C and bear interest at an annual rate of 2.03%, 2.33% and 2.63% for the Class A, Class B and Class C notes, respectively. The cash flows generated by these solar loans are used to service the monthly principal and interest payments on the HELVII Notes and satisfy HELVII's expenses, and any remaining cash can be distributed to Sunnova Helios VII Depositor, LLC, HELVII's sole member. In connection with the HELVII Notes, certain of our affiliates receive a fee for managing and servicing the solar energy systems pursuant to management and service agreements. In addition, Sunnova Energy Corporation has guaranteed, among other things, (a) the obligations of certain of our subsidiaries to manage and service the solar energy systems pursuant to management and servicing agreements and (b) certain of our subsidiaries' obligations to repurchase or substitute certain ineligible solar loans eventually sold to HELVII pursuant to the related sale and contribution agreement. HELVII is also required to maintain certain reserve accounts for the benefit of the holders of the HELVII Notes, each of which must be funded at all times to the levels specified in the HELVII Notes. The holders of the HELVII Notes have no recourse to our other assets except as expressly set forth in the HELVII Notes.

HELVIII Debt. In February 2022, we pooled and transferred eligible solar loans and the related receivables into HELVIII, a special purpose entity, that issued $131.9 million in aggregate principal amount of Series 2022-A Class A solar loan-backed notes, $102.2 million in aggregate principal amount of Series 2022-A Class B solar loan-backed notes and $63.8 million in aggregate principal amount of Series 2022-A Class C solar loan-backed notes (collectively, the "HELVIII Notes") with a maturity date of February 2049. The HELVIII Notes were issued at a discount of 1.55% for Class A, 2.23% for Class B and 2.62% for Class C and bear interest at an annual rate of 2.79%, 3.13% and 3.53% for the Class A, Class B and Class C notes, respectively. The cash flows generated by these solar loans are used to service the monthly principal and interest payments on the HELVIII Notes and satisfy HELVIII's expenses, and any remaining cash can be distributed to Sunnova Helios

VIII Depositor, LLC, HELVIII's sole member. In connection with the HELVIII Notes, certain of our affiliates receive a fee for managing and servicing the solar energy systems pursuant to management and service agreements. In addition, Sunnova Energy Corporation has guaranteed, among other things, (a) the obligations of certain of our subsidiaries to manage and service the solar energy systems pursuant to management and servicing agreements and (b) certain of our subsidiaries' obligations to repurchase or substitute certain ineligible solar loans eventually sold to HELVIII pursuant to the related sale and contribution agreement. HELVIII is also required to maintain certain reserve accounts for the benefit of the holders of the HELVIII Notes, each of which must be funded at all times to the levels specified in the HELVIII Notes. The holders of the HELVIII Notes have no recourse to our other assets except as expressly set forth in the HELVIII Notes.

SOLIV Debt. In June 2022, we pooled and transferred eligible solar energy systems and the related asset receivables into wholly-owned subsidiaries of SOLIV, a special purpose entity, that issued $317.0 million in aggregate principal amount of Series 2022-1 Class A solar asset-backed notes and $38.0 million in aggregate principal amount of Series 2022-1 Class B solar asset-backed notes (collectively, the "SOLIV Notes") with a maturity date of April 2057. The SOLIV Notes were issued at a discount of 3.55% and 2.10%, respectively, and bear interest at an annual rate equal to 4.95% and 6.35% for the Class A and Class B notes, respectively. The cash flows generated by the solar energy systems of SOLIV's subsidiaries are used to service the quarterly principal and interest payments on the SOLIV Notes and satisfy SOLIV's expenses, and any remaining cash can be distributed to Sunnova Sol IV Depositor, LLC, SOLIV's sole member. In connection with the SOLIV Notes, certain of our affiliates receive a fee for managing and servicing the solar energy systems pursuant to a transaction management agreement and management and servicing agreements. In addition, Sunnova Energy Corporation has guaranteed (a) the obligations of certain of our subsidiaries to manage and service the solar energy systems pursuant to a transaction management agreement and management and servicing agreements, (b) the managing members' obligations, in such capacity, under the related financing fund's limited liability company agreement and (c) certain of our subsidiaries' obligations to repurchase or substitute certain ineligible solar energy systems eventually sold to SOLIV pursuant to the sale and contribution agreement. SOLIV is also required to maintain certain reserve accounts for the benefit of the holders of the SOLIV Notes, each of which must remain funded at all times to the levels specified in the SOLIV Notes. The indenture requires SOLIV to track the debt service coverage ratio (such ratio, the "DSCR") of (a) the amount of certain payments received from customers, certain performance based incentives, certain energy credits and any applicable insurance proceeds as of a specific date to (b) interest and scheduled principal due on the SOLIV Notes as of such date, with the potential to enter into an early amortization period if the DSCR drops below a certain threshold. The holders of the SOLIV Notes have no recourse to our other assets except as expressly set forth in the SOLIV Notes.

HELIX Debt. In August 2022, we pooled and transferred eligible solar loans and the related receivables into HELIX, a special purpose entity, that issued $178.0 million in aggregate principal amount of Series 2022-B Class A solar loan-backed notes and $49.7 million in aggregate principal amount of Series 2022-B Class B solar loan-backed notes (collectively, the "HELIX Notes") with a maturity date of August 2049. The HELIX Notes were issued at a discount of 0.69% for Class A and 5.10% for Class B and bear interest at an annual rate of 5.00% and 6.00% for the Class A and Class B notes, respectively. The cash flows generated by these solar loans are used to service the monthly principal and interest payments on the HELIX Notes and satisfy HELIX's expenses, and any remaining cash can be distributed to Sunnova Helios IX Depositor, LLC, HELIX's sole member. In connection with the HELIX Notes, certain of our affiliates receive a fee for managing and servicing the solar energy systems pursuant to management and service agreements. In addition, Sunnova Energy Corporation has guaranteed, among other things, (a) the obligations of certain of our subsidiaries to manage and service the solar energy systems pursuant to management and servicing agreements and (b) certain of our subsidiaries' obligations to repurchase or substitute certain ineligible solar loans eventually sold to HELIX pursuant to the related sale and contribution agreement. HELIX is also required to maintain certain reserve accounts for the benefit of the holders of the HELIX Notes, each of which must be funded at all times to the levels specified in the HELIX Notes. The holders of the HELIX Notes have no recourse to our other assets except as expressly set forth in the HELIX Notes.

HELX Debt. In November 2022, we pooled and transferred eligible solar loans and the related receivables into HELX, a special purpose entity, that issued $103.4 million in aggregate principal amount of Series 2022-C Class A solar loan-backed notes, $80.6 million in aggregate principal amount of Series 2022-C Class B solar loan-backed notes and $51.7 million in aggregate principal amount of Series 2022-C Class C solar loan-backed notes (collectively, the "HELX Notes") with a maturity date of November 2049. The HELX Notes were issued at a discount of 5.38% for Class A, 8.98% for Class B and 14.74% for Class C and bear interest at an annual rate of 5.30%, 5.60% and 6.00% for the Class A, Class B and Class C notes, respectively. The cash flows generated by these solar loans are used to service the monthly principal and interest payments on the HELX Notes and satisfy HELX's expenses, and any remaining cash can be distributed to Sunnova Helios X Depositor, LLC, HELX's sole member. In connection with the HELX Notes, certain of our affiliates receive a fee for managing and servicing the solar energy systems pursuant to management and service agreements. In addition, Sunnova Energy Corporation has guaranteed, among other things, (a) the obligations of certain of our subsidiaries to manage and service the solar energy systems pursuant to management and servicing agreements and (b) certain of our subsidiaries' obligations to repurchase or substitute certain ineligible solar loans eventually sold to HELX pursuant to the related sale and contribution agreement. HELX is also required to maintain certain reserve accounts for the benefit of the holders of the HELX Notes, each of which must be funded at all times to the levels specified in the HELX Notes. The holders of the HELX Notes have no recourse to our other assets except as expressly set forth in the HELX Notes.

IS Debt. In March 2023, IS entered into a secured revolving credit facility with Texas Capital Bank, as agent, and the lenders party thereto, for an aggregate commitment amount of $50.0 million with a maturity date of the earlier of (a) March 2026 and (b) six months from the latest maturity date of any material parent credit facility (defined as a parent credit facility with a commitment amount of $250.0 million or more that, if terminated could individually be expected to result in a liquidity event (as defined by the IS revolving credit facility)). The proceeds of the loans under the IS revolving credit facility are available to purchase or otherwise acquire certain accounts receivable and inventory, fund certain reserve accounts that are required to be maintained by IS in accordance with the revolving credit agreement and pay fees and expenses incurred in connection with the IS revolving credit facility. Interest on the borrowings under the IS revolving credit facility is due monthly. Borrowings under the IS revolving credit facility bear interest at an annual rate based on Term SOFR (as defined by the IS revolving credit facility).

SOLV Debt. In April 2023, we pooled and transferred eligible solar energy systems and the related asset receivables into wholly-owned subsidiaries of SOLV, a special purpose entity, that issued $300.0 million in aggregate principal amount of Series 2023-1 Class A solar asset-backed notes and $23.5 million in aggregate principal amount of Series 2023-1 Class B solar asset-backed notes (collectively, the "SOLV Notes") with a maturity date of April 2058. The SOLV Notes were issued at a discount of 5.01% and 11.63% for the Class A and Class B notes, respectively, and bear interest at an annual rate equal to 5.40% and 7.35% for the Class A and Class B notes, respectively. The cash flows generated by the solar energy systems of SOLV's subsidiaries are used to service the quarterly principal and interest payments on the SOLV Notes and satisfy SOLV's expenses, and any remaining cash can be distributed to Sunnova Sol V Depositor, LLC, SOLV's sole member. In connection with the SOLV Notes, certain of our affiliates receive a fee for managing and servicing the solar energy systems pursuant to a transaction management agreement and management and servicing agreements. In addition, Sunnova Energy Corporation has guaranteed (a) the obligations of certain of our subsidiaries to manage and service the solar energy systems pursuant to a transaction management agreement and management and servicing agreements, (b) the managing members' obligations, in such capacity, under the related financing fund's limited liability company agreement and (c) certain of our subsidiaries' obligations to repurchase or substitute certain ineligible solar energy systems eventually sold to SOLV pursuant to the sale and contribution agreement. SOLV is also required to maintain certain reserve accounts for the benefit of the holders of the SOLV Notes, each of which must remain funded at all times to the levels specified in the SOLV Notes. The indenture requires SOLV to track the debt service coverage ratio (such ratio, the "DSCR") of (a) the amount of certain payments received from customers, certain performance based incentives, certain energy credits and any applicable insurance proceeds as of a specific date to (b) interest and scheduled principal due on the SOLV Notes as of such date, with the potential to enter into an early amortization period if the DSCR drops below a certain threshold. The holders of the SOLV Notes have no recourse to our other assets except as expressly set forth in the SOLV Notes.

HELXI Debt. In May 2023, we pooled and transferred eligible solar loans and the related receivables into HELXI, a special purpose entity, that issued $174.9 million in aggregate principal amount of Series 2023-A Class A solar loan-backed notes, $80.1 million in aggregate principal amount of Series 2023-A Class B solar loan-backed notes and $31.7 million in aggregate principal amount of Series 2023-A Class C solar loan-backed notes (collectively, the "HELXI Notes") with a maturity date of May 2050. The HELXI Notes were issued at a discount of 2.57% for Class A, 5.31% for Class B and 13.56% for Class C and bear interest at an annual rate of 5.30%, 5.60% and 6.00% for the Class A, Class B and Class C notes, respectively. The cash flows generated by these solar loans are used to service the monthly principal and interest payments on the HELXI Notes and satisfy HELXI's expenses, and any remaining cash can be distributed to Sunnova Helios XI Depositor, LLC, HELXI's sole member. In connection with the HELXI Notes, certain of our affiliates receive a fee for managing and servicing the solar energy systems pursuant to management and service agreements. In addition, Sunnova Energy Corporation has guaranteed, among other things, (a) the obligations of certain of our subsidiaries to manage and service the solar energy systems pursuant to management and servicing agreements and (b) certain of our subsidiaries' obligations to repurchase or substitute certain ineligible solar loans eventually sold to HELXI pursuant to the related sale and contribution agreement. HELXI is also required to maintain certain reserve accounts for the benefit of the holders of the HELXI Notes, each of which must be funded at all times to the levels specified in the HELXI Notes. The holders of the HELXI Notes have no recourse to our other assets except as expressly set forth in the HELXI Notes.

HELXII Debt. In August 2023, we pooled and transferred eligible solar loans and the related receivables into HELXII, a special purpose entity, that issued $148.5 million in aggregate principal amount of Series 2023-B Class A solar loan-backed notes, $71.1 million in aggregate principal amount of Series 2023-B Class B solar loan-backed notes and $23.1 million in aggregate principal amount of Series 2023-B Class C solar loan-backed notes (collectively, the "HELXII Notes") with a maturity date of August 2050. The HELXII Notes were issued at a discount of 4.23% for Class A, 6.67% for Class B and 12.64% for Class C and bear interest at an annual rate of 5.30%, 5.60% and 6.00% for the Class A, Class B and Class C notes, respectively. The cash flows generated by these solar loans are used to service the monthly principal and interest payments on the HELXII Notes and satisfy HELXII's expenses, and any remaining cash can be distributed to Sunnova Helios XII Depositor, LLC, HELXII's sole member. In connection with the HELXII Notes, certain of our affiliates receive a fee for managing and servicing the solar energy systems pursuant to management and service agreements. In addition, Sunnova Energy Corporation has guaranteed, among other things, (a) the obligations of certain of our subsidiaries to manage and service the solar energy systems pursuant to management and servicing agreements and (b) certain of our subsidiaries' obligations to repurchase or substitute certain ineligible solar loans eventually sold to HELXII pursuant to the related sale and contribution agreement. HELXII is also required to maintain certain reserve accounts for the benefit of the holders of the HELXII Notes, each of which must be funded at all times to the levels specified in the HELXII Notes. The holders of the HELXII Notes have no recourse to our other assets except as expressly set forth in the HELXII Notes.

AP9 Debt. In September 2023, AP9 entered into a secured revolving credit facility with Citibank, N.A., as administrative agent, and the lenders party thereto, for an aggregate commitment amount of $65.0 million, subject to a borrowing base calculated based on the sum of a specified advance rate applied to the net aggregate balance of the home improvement loans securing the AP9 revolving credit facility, with a maturity date of October 2027. The proceeds of the loans under the AP9 revolving credit facility are available for funding the purchase of home improvement loans and the related home improvement assets, fund certain reserve accounts that are required to be maintained by AP9 in accordance with the AP9 revolving credit facility and pay fees and expenses incurred in connection with the AP9 revolving credit facility. Interest on the borrowings under the AP9 revolving credit facility is due monthly. Borrowings under the AP9 revolving credit facility bear interest at an annual rate based on Term SOFR (as defined by the AP9 revolving credit facility) plus a margin specific to each lender. In connection with the AP9 revolving credit facility, one of our affiliates receives a fee for servicing the home improvement loans and related home improvement assets pursuant to a servicing agreement. In addition, Sunnova Energy Corporation guarantees (a) the servicer's obligations to service the home improvement loans and related home improvement assets pursuant to the servicing agreement, (b) some of the obligations of Sunnova Asset Portfolio 9 Holdings, LLC, a Delaware limited liability company ("AP9H") pursuant to that certain sale and contribution agreement between AP9H and AP9, which include specified indemnity obligations and refund obligations for certain breaches of representations and warranties in respect of the home improvement loans, (c) AP9H's obligations to repurchase or substitute certain ineligible home improvement loans or cure a defective home improvement loan sold to AP9 pursuant to the sale and contribution agreement and (d) certain indemnification obligations related to its affiliates in connection with the AP9 revolving credit facility, but does not provide a general guarantee of AP9's obligations under the AP9 revolving credit facility or of the creditworthiness of the assets of AP9 pledged as the collateral for the AP9 revolving credit facility. Under the limited guarantee, Sunnova Energy Corporation is subject to certain financial covenants regarding tangible net worth, working capital and restrictions on the use of proceeds from the AP9 revolving credit facility. Obligations of AP9 under the AP9 revolving credit facility are secured by first priority liens on substantially all of the assets of AP9. Certain obligations of AP9H under the sale and contribution agreement are secured by a first priority lien on the equity of AP9 owned by AP9H.

HESI Debt. In October 2023, we entered into a note purchase agreement, which will indirectly benefit from a partial guarantee provided by the U.S. Department of Energy ("DOE") Loan Programs Office. The notes will not be directly guaranteed by the DOE. The offering consists of $219.6 million in aggregate principal amount of Series 2023-GRID1 Class A solar loan-backed notes and $24.4 million in aggregate principal amount of Series 2023-GRID1 Class B solar loan-backed notes (collectively, the "HESI Notes") with a maturity date of December 2050. The HESI Notes were issued at a discount of 2.46% for Class A and 9.40% for Class B and bear interest at an annual rate of 5.75% and 8.25% for the Class A and Class B notes, respectively.

BMB Debt. In December 2023, BMB, along with its two wholly-owned subsidiaries, entered into a secured revolving credit facility with Mitsubishi HC Capital America, Inc., as administrative agent, and the lenders party thereto from time to time, for an aggregate principal amount of up to $25.0 million with a maturity date, for each loan thereunder, as set forth in the BMB revolving credit facility and, in any event, no later than December 27, 2025 (after giving effect to any extension thereof pursuant to that aforementioned BMB revolving credit facility). The proceeds of the loans under the BMB revolving credit facility are available to, among other things, finance project costs related to commercial, industrial and other solar energy systems and energy storage systems owned by BMB or one of its subsidiaries or by a customer (each, a "Project"). The BMB revolving credit facility is also available to finance completed Projects. Interest on the borrowings under the BMB revolving credit facility is due monthly (or, in the case of borrowings for construction loans, paid in kind monthly). Borrowings under the BMB revolving credit facility bear interest at an annual rate (which can vary for different Projects) based on Term SOFR plus a specified margin or, in the case of certain term loans for completed Projects, a fixed margin. In connection with the BMB revolving credit facility, certain of our affiliates receive fees for managing and servicing the Projects pursuant to certain management and servicing agreements. In addition, Sunnova Energy Corporation guarantees the obligations of certain of its affiliates under those certain management agreements, servicing agreements, a sale and contribution agreement and a development and purchase agreement, along with reasonable and documented out-of-pocket expenses incurred by BMB or the administrative agent in enforcing their respective rights thereunder, but does not provide a general guarantee of BMB's obligations under the BMB revolving credit facility or of the creditworthiness of the assets of BMB and its wholly-owned subsidiaries that are pledged as collateral for the BMB revolving credit facility. As of December 31, 2023, no borrowings have been made from the BMB revolving credit facility.

Fair Values of Long-Term Debt. The fair values of our long-term debt and the corresponding carrying amounts are as follows:

	As of December 31,			
	2023		2022	
	Carrying Value	Estimated Fair Value	Carrying Value	Estimated Fair Value
	(in thousands)			
SEI 0.25% convertible senior notes	$ 575,000	$ 528,927	$ 575,000	$ 511,733
SEI 2.625% convertible senior notes	600,000	582,463	600,000	574,693
Sunnova Energy Corporation notes payable	3,084	3,084	—	—
Sunnova Energy Corporation 5.875% senior notes	400,000	369,522	400,000	359,283
Sunnova Energy Corporation 11.75% senior notes	400,000	411,996	—	—
EZOP revolving credit facility	511,000	511,000	500,000	500,000
HELII solar asset-backed notes	203,998	198,590	212,648	206,045
RAYSI solar asset-backed notes	111,445	102,480	115,835	104,594
HELIII solar loan-backed notes	96,215	87,982	104,685	93,706
TEPH revolving credit facility	1,036,600	1,036,600	425,700	425,700
SOLI solar asset-backed notes	348,839	310,928	365,025	313,174
HELIV solar loan-backed notes	108,312	96,603	117,149	100,913
AP8 revolving credit facility	215,000	215,000	75,000	75,000
SOLII solar asset-backed notes	229,150	192,589	238,685	189,728
HELV solar loan-backed notes	147,969	132,533	158,307	135,408
SOLIII solar asset-backed notes	273,307	235,318	292,411	237,425
HELVI solar loan-backed notes	173,422	153,836	184,439	157,289
HELVII solar loan-backed notes	133,715	120,413	142,914	124,476
HELVIII solar loan-backed notes	263,015	241,599	281,113	252,483
SOLIV solar asset-backed notes	334,076	325,816	346,331	334,335
HELIX solar loan-backed notes	211,420	203,375	223,469	210,070
HELX solar loan-backed notes	220,838	221,655	180,636	183,165
IS revolving credit facility	31,300	31,300	—	—
SOLV solar asset-backed notes	320,619	317,481	—	—
HELXI solar loan-backed notes	278,491	275,323	—	—
HELXII solar loan-backed notes	236,924	242,091	—	—
AP9 revolving credit facility	12,118	12,118	—	—
HESI solar loan-backed notes	240,057	249,318	—	—
Total (1)	$ 7,715,914	$ 7,409,940	$ 5,539,347	$ 5,089,220

(1) Amounts exclude the net deferred financing costs (classified as debt) and net debt discounts of $201.7 million and $130.2 million as of December 31, 2023 and 2022, respectively.

For the notes payable, EZOP, TEPH, AP8, IS and AP9 debt, the estimated fair values approximate the carrying amounts primarily due to the variable nature of the interest rates of the underlying instruments. For the convertible senior notes, senior notes and the HELII, RAYSI, HELIII, SOLI, HELIV, SOLII, HELV, SOLIII, HELVI, HELVII, HELVIII, SOLIV, HELIX, HELX, SOLV, HELXI, HELXII and HESI debt, we determined the estimated fair values based on an analysis of debt with similar book values, maturities and required market yields based on current interest rates.

Principal Maturities of Long-Term Debt. As of December 31, 2023, the principal maturities of our long-term debt were as follows:

	Principal Maturities of Long-Term Debt
	(in thousands)
2024	$ 483,497
2025	1,782,383
2026	1,226,422
2027	222,438
2028	1,239,106
2029 and thereafter	2,762,068
Total	$ 7,715,914

(10) Derivative Instruments

Interest Rate Swaps and Caps on EZOP Debt. During the years ended December 31, 2023 and 2022, EZOP entered into interest rate swaps and caps for an aggregate notional amount of $1.1 billion and $506.6 million, respectively, to economically hedge its exposure to the variable interest rates on a portion of the outstanding EZOP debt. No collateral was posted for the interest rate swaps and caps as they are secured under the EZOP revolving credit facility. In August 2023, the notional amount of the interest rate swaps and caps began decreasing to match EZOP's estimated monthly principal payments on the debt. During the years ended December 31, 2023 and 2022, EZOP unwound interest rate swaps and caps with an aggregate notional amount of $798.0 million and $360.2 million, respectively, and recorded a realized gain of $45.8 million and $22.9 million, respectively.

Interest Rate Swaps and Caps on TEPH Debt. During the years ended December 31, 2023 and 2022, TEPH entered into interest rate swaps and caps for an aggregate notional amount of $851.6 million and $524.9 million, respectively, to economically hedge its exposure to the variable interest rates on a portion of the outstanding TEPH debt. No collateral was posted for the interest rate swaps and caps as they are secured under the TEPH revolving credit facility. In October 2023, the notional amount of the interest rate swaps and caps began decreasing to match TEPH's estimated quarterly principal payments on the debt. During the years ended December 31, 2023 and 2022, TEPH unwound interest rate swaps and caps with an aggregate notional amount of $241.1 million and $515.4 million, respectively, and recorded a realized gain of $9.7 million and $28.3 million, respectively.

Interest Rate Swaps and Caps on AP8 Debt. During the years ended December 31, 2023 and 2022, AP8 entered into interest rate swaps and caps for an aggregate notional amount of $140.0 million and $75.0 million, respectively, to economically hedge its exposure to the variable interest rates on a portion of the outstanding AP8 debt. No collateral was posted for the interest rate swaps and caps as they are secured under the AP8 revolving credit facility. The notional amount of the interest rate swaps and caps is locked for the life of the contract. During the years ended December 31, 2023 and 2022, AP8 unwound interest rate swaps and caps with an aggregate notional amount of $0 and recorded a realized gain of $1.1 million and $0, respectively.

Interest Rate Swaps and Caps on AP9 Debt. During the years ended December 31, 2023 and 2022, AP9 entered into interest rate swaps and caps for an aggregate notional amount of $25.0 million and $0, respectively, to economically hedge its exposure to the variable interest rates on a portion of the outstanding AP9 debt. No collateral was posted for the interest rate swaps and caps as they are secured under the AP9 revolving credit facility. In September 2025, the notional amount of the interest rate swaps and caps will begin decreasing to match AP9's estimated monthly principal payments on the debt. During the years ended December 31, 2023 and 2022, AP9 unwound interest rate swaps and caps with an aggregate notional amount of $0 and recorded a realized gain of $62,000 and $0, respectively.

The following table presents a summary of the outstanding derivative instruments:

	As of December 31,							
	2023				2022			
	Effective Date	Termination Date	Fixed Interest Rate	Aggregate Notional Amount	Effective Date	Termination Date	Fixed Interest Rate	Aggregate Notional Amount
	(in thousands, except interest rates)							
EZOP	July 2023 - December 2023	December 2028 - November 2035	2.000%	$ 489,581	June 2022 - July 2022	July 2034	0.890%	$ 489,477
TEPH	July 2022 - December 2023	October 2031 - October 2041	2.620% - 4.202%	994,403	July 2022 - December 2022	January 2035 - April 2041	1.520% - 2.630%	383,749
AP8	November 2022 - August 2023	September 2025	4.250%	215,000	November 2022	September 2025	4.250%	75,000
AP9	September 2023	September 2027	4.250%	25,000				—
Total				$ 1,723,984				$ 948,226

The following table presents the fair value of the interest rate swaps and caps as recorded in the consolidated balance sheets:

	As of December 31,	
	2023	2022
	(in thousands)	
Other assets	$ 55,471	$ 112,712

We did not designate the interest rate swaps and caps as hedging instruments for accounting purposes. As a result, we recognize changes in fair value immediately in interest expense, net. The following table presents the impact of the interest rate swaps and caps as recorded in the consolidated statements of operations:

	Year Ended December 31,		
	2023	2022	2021
	(in thousands)		
Realized (gain) loss	$ (56,623)	$ (51,207)	$ 2,306
Unrealized (gain) loss	67,318	(19,451)	(4,874)
Total	$ 10,695	$ (70,658)	$ (2,568)

(11) Income Taxes

Our effective income tax rate is 0%, (3)% and 0% for the years ended December 31, 2023, 2022 and 2021, respectively. Total income tax differs from the amounts computed by applying the statutory income tax rate to loss before income tax primarily as a result of our valuation allowance. The sources of these differences are as follows:

	Year Ended December 31,		
	2023	2022	2021
		(in thousands)	
Loss before income tax	$ (503,449)	$ (126,390)	$ (147,250)
Statutory federal tax rate	21%	21%	21%
Tax benefit computed at statutory rate	(105,724)	(26,542)	(30,923)
State income tax, net of federal benefit	14,804	(3,167)	(2,399)
Adjustments from permanent differences:			
ITC sales	(15,893)	—	—
Redeemable noncontrolling interests and noncontrolling interests	17,738	(6,587)	1,970
ITC recapture	—	101	82
Other	4,179	1,992	1,054
Increase in valuation allowance, net	83,873	38,089	30,476
Total income tax (benefit) expense	$ (1,023)	$ 3,886	$ 260

State, federal and foreign income tax (benefit) expense is $(1.0) million, $3.9 million and $260,000 for the years ended December 31, 2023, 2022 and 2021, respectively. The tax effects of temporary differences that give rise to significant portions of the deferred tax assets (liabilities) are as follows:

	As of December 31,	
	2023	2022
	(tax effected, in thousands)	
Federal net operating loss carryforward	$ 238,447	$ 261,837
State net operating loss carryforward	60,980	61,141
ITC carryforward	309,693	285,614
Foreign tax credit carryforward	18,087	—
Federal unused interest deduction carryforward	49,979	45,750
Equity-based compensation	22,935	16,701
Deferred revenue	7,433	6,123
Unrealized loss on derivatives	(17,119)	(32,459)
Investment in certain financing arrangements	150,476	154,635
Amortization of intangible assets	—	12,730
Other deferred tax assets	48,619	30,606
Deferred tax assets	889,530	842,678
Fixed asset basis difference	(627,290)	(394,082)
Intangible asset basis difference	(30,921)	(54,196)
Investment in certain financing arrangements	—	(135,181)
Other deferred tax liabilities	(4,259)	(7,095)
Deferred tax liabilities	(662,470)	(590,554)
Valuation allowance	(227,414)	(252,124)
Net deferred tax liability	$ (354)	$ —

A valuation allowance of $227.4 million and $252.1 million was recorded against our net deferred tax assets as of December 31, 2023 and 2022, respectively. We believe it is not more likely than not that future taxable income and the reversal of deferred tax liabilities will be sufficient to realize our net deferred tax assets. Our estimated federal tax net operating loss carryforward as of December 31, 2023 is approximately $1.1 billion, which will begin to expire in 2035 if not utilized. We also generated $28.2 million of Section 48(a) ITCs in 2023 for a net $309.7 million through December 31, 2023, which will begin to expire in 2033 if not utilized.

We assessed whether we had any significant uncertain tax positions taken in a filed tax return, planned to be taken in a future tax return or claim, or otherwise subject to interpretation and determined there were none not more likely than not to be sustained upon examination, including resolution of any related appeals or litigation processes, based on the technical merits of the position, or prospectively approved when such approval may be sought in advance. Should a provision for any interest or penalties relative to unrecognized tax benefits be necessary, it is our policy to accrue for such in our income tax accounts. There were no such accruals as of December 31, 2023 and 2022 and we do not expect a significant change in gross unrecognized tax benefits in the next twelve months. Our tax years after 2012 remain subject to examination by the IRS and by the taxing authorities in the states and territories in which we operate.

Under the provisions of the Internal Revenue Code and similar state provisions, our net operating loss carryforwards and tax credit carryforwards are subject to review and possible adjustment by the IRS and state tax authorities. Under Sections 382 and 383 of the Internal Revenue Code, as well as similar state provisions, our net operating loss and tax credit carryforwards may be subject to an annual limitation in the event of certain cumulative changes in the ownership interest of certain significant shareholders over a three-year period in excess of 50%. This could limit the amount of tax attributes that can be utilized annually to offset future taxable income or tax liabilities. The amount of the annual limitation is determined based on the value of our company immediately prior to the ownership change. Subsequent ownership changes may further affect the limitation in future years. We experienced an ownership change in August 2020 as defined by Sections 382 and 383 of the Internal Revenue Code, which limits our future ability to utilize NOLs and tax credits generated before the "ownership change". However, these limitations do not prevent the use of our NOLs to offset certain built-in gains, including deemed gains with respect to our cost recovery deductions, recognized by us within five years after the ownership change with respect to assets held by us at the time of the ownership change, or the use of our tax credits to offset related tax liabilities, to the extent of our "net unrealized built-in gain" at the time of the ownership change. We have determined that, based upon the size of our net unrealized built-in gain at the time of our 2020 ownership change and our projected recognition of deemed built-in gains in the five years following the ownership change, there is no impact on the balances for deferred taxes or valuation allowance.

We conduct operations in the U.S. territories of Puerto Rico, Guam and the Commonwealth of the Northern Mariana Islands. As a result, our income tax expense includes the effects of taxes incurred in such jurisdictions where the tax code for the respective jurisdiction may have separate tax-reporting requirements.

In August 2022, the Inflation Reduction Act of 2022 (the "IRA") was signed into law. Among other things, the IRA expanded and extended the tax credits available to solar energy projects in an effort to achieve President Biden's non-binding target of net-zero emissions by 2050. The IRA extends the investment tax credit for eligible solar energy projects through at least 2033 and, depending on the location of a particular project, its size, its ability to satisfy certain labor and domestic content requirements and the category of consumers it serves, the investment tax credit percentage can range between 6% and 70%.

(12) Acquisitions

In February 2021, we entered into an Agreement and Plan of Merger (the "Merger Agreement") with certain of our subsidiaries, SunStreet Energy Group, LLC, a Delaware limited liability company ("SunStreet") and LEN X, LLC, a Florida limited liability company, the sole member of SunStreet and a wholly-owned subsidiary of Lennar Corporation ("Len^{x}"). Pursuant to the Merger Agreement, in April 2021, we acquired SunStreet, Lennar Corporation's ("Lennar") residential solar platform, in exchange for up to 7,011,751 shares of our common stock (the "Acquisition"), comprised of 3,095,329 shares in initial consideration issued at closing, 27,526 shares related to the purchase price adjustments in the third quarter of 2021 and up to 3,888,896 shares issuable as earnout consideration after closing of the Acquisition as described below. We believe the Acquisition provides a new strategic path to further scale our solar business, reduces customer acquisition costs, provides a multi-year supply of sites through the development of new solar communities and allows us to pursue the development of clean and resilient microgrids across the U.S.

The purchase consideration was approximately $218.6 million, consisting of $128.2 million in the issuance of common stock shares and $90.4 million representing the fair value of contingent consideration based upon estimated new solar energy system installations through 2025 and the execution of certain binding agreements before the fifth anniversary of the closing of the Acquisition. Pursuant to the Earnout Agreement entered into between us and Len^{x}, Len^{x} will have the ability to earn up to an additional 3,888,896 shares of common stock over a five-year period in connection with the Acquisition. The earnout payments are conditioned on SunStreet meeting certain commercial milestones and achieving specified in-service levels. There are two elements to the earnout arrangement. First, we will issue up to 2,777,784 shares to the extent we and our subsidiaries (including SunStreet) place target amounts of solar energy systems into service and enter into qualifying customer agreements related to such solar energy systems. The 2,777,784 shares of common stock issuable under this portion of the earnout can be earned in four installments on a yearly basis (if the in-service target for each such year is achieved) or at the end of the four-year period (if the cumulative in-service target is achieved by the fourth and final year), with the annual periods commencing on the closing date of the Acquisition. See Note 14, Stockholders' Equity. This earnout is recorded as contingent consideration. The second element of the earnout is related to the development of microgrid communities. Pursuant to this portion of the earnout, we will issue up to 1,111,112 shares in two separate tranches, each of which has different criteria, if, prior to the fifth anniversary of the closing date of the Acquisition, we enter into binding agreements for the development of microgrid communities. One of these tranches is recorded as contingent consideration. As of December 31, 2023, the amount of contingent consideration that could be paid to Lennar has an estimated maximum value of $31.0 million and a minimum value of $7.2 million. These values were determined based on the projected average share price over the five year earnout period multiplied by the number of shares to be transferred to Lennar if the targets for purchased solar energy systems placed in service are achieved. In connection with the Acquisition, Lennar has committed to contribute an aggregate $200.0 million (the "Funding Commitment") to four Sunnova tax equity funds, each formed annually during a period of four consecutive years (each such year, a "Contribution Year") commencing in 2021. See Note 13, Redeemable Noncontrolling Interests and Noncontrolling Interests. The customer agreements and related solar energy systems acquired by each of these four tax equity funds will generally be originated by SunStreet, though a certain number of customer agreements may be originated by our dealers, subject to certain criteria and expected in-service levels for the year. The favorable terms of the Funding Commitment result in an intangible asset. During the years ended December 31, 2023, 2022 and 2021, we incurred transaction costs of $1.2 million, $7.8 million and $6.7 million related to acquisitions.

The fair values of the assets acquired and liabilities assumed are based on a complex series of judgments about future events and uncertainties and rely heavily on estimates and assumptions. We estimated the fair value of the assets acquired at the acquisition date using a multi-period excess earnings methodology for customer relationships related to system sales and servicing, a cost savings methodology for customer relationships related to new customers, a relief from royalty methodology for the trade name and a discounted cash flow methodology for the tax equity commitment, all using Level 3 inputs.

During the third quarter of 2021, we made changes to our purchase price allocation for facts and circumstances that existed at the acquisition date related to (a) the issuance of additional shares of common stock, (b) changes to the aggregate principal amount of the debt acquired, (c) modifications to the forecasted cash flows for the intangible assets, (d) modifications to the estimated earnout consideration and (e) resulting changes to goodwill. During the third quarter of 2021, we recorded an increase to goodwill of $9.1 million as a result of purchase price adjustments. The following table presents the fair value of the assets acquired and liabilities assumed, inclusive of the purchase price adjustments, with the excess recorded as goodwill:

	As Adjusted
	(in thousands)
Cash	$ 503
Other current assets (includes inventory of $26,835)	33,562
Property and equipment	217
Intangible assets	211,836
Other assets	1,060
Total assets acquired	247,178
Accounts payable	3,762
Accrued expenses	4,580
Current portion of long-term debt	32,301
Other current liabilities	364
Other long-term liabilities	697
Total liabilities assumed	41,704
Net assets acquired, excluding goodwill	205,474
Purchase consideration	218,624
Goodwill	$ 13,150

Goodwill represents the excess of the purchase consideration over the aggregate fair value of the assets acquired and liabilities assumed. Goodwill is primarily attributable to the acquired assembled workforce. We do not expect to take any tax deductions for the goodwill associated with the Acquisition unless we decide to make an asset election in the future that would make a portion of the goodwill deductible for tax purposes. The portion of revenue and earnings associated with the acquired business was not separately identifiable due to the integration with our operations.

(13) Redeemable Noncontrolling Interests and Noncontrolling Interests

The following table summarizes our redeemable noncontrolling interests and noncontrolling interests as of December 31, 2023:

Tax Equity Entity	Balance Sheet Classification	Date Class A Member Admitted
Sunnova TEP II, LLC	Redeemable noncontrolling interests	December 2017
Sunnova TEP II-B, LLC	Redeemable noncontrolling interests	December 2017
Sunnova TEP III, LLC	Redeemable noncontrolling interests	January 2019
Sunnova TEP IV-A, LLC ("TEPIVA")	Noncontrolling interests	August 2019
Sunnova TEP IV-B, LLC ("TEPIVB")	Noncontrolling interests	December 2019
Sunnova TEP IV-C, LLC ("TEPIVC")	Noncontrolling interests	February 2020
Sunnova TEP IV-D, LLC ("TEPIVD")	Noncontrolling interests	May 2020
Sunnova TEP IV-F, LLC	Noncontrolling interests	July 2020
Sunnova TEP IV-E, LLC ("TEPIVE")	Noncontrolling interests	September 2020
Sunnova TEP IV-G, LLC ("TEPIVG")	Noncontrolling interests	November 2020
Sunnova TEP V-D, LLC ("TEPVD")	Noncontrolling interests	April 2021
TEPVA	Noncontrolling interests	April 2021
TEPVB	Noncontrolling interests	May 2021
TEPVC	Noncontrolling interests	July 2021
Sunnova TEP V-E, LLC	Redeemable noncontrolling interests	October 2021
Sunnova TEP 6-A, LLC ("TEP6A")	Noncontrolling interests	December 2021
TEP6B	Noncontrolling interests	February 2022
Sunnova TEP 6-E, LLC	Redeemable noncontrolling interests	May 2022
TEP6D	Noncontrolling interests	September 2022
Sunnova TEP 6-C, LLC ("TEP6C")	Redeemable noncontrolling interests	October 2022
TEP7C	Redeemable noncontrolling interests	November 2022
TEP7A	Noncontrolling interests	December 2022
TEP7B	Redeemable noncontrolling interests	December 2022
TEP7D	Noncontrolling interests	December 2022
TEP7E	Redeemable noncontrolling interests	May 2023
TEP7G	Redeemable noncontrolling interests	August 2023
TEP7F	Redeemable noncontrolling interests	September 2023
Sunnova TEP 8-A, LLC ("TEP8A")	Noncontrolling interests	December 2023
Sunnova TEP 8-B, LLC ("TEP8B")	Noncontrolling interests	December 2023
TEP8C	Redeemable noncontrolling interests	December 2023

The purpose of the tax equity entities is to own and operate a portfolio of solar energy systems and energy storage systems. The terms of the tax equity entities' operating agreements contain allocations of taxable income (loss), Section 48(a) ITCs and cash distributions that vary over time and adjust between the members on an agreed date (referred to as the flip date). The operating agreements specify either a date certain flip date or an internal rate of return ("IRR") flip date. The date certain flip date is based on the passage of a fixed period of time that generally corresponds to the expiration of the recapture period associated with Section 48(a) ITCs or a year thereafter. The IRR flip date is the date on which the tax equity investor has achieved a contractual rate of return. From inception through the flip date, the Class A members' allocation of taxable income (loss) and Section 48(a) ITCs is generally 99% and the Class B members' allocation of taxable income (loss) and Section 48(a) ITCs is generally 1%. TEPIVA, TEPIVB, TEPIVC, TEPIVD, TEPIVE, TEPIVG, TEPVB, TEPVC, TEPVD, TEP6A, TEP6B, TEP6C, TEP6D, TEP7A, TEP7D and TEP8A also have a step-down period prior to the flip date during which the Class A members' allocation of certain items within taxable income (loss) become 67% and the Class B members' allocation of certain items within taxable income (loss) become 33% and TEPIVG, TEPVB, TEPVC and TEP6B also have an additional step-down period prior to the flip date during which the Class A members' allocation of certain items within taxable income (loss) are further reduced and the Class B members' allocation of certain items within taxable income (loss) are further increased. After the related flip date (or, if the tax equity investor has a deficit capital account, typically after such deficit has been eliminated), the Class A members' allocation of taxable income (loss) will typically decrease to 5% (or, in some cases, a higher percentage if required by the tax equity investor) and the Class B members' allocation of taxable income (loss) will increase by an inverse amount.

The redeemable noncontrolling interests and noncontrolling interests are comprised of Class A units, which represent the tax equity investors' interest in the tax equity entities. Both the Class A members and Class B members have call options to allow either member to redeem the other member's interest in the tax equity entities upon the occurrence of certain contingent events, such as bankruptcy, dissolution/liquidation and forced divestitures of the tax equity entities. Additionally, except for TEPIVG, TEPVB and TEP6B, the Class B members have the option to purchase all Class A units, which is typically exercisable at any time during the periods specified under each respective governing document, and, in regard to the tax equity entities classified as redeemable noncontrolling interests, also have the contingent obligation to purchase all Class A units if the Class A members exercise their right to withdraw, which is typically exercisable at any time during the periods specified under each respective governing document. In June 2023, we exercised our purchase option to purchase 100% of the Class A member's interest in Sunnova TEP I, LLC ("TEPI") for $5.9 million. This purchase resulted in an increase in our equity in TEPI of $67.0 million. The carrying values of the redeemable noncontrolling interests were equal to or greater than the estimated redemption values as of December 31, 2023 and 2022.

Guarantees. We are contractually obligated to make certain Class A members whole for losses they may suffer in certain limited circumstances resulting from the disallowance or recapture of Section 48(a) ITCs. We have concluded the likelihood of a significant recapture event is remote and consequently have not recorded a liability for any potential recapture exposure. The maximum potential future payments we could be required to make under this obligation would depend on the IRS successfully asserting upon audit the fair market values of the solar energy systems sold or transferred to the tax equity entities as determined by us exceed the allowable basis for the systems for purposes of claiming Section 48(a) ITCs. The fair market values of the solar energy systems and related Section 48(a) ITCs are determined, and the Section 48(a) ITCs are allocated to the Class A members, in accordance with the tax equity entities' operating agreements. Due to uncertainties associated with estimating the timing and amounts of distributions, the likelihood of an event that may trigger repayment, forfeiture or recapture of Section 48(a) ITCs to such Class A members, and the fact that we cannot determine how the IRS will evaluate system values used in claiming Section 48(a) ITCs, we cannot determine the potential maximum future payments that are required under these guarantees.

From time to time, we incur non-performance fees, which may include, but is not limited to, delays in the installation process and interconnection to the power grid of solar energy systems and other factors. The non-performance fees are settled by either a return of a portion of the Class A members' capital contributions or an additional payment to the Class A members. During the years ended December 31, 2023, 2022 and 2021, we paid $766,000, $9.5 million and $41.2 million, respectively, related to non-performance fees. As of December 31, 2023 and 2022, we recorded a liability of $3.2 million and $170,000, respectively, related to non-performance fees.

(14) Stockholders' Equity

In April 2021, we issued 3,095,329 shares of common stock in connection with the Acquisition. In August 2021, we issued an additional 27,526 shares of common stock in connection with the purchase price adjustments of the Acquisition. See Note 12, Acquisitions. In November 2021, we issued 1,027,409 shares of common stock in connection with our investments in solar receivables. See Note 8, Investments in Solar Receivables. During the year ended December 31, 2021, the remaining holders of our 9.75% convertible senior notes converted approximately $97.1 million aggregate principal amount, including accrued and unpaid interest to the date of each conversion, of our 9.75% convertible senior notes into 7,196,035 shares of our common stock.

In August 2023, we sold 5,865,000 shares of common stock at a public offering price of $14.75 per share. We received aggregate net proceeds of approximately $82.2 million, after deducting underwriting discounts and commissions of approximately $3.9 million and offering expenses of approximately $400,000. We used the net proceeds from the offering for general corporate purposes.

During the years ended December 31, 2023 and 2022, we issued 693,443 and 694,446 shares of our common stock to Len^{x}, LLC pursuant to the terms of the earnout agreement, as amended, entered into in connection with the acquisition of SunStreet.

(15) Equity-Based Compensation

Effective December 2013 and January 2015, we established and adopted two stock option plans (collectively, the "Prior Plans") after approval by our Board. The Prior Plans provided the aggregate number of shares of common stock that may be issued pursuant to stock options shall not exceed 26,032 shares. No further awards may be made under the Prior Plans.

Effective March 2016, we established and adopted a new stock option plan (the "2016 Plan") after approval by our Board. The 2016 Plan allowed for the issuance of non-qualified and incentive stock options. The 2016 Plan provided the aggregate number of shares of common stock that may be issued pursuant to stock options shall not exceed 4,288,950 shares. No further awards may be made under the 2016 Plan.

In connection with our IPO, our Board adopted the 2019 Long-Term Incentive Plan (the "LTIP") to incentivize employees, officers, directors and other service providers of SEI and its affiliates. The LTIP provides for the grant, from time to time, at the discretion of our Board or a committee thereof, of stock options, stock appreciation rights, stock awards, including restricted stock and restricted stock units, performance awards and cash awards. The LTIP provides the aggregate number of shares of common stock that may be issued pursuant to awards shall not exceed 5,229,318 shares. The number of shares available for issuance under the LTIP will be increased each fiscal year beginning in 2020, in an amount equal to the lesser of (a) a number of shares such that the total number of shares that remain available for additional grants under the LTIP equals five percent of the outstanding shares of our common stock on the last day of the immediately preceding fiscal year or (b) such number of shares determined by our Board. In February 2023, the aggregate number of shares of common stock that may be issued pursuant to awards under the LTIP was increased by 1,525,652, an amount that, together with the shares remaining available for grant under the LTIP, is equal to 5,746,588 shares, or approximately 5% of the number of shares of common stock outstanding as of December 31, 2022. Awards granted under the LTIP contain a service condition and cease vesting for employees, consultants and directors upon termination of employment or service. The grant date fair value of awards granted under the LTIP will be recognized ratably over the applicable vesting period of each award (either one year, three years or seven years).

The Prior Plans and the 2016 Plan will only allow for settlement of stock options by the issuance of common stock and awards issued under the LTIP can generally only be settled by the issuance of common stock. Therefore, we classify the awards as equity awards. We recognize the fair value of equity-based compensation awards as compensation cost in the financial statements, beginning on the grant date. We base compensation expense on the fair value of the awards we expect to vest, recognized over the service period, and adjusted for actual forfeitures that occur before vesting.

Stock Options

During 2021, 75,031 stock options were granted and 569,740 stock options were exercised resulting in the issuance of 569,740 shares of common stock in exchange for $9.0 million. During 2022, 538,758 stock options were granted and 18,383 stock options were exercised resulting in the issuance of 18,383 shares of common stock in exchange for $213,000. During 2023, 1,017,493 stock options were granted and 41,788 stock options were exercised resulting in the issuance of 41,788 shares of common stock in exchange for $540,000.

We used the following assumptions to apply the Black-Scholes option-pricing model to stock options granted during the years ended December 31, 2023, 2022 and 2021:

	Year Ended December 31,		
	2023	2022	2021
Expected dividend yield	0.00%	0.00%	0.00%
Risk-free interest rate	3.50% - 4.38%	2.40%	1.13%
Expected term (in years)	6.26 - 6.57	6.375 - 6.46	6.13
Volatility	65.58% - 69.81%	58.76%	55.13%

The expected volatility was calculated based on the average historical volatilities of publicly traded peer companies determined by us. The risk-free interest rate used was based on the U.S. treasury yield curve in effect at the time of grant for the expected term of the stock options to be valued. The expected dividend yield is zero as we do not anticipate paying common stock dividends within the relevant time frame. The expected term has been estimated using the average of the contractual term and weighted average life of the stock options. The following table summarizes stock option activity:

	Number of Stock Options	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (Years)	Weighted Average Grant Date Fair Value	Aggregate Intrinsic Value
					(in thousands)
Outstanding, December 31, 2021	2,765,815	$ 16.71	4.91		$ 31,874
Granted	538,758	$ 27.62	9.22	$ 14.37	
Exercised	(18,383)	$ 11.59			$ 231
Forfeited	(26,731)	$ 24.77		$ 12.83	
Outstanding, December 31, 2022	3,259,459	$ 18.48	4.75		$ 10,341
Granted	1,017,493	$ 15.01	9.23	$ 8.82	
Exercised	(41,788)	$ 12.91			$ 203
Forfeited	(217,015)	$ 19.38		$ 8.77	
Outstanding, December 31, 2023	4,018,149	$ 17.61	4.97		$ 5,542
Exercisable, December 31, 2023	2,575,095	$ 16.50	2.80		$ 4,787
Vested and expected to vest, December 31, 2023	4,018,149	$ 17.61	4.97		$ 5,542
Non-vested, December 31, 2022	570,230			$ 14.71	
Non-vested, December 31, 2023	1,443,054			$ 10.78	

The number of stock options that vested during the years ended December 31, 2023 and 2022 was 16,816. The grant date fair value of stock options that vested during the years ended December 31, 2023 and 2022 was $309,000. As of December 31, 2023, there was $9.1 million of total unrecognized compensation expense related to stock options, which is expected to be recognized over the remaining weighted average period of 1.79 years.

Restricted Stock Units

The following table summarizes restricted stock unit activity:

	Number of Restricted Stock Units	Weighted Average Grant Date Fair Value
Outstanding, December 31, 2021	1,649,789	$ 18.48
Granted	1,035,714	$ 23.79
Vested	(974,972)	$ 19.79
Forfeited	(100,916)	$ 26.21
Outstanding, December 31, 2022	1,609,615	$ 20.62
Granted	2,155,890	$ 14.50
Vested	(1,009,102)	$ 18.10
Forfeited	(372,198)	$ 17.78
Outstanding, December 31, 2023	2,384,205	$ 16.60

The grant date fair value of restricted stock units that vested during the years ended December 31, 2023 and 2022 was $18.3 million and $19.3 million, respectively. As of December 31, 2023, there was $26.6 million of total unrecognized compensation expense related to restricted stock units, which is expected to be recognized over the remaining weighted average period of 1.30 years.

Employee Stock Purchase Plan ("ESPP")

Effective May 2022, we established an ESPP. We are authorized to issue up to an aggregate 750,000 shares of common stock under the ESPP. The ESPP allows eligible employees to purchase shares of our common stock at a price per share equal to 95% of the lesser of the closing price of our common stock on the grant date or the purchase date. Payment for shares of our common stock is made as of the purchase date through payroll deductions on an after-tax basis over the designated purchase period. Each purchase period will generally be a six-month period commencing on January 1 and July 1 of each year, or such other period as the plan administrator may prescribe. The applicable purchase date is the last trading day of the purchase period or other such trading date designated by the plan administrator. An employee's payroll deductions under the ESPP are limited to 15% of the employee's eligible compensation with an annual limitation of $25,000. As of December 31, 2023 and 2022, the number of shares of common stock issued under the ESPP was 35,160 and 7,106, respectively.

(16) Basic and Diluted Net Loss Per Share

The following table sets forth the computation of our basic and diluted net loss per share:

	Year Ended December 31,		
	2023	2022	2021
	(in thousands, except share and per share amounts)		
Net loss attributable to stockholders—basic and diluted	$ (417,961)	$ (161,642)	$ (138,128)
Net loss per share attributable to stockholders—basic and diluted	$ (3.53)	$ (1.41)	$ (1.25)
Weighted average common shares outstanding—basic and diluted	118,344,728	114,451,034	110,881,630

The following table presents the weighted average shares of common stock equivalents that were excluded from the computation of diluted net loss per share for the periods presented because including them would have been anti-dilutive:

	Year Ended December 31,		
	2023	2022	2021
Equity-based compensation awards	6,093,155	4,907,458	4,670,740
Convertible senior notes	34,150,407	23,228,952	10,829,353

(17) Commitments and Contingencies

Legal. We are a party to a number of lawsuits, claims and governmental proceedings that are ordinary, routine matters incidental to our business. In addition, in the ordinary course of business, we periodically have disputes with dealers and customers. We do not expect the outcomes of these matters to have, either individually or in the aggregate, a material adverse effect on our financial position or results of operations.

Performance Guarantee Obligations. As of December 31, 2023, we recorded $6.8 million related to our guarantee of certain specified minimum solar energy production output under our leases and loans, of which $2.7 million is recorded in other current liabilities and $4.1 million is recorded in other long-term liabilities in the consolidated balance sheet. As of December 31, 2022, we recorded $4.8 million related to these guarantees, of which $2.5 million is recorded in other current liabilities and

$2.3 million is recorded in other long-term liabilities in the consolidated balance sheet. The changes in our aggregate performance guarantee obligations are as follows:

	Year Ended December 31, 2023	Year Ended December 31, 2022
	(in thousands)	
Balance at beginning of period	$ 4,845	$ 5,293
Accruals	4,982	2,727
Settlements	(3,074)	(3,175)
Balance at end of period	$ 6,753	$ 4,845

Operating and Finance Leases. We lease real estate and certain office equipment under operating leases and vehicles and certain other office equipment under finance leases. The following table presents the detail of lease expense as recorded in general and administrative expense in the consolidated statements of operations:

	Year Ended December 31, 2023	2022	2021
		(in thousands)	
Operating lease expense	$ 2,910	$ 2,753	$ 1,643
Finance lease expense:			
Amortization expense	1,150	783	417
Interest on lease liabilities	109	60	38
Short-term lease expense	197	141	78
Variable lease expense	1,049	961	1,064
Total	$ 5,415	$ 4,698	$ 3,240

The following table presents the detail of right-of-use assets and lease liabilities as recorded in other assets and other current liabilities/other long-term liabilities, respectively, in the consolidated balance sheets:

	As of December 31, 2023	2022
	(in thousands)	
Right-of-use assets:		
Operating leases	$ 13,247	$ 14,706
Finance leases	4,085	2,476
Total right-of-use assets	$ 17,332	$ 17,182
Current lease liabilities:		
Operating leases	$ 2,883	$ 2,451
Finance leases	1,348	796
Long-term leases liabilities:		
Operating leases	14,005	15,751
Finance leases	1,631	957
Total lease liabilities	$ 19,867	$ 19,955

Other information related to leases was as follows:

	Year Ended December 31,		
	2023	2022	2021
		(in thousands)	
Cash paid for amounts included in the measurement of lease liabilities:			
Operating cash flows from operating leases (1)	$ 2,765	$ 1,647	$ 1,310
Operating cash flows from finance leases	$ 109	$ 60	$ 38
Financing cash flows from finance leases	$ 1,059	$ 801	$ 476
Right-of-use assets obtained in exchange for lease obligations:			
Operating leases	$ 741	$ 245	$ 8,867
Finance leases	$ 2,759	$ 1,072	$ 2,213

(1) Includes reimbursements in 2023, 2022 and 2021 of approximately $545,000, $297,000 and $423,000, respectively, for leasehold improvements.

	As of December 31,	
	2023	2022
Weighted average remaining lease term (years):		
Operating leases	5.51	6.60
Finance leases	3.12	2.86
Weighted average discount rate:		
Operating leases	4.06%	3.95%
Finance leases	6.26%	4.37%

Future minimum lease payments under our non-cancelable leases as of December 31, 2023 were as follows:

	Operating Leases	Finance Leases
	(in thousands)	
2024	$ 3,517	$ 1,498
2025	3,409	940
2026	3,236	541
2027	3,304	277
2028	3,372	—
2029 and thereafter	2,113	—
Total	18,951	3,256
Amount representing interest	(1,987)	(277)
Amount representing leasehold incentives	(76)	—
Present value of future payments	16,888	2,979
Current portion of lease liability	(2,883)	(1,348)
Long-term portion of lease liability	$ 14,005	$ 1,631

Letters of Credit. In connection with a reinsurance agreement and various security arrangements for an office lease, we have letters of credit outstanding of $0 and $4.1 million as of December 31, 2023 and 2022, respectively. The letters of credit are cash collateralized for the same amount or a lesser amount and this cash is classified as restricted cash recorded in other current assets and other assets in the consolidated balance sheets.

Guarantees or Indemnifications. We enter into contracts that include indemnifications and guarantee provisions. In general, we enter into contracts with indemnities for matters such as breaches of representations and warranties and covenants contained in the contract and/or against certain specified liabilities. Examples of these contracts include dealer agreements, debt agreements, asset purchases and sales agreements, service agreements and procurement agreements. We are unable to estimate our maximum potential exposure under these agreements until an event triggering payment occurs.

Dealer Commitments. As of December 31, 2023 and 2022, the net unamortized balance of payments to dealers for exclusivity and other similar arrangements was $166.4 million and $121.3 million, respectively. Under these agreements, we paid $53.8 million and $50.1 million during the years ended December 31, 2023 and 2022, respectively. We could be obligated to make maximum payments, excluding additional amounts payable on a per watt basis if even higher thresholds are met, as follows:

	Dealer Commitments
	(in thousands)
2024	$ 77,724
2025	57,079
2026	36,904
2027	30,000
2028	—
2029 and thereafter	—
Total	$ 201,707

Purchase Commitments. In December 2021, we amended an agreement with a supplier in which we agreed to purchase at least 1,420 megawatt hours of solar energy systems, energy storage systems and accessories through December 2023. In October 2023, we further amended this agreement in which we agreed to purchase approximately $325.0 million of energy storage systems through December 2024. Under this agreement, we purchased $178.6 million and $216.0 million during the years ended December 31, 2023 and 2022, respectively. As of December 31, 2023, we estimate our remaining purchase commitment to be approximately $255.0 million.

Information Technology Commitments. We have certain long-term contractual commitments related to information technology software services and licenses. Future commitments as of December 31, 2023 were as follows:

	Information Technology Commitments
	(in thousands)
2024	$ 23,045
2025	7,243
2026	6,137
2027	7,405
2028	515
2029 and thereafter	515
Total	$ 44,860

(18) Subsequent Events

EZOP Debt. In February 2024, we amended the EZOP revolving credit facility to, among other things, (a) reflect certain assignments of commitments occurring within the Atlas Lender Group (as defined by such revolving credit facility) without increasing the existing commitments, and the assignment of the role of the Atlas funding agent for the Atlas Lender Group, (b) amend the thresholds for certain "Amortization Events" (as defined by such revolving credit facility) and (c) modify the "Liquidity Reserve Account Required Balance" (as defined by such revolving credit facility).

TEPH Debt. In February 2024, we amended the TEPH revolving credit facility to, among other things, reflect an assignment of commitments occurring within the Atlas Lender Group (as defined by such revolving credit facility) without increasing the existing commitments and the appointment of a new Atlas funding agent for the Atlas Lender Group.

SOLVI Debt. In February 2024, we pooled and transferred eligible solar energy systems and the related asset receivables into wholly-owned subsidiaries of SOLVI, a special purpose entity, that issued $194.5 million in aggregate principal amount of Series 2024-1 Class A solar asset-backed notes, $16.5 million in aggregate principal amount of Series 2024-1 Class B solar asset-backed notes and $15.0 million in aggregate principal amount of Series 2024-1 Class C solar asset-backed notes (collectively, the "SOLVI Notes") with a maturity date of January 2059. The SOLVI Notes were issued at a discount of 4.66%, 7.08% and 13.98% for the Class A, Class B and Class C notes, respectively, and bear interest at an annual rate equal to 5.65%, 7.00% and 9.00% for the Class A, Class B and Class C notes, respectively. The cash flows generated by the solar energy systems of SOLVI's subsidiaries are used to service the quarterly principal and interest payments on the SOLVI Notes and satisfy SOLVI's expenses, and any remaining cash can be distributed to Sunnova SOL VI Depositor, LLC, SOLVI's sole member. In connection with the SOLVI Notes, certain of our affiliates receive a fee for managing and servicing the solar energy systems pursuant to a transaction management agreement and management and servicing agreements. In addition, Sunnova Energy Corporation has guaranteed (a) the obligations of certain of our subsidiaries to manage and service the solar energy systems pursuant to a transaction management agreement and management and servicing agreements, (b) the managing members' obligations, in such capacity, under the related financing fund's limited liability company agreement and (c) certain of our subsidiaries' obligations to repurchase or substitute certain ineligible solar energy systems eventually sold to SOLVI pursuant to the sale and contribution agreement. SOLVI is also required to maintain certain reserve accounts for the benefit of the holders of the SOLVI Notes, each of which must remain funded at all times to the levels specified in the SOLVI Notes. The indenture requires SOLVI to track the debt service coverage ratio (such ratio, the "DSCR") of (a) the amount of certain payments received from customers, certain performance based incentives, certain energy credits and any applicable insurance proceeds as of a specific date to (b) interest and scheduled principal due on the SOLVI Notes as of such date, with the potential to enter into an early amortization period if the DSCR drops below a certain threshold. The holders of the SOLVI Notes have no recourse to our other assets except as expressly set forth in the SOLVI Notes.

Redeemable Noncontrolling Interests and Noncontrolling Interests. In February 2024, the Class A member of TEP7A increased its capital commitment from approximately $59.0 million to approximately $61.4 million. In February 2024, we admitted a tax equity investor as the Class A member of Sunnova TEP 8-D, LLC ("TEP8D"), a subsidiary of Sunnova TEP 8-D Manager, LLC, which is the Class B member of TEP8D. The Class A member of TEP8D made a total capital commitment of approximately $195.0 million.

SCHEDULE I PARENT COMPANY CONDENSED FINANCIAL STATEMENTS

SUNNOVA ENERGY INTERNATIONAL INC.
CONDENSED BALANCE SHEETS
(in thousands, except share amounts and share par values)

	As of December 31,	
	2023	**2022**
Assets		
Current assets:		
Cash	$ 75	$ 65
Accounts receivable, including affiliates	7	—
Total current assets	82	65
Investments in subsidiaries	1,677,268	2,056,622
Total assets	$ 1,677,350	$ 2,056,687
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	$ 2	$ 22
Other current liabilities	6,138	5,895
Total current liabilities	6,140	5,917
Long-term debt, net	1,155,078	1,149,756
Total liabilities	1,161,218	1,155,673
Stockholders' equity:		
Common stock, 122,466,515 and 114,939,079 shares issued as of December 31, 2023 and 2022, respectively, at $0.0001 par value	12	11
Additional paid-in capital—common stock	1,735,470	1,617,856
Accumulated deficit	(1,219,350)	(716,853)
Total stockholders' equity	516,132	901,014
Total liabilities and stockholders' equity	$ 1,677,350	$ 2,056,687

See accompanying notes to parent company condensed financial statements.

SCHEDULE I PARENT COMPANY CONDENSED FINANCIAL STATEMENTS

SUNNOVA ENERGY INTERNATIONAL INC.
CONDENSED STATEMENTS OF OPERATIONS
(in thousands)

	Year Ended December 31,		
	2023	2022	2021
Revenue	$ —	$ —	$ —
General and administrative expense	1,367	1,362	929
Other operating expense	24	—	—
Operating loss	(1,391)	(1,362)	(929)
Interest expense, net	22,536	10,835	3,722
Equity in losses of subsidiaries	478,494	118,079	142,870
Loss before income tax	(502,421)	(130,276)	(147,521)
Income tax expense	5	—	—
Net loss	$ (502,426)	$ (130,276)	$ (147,521)

See accompanying notes to parent company condensed financial statements.

SCHEDULE I PARENT COMPANY CONDENSED FINANCIAL STATEMENTS

SUNNOVA ENERGY INTERNATIONAL INC.
CONDENSED STATEMENTS OF CASH FLOWS
(in thousands)

	Year Ended December 31,		
	2023	2022	2021
CASH FLOWS FROM OPERATING ACTIVITIES			
Net cash provided by (used in) operating activities	$ (13,605)	$ 3,045	$ 8,554
CASH FLOWS FROM INVESTING ACTIVITIES			
Investments in subsidiaries	(88,645)	(560,700)	(500,700)
Distributions from subsidiaries	19,650	21,100	—
Other, net	90	—	—
Net cash used in investing activities	(68,905)	(539,600)	(500,700)
CASH FLOWS FROM FINANCING ACTIVITIES			
Proceeds from long-term debt	—	585,000	560,625
Payments of deferred financing costs	(43)	(516)	(615)
Purchase of capped call transactions	—	(48,420)	(91,655)
Proceeds from issuance of common stock, net	82,563	38	19,392
Net cash provided by financing activities	82,520	536,102	487,747
Net increase (decrease) in cash	10	(453)	(4,399)
Cash at beginning of period	65	518	4,917
Cash at end of period	$ 75	$ 65	$ 518
Non-cash investing and financing activities:			
Non-cash conversion of convertible senior notes for common stock	$ —	$ —	$ 95,648
Non-cash issuance of common stock for investments in solar receivables	$ —	$ —	$ 44,353
Non-cash issuance of common stock for business acquisition	$ —	$ —	$ 128,224
Supplemental cash flow information:			
Cash paid for interest	$ 17,013	$ 1,438	$ 1,390
Cash paid for income taxes	$ —	$ —	$ —

See accompanying notes to parent company condensed financial statements.

SCHEDULE I NOTES TO PARENT COMPANY CONDENSED FINANCIAL STATEMENTS

(1) Basis of Presentation

On July 24, 2019, Sunnova Energy International Inc. ("SEI") priced 14,000,000 shares of its common stock at a public offering price of $12.00 per share and on July 25, 2019, SEI's common stock began trading on the New York Stock Exchange under the symbol "NOVA". Upon the closing of our initial public offering on July 29, 2019 (our "IPO"), Sunnova Energy Corporation was contributed to SEI and SEI became the holding company of Sunnova Energy Corporation through a reverse merger. In addition, the historical financial statements of Sunnova Energy Corporation became the historical financial statements of SEI. These condensed financial statements include the condensed balance sheets, condensed statements of operations and condensed statements of cash flows and have been prepared on a parent-only basis. These parent-only financial statements do not include all of the information and notes required by accounting principles generally accepted in the United States of America for annual financial statements and therefore, these parent-only financial statements and other information included should be read in conjunction with SEI's consolidated financial statements and related notes contained within this Annual Report on Form 10-K.

(2) Guarantees

See Note 9, Long-Term Debt.

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

None.

Item 9A. Controls and Procedures.

Internal Control Over Financial Reporting

Evaluation of Disclosure Controls and Procedures

We carried out an evaluation, under the supervision and with the participation of our management, including our Chief Executive Officer ("CEO") and our Chief Financial Officer ("CFO"), of the effectiveness of our disclosure controls and procedures as of the end of the period covered by this Annual Report on Form 10-K, pursuant to Rules 13a-15(e) and 15d-15(e) under the Exchange Act. In connection with that evaluation, our CEO and our CFO concluded our disclosure controls and procedures were effective and designed to provide reasonable assurance the information required to be disclosed is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms as of December 31, 2023, and that such information is accumulated and communicated to our management, including our CEO and CFO, as appropriate to allow timely decisions regarding required disclosures. The term "disclosure controls and procedures", as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, means controls and other procedures of a company that are designed to ensure information required to be disclosed by a company in the reports it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure information required to be disclosed by a company in the reports it files or submits under the Exchange Act is accumulated and communicated to the company's management, including its principal executive and principal financial officers, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure. Management recognizes any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures.

Changes in Internal Control over Financial Reporting

There was no change in our internal control over financial reporting that occurred during the fourth quarter of 2023 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Limitations on Effectiveness of Controls and Procedures

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

Management's Report on Internal Control over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting (as defined by Rule 13a-15(f) under the Exchange Act). Management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission to evaluate the effectiveness of our internal control over financial reporting. Management has assessed the effectiveness of our internal control over financial reporting as of December 31, 2023 and has concluded that such internal control over financial reporting is effective.

The effectiveness of our internal control over financial reporting as of December 31, 2023 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in its report, which is included in Item 8 of this Annual Report on Form 10-K.

Item 9B. Other Information.

10b5-1 Plans

Sell to Cover 10b5-1 Trading Arrangements

During the three months ended December 31, 2023, the following directors and officers adopted certain trading plans ("10b5-1 Plans") intended to satisfy the affirmative defense conditions of Rule 10b5-1(c) under the Exchange Act. The 10b5-1 Plans authorize an agent to sell such securities as are necessary to satisfy tax withholding obligations, commissions and any fees, arising exclusively from the vesting of certain previously granted compensatory awards of restricted stock units, outlined as follows:

Name	Title	Shares Vesting and Subject to Sell-to-Cover	Date Adopted	Plan Start Date	Plan End Date
Michael Grasso	Executive Vice President, Chief Revenue Officer	13,980	November 14, 2023	March 25, 2024	April 25, 2024
Chris Hayden	Executive Vice President, Chief Technology Officer	3,333	November 9, 2023	March 25, 2024	April 25, 2024
Kris Hillstrand	Executive Vice President, Direct	13,980	November 15, 2023	March 25, 2024	April 25, 2024
Kelsey Hultberg	Executive Vice President, Corporate Communications and Sustainability	3,181	November 22, 2023	March 25, 2024	April 25, 2024
Robert Lane	Executive Vice President and Chief Financial Officer	16,874	November 2, 2023	March 25, 2024	December 31, 2024
Meghan Nutting	Executive Vice President, Government and Regulatory Affairs	6,464	November 16, 2023	March 25, 2024	April 25, 2024

Chris Hayden, Executive Vice President, Chief Technology Officer

On December 13, 2023, Chris Hayden, Executive Vice President, Chief Technology Officer, terminated a 10b5-1 Plan intended to satisfy the affirmative defense conditions of Rule 10b5-1(c) under the Exchange Act. Such 10b5-1 Plan was adopted on November 9, 2023 and provided for the exercise and sale of up to 5,715 employee stock options at various prices dependent on the market price of the shares of our common stock, commencing on April 2, 2024 and continuing through April 2, 2025.

Robert Lane, Executive Vice President and Chief Financial Officer

On November 2, 2023, Robert Lane, Executive Vice President and Chief Financial Officer, adopted a 10b5-1 Plan intended to satisfy the affirmative defense conditions of Rule 10b5-1(c) under the Exchange Act for the sale of up to 17,230 shares of our common stock at various prices dependent on the market price of the shares of our common stock, commencing on March 25, 2024 and continuing through December 31, 2024.

Jackson Lynch, Executive Vice President and Chief Human Resources Officer

On December 5, 2023, Jackson Lynch, Executive Vice President and Chief Human Resources Officer, adopted a 10b5-1 Plan intended to satisfy the affirmative defense conditions of Rule 10b5-1(c) under the Exchange Act for the sale of an indeterminate number of shares of our common stock dependent on the market price of the shares of our common stock issued in connection with restricted stock awards he will receive as annual incentive plan compensation that vest on issuance, commencing on March 6, 2024 and continuing through June 28, 2024.

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections.

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

The information required by this Item 10 of Form 10-K will be set forth in our proxy statement to be filed with the SEC in connection with the solicitation of proxies for our 2023 Annual Meeting of Stockholders ("Proxy Statement") or an amendment to this Form 10-K and is incorporated herein by reference. The Proxy Statement will be filed with the SEC within 120 days after the year-end of the fiscal year that this report relates.

Item 11. Executive Compensation.

The information required by this Item 11 will be set forth in the Proxy Statement or an amendment to this Form 10-K and is incorporated herein by reference.

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

The information required by this Item 12 will be set forth in the Proxy Statement or an amendment to this Form 10-K and is incorporated herein by reference.

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

The information required by this Item 13 will be set forth in the Proxy Statement or an amendment to this Form 10-K and is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services.

Our independent registered public accounting firm is PricewaterhouseCoopers LLP, Houston, TX, auditor firm ID: 238. The information required by this Item 14 will be set forth in the Proxy Statement or an amendment to this Form 10-K and is incorporated herein by reference.

PART IV

Item 15. Exhibits and Financial Statement Schedules.

Documents filed as part of this report are as follows:

(1) Consolidated Financial Statements

Our consolidated financial statements are listed in the "Index to Consolidated Financial Statements" under Item 8 of Part II of this Annual Report.

(2) Financial Statement Schedules

The required information is included elsewhere in the Annual Report, not applicable or not material.

(3) Exhibits

The exhibits listed in the accompanying "Exhibit Index" are filed or incorporated by reference as part of this Annual Report.

Exhibit Index

Exhibit No.	Description
2.1	Merger Agreement, dated as of July 29, 2019, by and among Sunnova Energy International Inc., Sunnova Energy Corporation and Sunnova Merger Sub Inc. (incorporated by reference to Exhibit 2.1 to Form 8-K filed on July 29, 2019).
2.2	Merger Agreement, by and among Sunnova Energy International Inc., Moonroad LLC, Sunnova Energy Corporation, SunStreet Energy Group, LLC and LEN X, LLC, dated as of February 17, 2021 (incorporated by reference to Exhibit 2.1 to Form 8-K filed on February 19, 2021).
3.1	Second Amended and Restated Certificate of Incorporation of Sunnova Energy International Inc. (incorporated by reference to Exhibit 3.3 to Form 8-K filed on July 29, 2019).
3.2	Third Amended and Restated Bylaws of Sunnova Energy International Inc. (incorporated by reference to Exhibit 3.2 to Form 10-Q filed on October 26, 2023).
4.1	Description of Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934 (incorporated by reference to Exhibit 4.1 from Form 10-K filed on February 25, 2021).
4.2	Stockholders Agreement, dated July 29, 2019, by and among Sunnova Energy International Inc. and certain holders of its capital stock (incorporated by reference to Exhibit 4.1 to Form 8-K filed on July 29, 2019).
4.3	Stockholders Agreement, by and among Sunnova Energy International Inc., Lennar Corporation and LEN X, LLC, dated as of April 1, 2021 (incorporated by reference to Exhibit 4.1 to Form 8-K filed on April 1, 2021).
4.4	Second Amended and Restated Registration Rights Agreement, dated July 29, 2019, by and among Sunnova Energy International Inc. and certain stockholders party thereto (incorporated by reference to Exhibit 4.2 to Form 8-K filed on July 29, 2019).
4.4.1	First Amendment to The Second Amended and Restated Registration Rights Agreement, among Sunnova Energy International Inc. and the parties listed therein, dated May 14, 2020 (incorporated by reference to Exhibit 4.2.1 to Form S-1 filed on June 29, 2020).
4.5	Registration Rights Agreement among Sunnova Energy International Inc. and the parties listed therein, dated May 14, 2020 (incorporated by reference to Exhibit 4.4 to form S-1 filed on June 29, 2020).
4.6∞	Indenture, among Sunnova Helios II Issuer, LLC and Wells Fargo Bank, National Association, dated November 8, 2018 (incorporated by reference to Exhibit 4.11 to Form S-1 filed on June 27, 2019).
4.7∞	Indenture, among Sunnova RAYS I Issuer, LLC and Wilmington Trust, National Association, dated March 28, 2019 (incorporated by reference to Exhibit 4.12 to Form S-1 filed on June 27, 2019).
4.7.1∞	Indenture Supplement No. 1, among Sunnova RAYS I Issuer, LLC and Wilmington Trust, National Association, dated March 28, 2019 (incorporated by reference to Exhibit 4.13 to Form S-1 filed on June 27, 2019).
4.7.2∞	Indenture Supplement No. 2, among Sunnova RAYS I Issuer, LLC and Wilmington Trust, National Association, dated June 7, 2019 (incorporated by reference to Exhibit 4.14 to Form S-1 filed on June 27, 2019).

Exhibit No.	Description
4.8∞	Indenture, among Sunnova Helios III Issuer, LLC and Wells Fargo Bank, National Association, dated June 27, 2019 (incorporated by reference to Exhibit 4.15 to Form S-1 filed on June 27, 2019).
4.9∞	Indenture, between Sunnova Sol Issuer, LLC and Wells Fargo Bank, National Association, as Indenture Trustee, dated February 12, 2020 (incorporated by reference to Exhibit 4.1 to Form 10-Q filed on May 15, 2020).
4.10∞	Indenture, between Sunnova Helios IV Issuer, LLC and Wells Fargo Bank, National Association, dated June 19, 2020 (incorporated by reference to Exhibit 4.12 to Form S-1 filed on June 29, 2020).
4.11∞	Indenture, between Sunnova Sol II Issuer, LLC and Wells Fargo Bank, National Association, as Indenture Trustee, dated November 30, 2020 (incorporated by reference to Exhibit 4.1 to Form 8-K filed on November 30, 2020).
4.12∞	Indenture, between Sunnova Helios V Issuer, LLC and Wells Fargo Bank, National Association, dated February 16, 2021 (incorporated by reference to Exhibit 4.13 to Form 10-K filed on February 25, 2021).
4.13	Indenture, dated May 20, 2021, between Sunnova Energy International Inc. and Wilmington Trust, National Association (incorporated by reference to Exhibit 4.1 to Form 8-K filed on May 21, 2021).
4.14∞	Indenture, between Sunnova Sol III Issuer, LLC and Wilmington Trust, National Association, dated June 17, 2021 (incorporated by reference to Exhibit 4.3 to Form 10-Q filed on July 29, 2021).
4.15	Indenture, dated July 27, 2021, among Sunnova Helios VI Issuer, LLC, and Wilmington Trust, National Association (incorporated by reference to Exhibit 4.1 to Form 10-Q filed on October 28, 2021).
4.16	Indenture, dated August 17, 2021, among Sunnova Energy Corporation, Sunnova Energy International Inc., Sunnova Intermediate Holdings, LLC and Wilmington Trust, National Association (incorporated by reference to Exhibit 4.1 to Form 8-K filed on August 17, 2021).
4.17	Indenture, dated October 26, 2021, between Sunnova Helios VII Issuer, LLC and Wilmington Trust National Association (incorporated by reference to Exhibit 4.16 to Form 10-K filed on February 24, 2022).
4.18∞	Indenture, dated February 24, 2022, among Sunnova Helios VIII Issuer, LLC and Wilmington Trust, National Association (incorporated by reference to Exhibit 4.1 to Form 10-Q filed on April 28, 2022).
4.19∞	Indenture, dated June 27, 2022, between Sunnova Sol IV Issuer, LLC and Wilmington Trust, National Association (incorporated by reference to Exhibit 4.1 to Form 10-Q filed on July 28, 2022).
4.20∞	Indenture, dated August 17, 2022, by and among Sunnova Helios IX Issuer, LLC and Wilmington Trust, National Association (incorporated by reference to Exhibit 4.1 to Form 10-Q filed on October 27, 2022).
4.21	Indenture, dated August 19, 2022, between Sunnova Energy International Inc. and Wilmington Trust, National Association (incorporated by reference to Exhibit 4.1 to Form 8-K filed on August 19, 2022).
4.22∞	Indenture, dated November 10, 2022, by and among Sunnova Helios X Issuer, LLC and Wilmington Trust, National Association (incorporated by reference to Exhibit 4.22 to Form 10-K filed on February 23, 2023).
4.23∞	Indenture, by and between Sunnova Sol V Issuer, LLC and Wilmington Trust, National Association, as indenture trustee, dated as of April 26, 2023 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on April 26, 2023).
4.24∞	Indenture, by and between Helios XI Issuer, LLC and Wilmington Trust, National Association, as indenture trustee, dated as of May 16, 2023 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on May 16, 2023).
4.25∞	Indenture, by and between Helios XII Issuer, LLC and Wilmington Trust, National Association, as indenture trustee, dated as of August 30, 2023 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on September 6, 2023).
4.26	Indenture, dated September 26, 2023, among Sunnova Energy Corporation, Sunnova Energy International Inc., Sunnova Intermediate Holdings, LLC and Wilmington Trust, National Association (incorporated by reference to Exhibit 4.1 to Form 8-K filed on September 26, 2023).
4.27∞	Indenture, by and between Sunnova SOL VI Issuer, LLC and Wilmington Trust, National Association, as indenture trustee, dated as of February 13, 2024 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on February 14, 2024).
10.1	Form of Capped Call Confirmation (incorporated by reference to Exhibit 10.2 to Form 8-K filed May 21, 2021).
10.2	Form of Additional Capped Call Confirmation (incorporated by reference to Exhibit 10.1 to Form 8-K filed May 24, 2021).

Exhibit No.	Description
10.3	Form of Capped Call Confirmation (incorporated by reference to Exhibit 10.2 to Form 8-K filed on August 19, 2022).
10.4	Earnout Agreement, by and between LEN X, LLC and Sunnova Energy International Inc., dated as of February 17, 2021 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on February 19, 2021).
10.4.1	Amendment to Earnout Agreement, dated as of June 22, 2023, by and among Lenx, LLC, and Sunnova Energy International Inc. (incorporated by reference to Exhibit 10.2 to Form 10-Q filed on July 27, 2023).
10.5∞	Amended and Restated Credit Agreement, among Sunnova EZ-Own Portfolio, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 7 Holdings, LLC, Credit Suisse AG, New York Branch, Wells Fargo Bank, National Association, U.S. Bank National Association, the Funding Agents from time to time party thereto, and the Lenders from time to time party thereto, dated March 27, 2019 (incorporated by reference to Exhibit 10.6 to Form S-1 filed on June 27, 2019).
10.5.1	Amendment No. 1 to Amended and Restated Credit Agreement, among Sunnova EZ-Own Portfolio, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 7 Holdings, LLC, Credit Suisse AG, New York Branch, Wells Fargo Bank, National Association, U.S. Bank National Association, the Funding Agents from time to time party thereto, and the Lender from time to time party thereto, dated June 5, 2019 (incorporated by reference to Exhibit 10.3.1 to Form S-1 filed on June 29, 2020).
10.5.2	Amendment No. 2 to Amended and Restated Credit Agreement, among Sunnova EZ-Own Portfolio, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 7 Holdings, LLC, Credit Suisse AG, New York Branch, Wells Fargo Bank, National Association, U.S. Bank National Association, the Funding Agents from time to time party thereto, and the Lenders from time to time party thereto, dated September 30, 2019 (incorporated by reference to Exhibit 10.18 to Form 10-Q filed on October 31, 2019).
10.5.3	Amendment No. 3 to the Amended and Restated Credit Agreement, among Sunnova EZ-Own Portfolio, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 7 Holdings, LLC, the Lenders party thereto, the Funding Agents party thereto and Credit Suisse AG, New York Branch, dated as of December 4, 2019 (incorporated by reference to Exhibit 10.4 to Form 10-K filed on February 25, 2020).
10.5.4	Amendment No. 4 to the Amended and Restated Credit Agreement, among Sunnova EZ-Own Portfolio, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 7 Holdings, LLC, the Lenders party thereto, the Funding Agents party thereto and Credit Suisse AG, New York Branch, dated as of January 29, 2020 (incorporated by reference to Exhibit 10.6 to Form 10-Q filed on May 15, 2020).
10.5.5	Amendment No. 5 to the Amended and Restated Credit Agreement, among Sunnova EZ-Own Portfolio, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 7 Holdings, LLC, the Lenders party thereto, the Funding Agents party thereto and Credit Suisse AG, New York Branch, dated as of March 31, 2020 (incorporated by reference to Exhibit 10.5 to Form 10-Q filed on May 15, 2020).
10.5.6	Amendment No. 6 to Amended and Restated Credit Agreement, among Sunnova EZ-Own Portfolio, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 7 Holdings, LLC, the Lenders party thereto, the Funding Agents party thereto and Credit Suisse AG, New York Branch, dated September 18, 2020 (incorporated by reference to Exhibit 10.1 to Form 10-Q filed on October 29, 2020).
10.5.7∞	Amendment No. 7 to the Amended and Restated Credit Agreement, among Sunnova EZ-Own Portfolio, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 7 Holdings, LLC, the Lenders party thereto, the Funding Agents party thereto and Credit Suisse AG, New York Branch, dated as of March 9, 2021 (incorporated by reference to Exhibit 10.1 to Form 10-Q filed on April 29, 2021).
10.5.8∞	Amendment No. 8 to the Amended and Restated Credit Agreement, among Sunnova EZ-Own Portfolio, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 7 Holdings, LLC, the Lenders party thereto, the Funding Agents party thereto and Credit Suisse AG, New York Branch, dated as of June 8, 2022 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on June 10, 2022).
10.5.9	Amendment No. 9 to the Amended and Restated Credit Agreement, among Sunnova EZ-Own Portfolio, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 7 Holdings, LLC, the Lenders party thereto, the Funding Agents party thereto and Credit Suisse AG, New York Branch, dated as of July 22, 2022 (incorporated by reference to Exhibit 10.4 to Form 10-Q filed on July 28, 2022).
10.5.10∞	Amendment No. 10 to the Amended and Restated Credit Agreement and Omnibus Amendment No. 2 (SLA), among Sunnova EZ-Own Portfolio, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 7 Holdings, LLC, the Lenders party thereto, the Funding Agents party thereto, Wells Fargo Bank, National Association and Credit Suisse AG, New York Branch, dated as of August 5, 2022 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on August 8, 2022).

Exhibit No.	Description
10.5.11∞	Amendment No. 11 to the Amended and Restated Credit Agreement and Omnibus Amendment No. 3 (SLA), among Sunnova EZ-Own Portfolio, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 7 Holdings, LLC, the Lenders party thereto, the Funding Agents party thereto, Wells Fargo Bank, National Association and Credit Suisse AG, New York Branch, dated as of September 28, 2022 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on September 30, 2022).
10.5.12∞	Amendment No. 12 to Amended and Restated Credit Agreement (SLA), among Sunnova EZ-Own Portfolio, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 7 Holdings, LLC, the lenders and other financial institutions party thereto and Credit Suisse AG, New York Branch, as agent, dated as of February 24, 2023 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on March 1, 2023).
10.5.13∞	Amendment No. 13 to Amended and Restated Credit Agreement (SLA), among Sunnova EZ-Own Portfolio, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 7 Holdings, LLC, the lenders and other financial institutions party thereto and Atlas Securitized Products Holdings, L.P., as agent, dated as of March 30, 2023 (incorporated by reference to Exhibit 10.2 to Form 8-K filed March 31, 2023).
10.5.14∞	Second Amended and Restated Credit Agreement, among Sunnova EZ-Own Portfolio, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 7 Holdings, LLC, the lenders and other financial institutions party thereto and Atlas Securitized Products Holdings, L.P., as administrative agent, dated as of August 2, 2023 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on August 7, 2023).
10.5.15∞	Amendment No. 1 to Second Amended and Restated Credit Agreement (SLA), among Sunnova EZ-Own Portfolio, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 7 Holdings, LLC, the lenders and other financial institutions party thereto and Atlas Securitized Products Holdings, L.P., as administrative agent, dated as of October 6, 2023.
10.5.16∞	Amendment No. 2 to Second Amended and Restated Credit Agreement (SLA), among Sunnova EZ-Own Portfolio, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 7 Holdings, LLC, the lenders and other financial institutions party thereto and Atlas Securitized Products Holdings, L.P., as administrative agent, dated as of February 14, 2024 (incorporated by reference to Exhibit 10.2 to Form 8-K filed on February 14, 2024).
10.6∞	Credit Agreement among Sunnova TEP Inventory, LLC, Credit Suisse AG, New York Branch, the Funding Agents from time to time party thereto, and the Lenders from time to time party thereto, dated December 30, 2019 (incorporated by reference to Exhibit 10.35 to Form 10-K filed on February 25, 2020).
10.6.1	Consent and Amendment, by and among Sunnova TEP Inventory, LLC, Credit Suisse AG, New York Branch, the Funding Agents from time to time party thereto, and the Lenders from time to time party thereto, Sunnova Inventory Pledgor, LLC, and Sunnova TEP Developer, LLC, dated November 30, 2020 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on November 30, 2020).
10.6.2∞	First Amendment to Credit Agreement and Security Agreements, by and among Sunnova TEP Inventory, LLC, Credit Suisse AG, New York Branch, the Lenders and Funding Agents party thereto, Sunnova Energy Corporation, Sunnova Inventory Pledgor, LLC and Sunnova TEP Developer, LLC, dated September 18, 2020 (incorporated by reference to Exhibit 10.2 to Form 10-Q filed on October 29, 2020).
10.6.3∞	Second Amendment to Credit Agreement, by and among Sunnova TEP Inventory, LLC, Credit Suisse AG, New York Branch, the Lenders and Funding Agents party thereto, Sunnova Energy Corporation, Sunnova Inventory Pledgor, LLC, Sunnova TEP OpCo, LLC and Sunnova TEP Developer, LLC, dated March 29, 2021 (incorporated by reference to Exhibit 10.7 to Form 10-Q filed on April 29, 2021).
10.7∞	Credit Agreement, by and among Sunnova Asset Portfolio 8, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 8 Holdings, LLC, the Lenders party thereto, the Funding Agents party thereto and Banco Popular de Puerto Rico, dated September 30, 2020 (incorporated by reference to Exhibit 10.4 to Form 10-Q filed on October 29, 2020).
10.7.1	Amendment No. 1 to Credit Agreement, by and among Sunnova Asset Portfolio 8, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 8 Holdings, LLC, the Lenders party thereto, the Funding Agents party thereto and Banco Popular de Puerto Rico, dated October 13, 2021 (incorporated by reference to Exhibit 10.9.1 to Form 10-K filed on February 24, 2022).
10.7.2∞	Amendment No. 2 to Credit Agreement, by and among Sunnova Asset Portfolio 8, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 8 Holdings, LLC, Banco Popular de Puerto Rico, and U.S. Bank National Association, dated as of November 18, 2022 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on November 23, 2022).

Exhibit No.	Description
10.7.3∞	Amendment No. 3 to Credit Agreement, by and among Sunnova Asset Portfolio 8, LLC, as Borrower, Sunnova SLA Management, LLC, as Manager and Servicer, Sunnova Asset Portfolio 8 Holdings, LLC, as Seller (Solar Loans) and Seller (Solar Assets), and Banco Popular de Puerto Rico, as Agent and Lender, dated as of March 24, 2023 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on March 27, 2023).
10.7.4∞	Amendment No. 4 to Credit Agreement, by and among Sunnova Asset Portfolio 8, LLC, as Borrower, Sunnova SLA Management, LLC, as Manager and Servicer, Sunnova Asset Portfolio 8 Holdings, LLC, as Seller (Solar Loans) and Seller (Solar Assets), Banco Popular de Puerto Rico, as Agent, and the lenders party thereto, dated as of June 8, 2023 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on June 12, 2023).
10.7.5∞	Amendment No. 5 to Credit Agreement, by and among Sunnova Asset Portfolio 8, LLC, as Borrower, Sunnova SLA Management, LLC, as Manager and Servicer, Sunnova Asset Portfolio 8 Holdings, LLC, as Seller (Solar Loans) and Seller (Solar Assets), Banco Popular de Puerto Rico, as Agent, the lenders party thereto, the funding agents party thereto, and U.S. Bank National Association, as Custodian, dated as of August 16, 2023 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on August 21, 2023).
10.8∞	Amended and Restated Credit Agreement, by and among Sunnova TEP Holdings, LLC, Sunnova TE Management, LLC, Credit Suisse AG, New York Branch, the Funding Agents from time to time party thereto, the Lenders from time to time party thereto, Wells Fargo Bank, National Association and U.S. Bank National Association, dated March 29, 2021 (incorporated by reference to Exhibit 10.5 to Form 10-Q filed on April 29, 2021).
10.8.1∞	First Amendment to Amended and Restated Credit Agreement, by and among Sunnova TEP Holdings, LLC, Sunnova TE Management, LLC, Credit Suisse AG, New York Branch, the Funding Agents from time to time party thereto, the Lenders from time to time party thereto, Wells Fargo Bank, National Association and U.S. Bank National Association, dated May 6, 2021 (incorporated by reference to Exhibit 10.1 to Form 10-Q filed on July 29, 2021).
10.8.2	Second Amendment to Amended and Restated Credit Agreement, by and among Sunnova TEP Holdings, LLC, Sunnova TE Management, LLC, Credit Suisse AG, New York Branch, the Funding Agents from time to time party thereto, the Lenders from time to time party thereto, Wells Fargo Bank, National Association and U.S. Bank National Association, dated June 17, 2021 (incorporated by reference to Exhibit 10.6 to Form 10-Q filed on July 29, 2021).
10.8.3	Third Amendment to Amended and Restated Credit Agreement, by and among Sunnova TEP Holdings, LLC, Sunnova TE Management, LLC, Credit Suisse AG, New York Branch, the Funding Agents from time to time party thereto, the Lenders from time to time party thereto, Wells Fargo Bank, National Association and U.S. Bank National Association, dated September 15, 2021 (incorporated by reference to Exhibit 10.3 to Form 10-Q filed on October 28, 2021).
10.8.4∞	Fourth Amendment to Amended and Restated Credit Agreement, by and among Sunnova TEP Holdings, LLC, Sunnova TE Management, LLC, Credit Suisse AG, New York Branch, the Funding Agents from time to time party thereto, the Lenders from time to time party thereto, Wells Fargo Bank, National Association and U.S. Bank National Association, dated October 18, 2021 (incorporated by reference to Exhibit 10.11.4 to Form 10-K filed on February 24, 2022).
10.8.5∞	Omnibus Amendment to Amended and Restated Credit Agreement, by and among Sunnova TEP Holdings, LLC, Sunnova TE Management, LLC, Credit Suisse AG, New York Branch, the Funding Agents from time to time party thereto, the Lenders from time to time party thereto, Wells Fargo Bank, National Association and U.S. Bank National Association, dated October 29, 2021 (incorporated by reference to Exhibit 10.11.5 to Form 10-K filed on February 24, 2022).
10.8.6∞	Sixth Amendment to Amended and Restated Credit Agreement, by and among Sunnova TEP Holdings, LLC, Sunnova TE Management, LLC, Credit Suisse AG, New York Branch, the Funding Agents from time to time party thereto, the Lenders from time to time party thereto, Wells Fargo Bank, National Association and U.S. Bank National Association, dated April 12, 2022 (incorporated by reference to Exhibit 10.1 to Form 10-Q filed on July 28, 2022).
10.8.7∞	Seventh Amendment to Amended and Restated Credit Agreement, among Sunnova TEP Holdings, LLC, Sunnova TE Management, LLC, Credit Suisse AG, New York Branch, as administrative agent, the lenders and other financial institutions party thereto, dated as of September 6, 2022 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on September 8, 2022).

Exhibit No.	Description
10.8.8∞	Eighth Amendment to Amended and Restated Credit Agreement, among Sunnova TEP Holdings, LLC, Sunnova TE Management, LLC, Credit Suisse AG, New York Branch, as administrative agent, and the lenders and other financial institutions party thereto, dated as of October 7, 2022 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on October 12, 2022).
10.8.9∞	Ninth Amendment to Amended and Restated Credit Agreement, among Sunnova TEP Holdings, LLC, Sunnova TE Management, LLC, Atlas Securitized Products Holdings, L.P., as administrative agent, and the lenders and other financial institutions party thereto, dated as of March 29, 2023 (incorporated by reference to Exhibit 10.1 to Form 8-K filed March 31, 2023).
10.8.10∞	Tenth Amendment to Amended and Restated Credit Agreement, among Sunnova TEP Holdings, LLC, Sunnova TE Management, LLC, Atlas Securitized Products Holdings, L.P., as administrative agent, and the lenders and other financial institutions party thereto, dated as of August 31, 2023 (incorporated by reference to Exhibit 10.2 to Form 8-K filed on September 6, 2023).
10.8.11∞	Second Amended and Restated Credit Agreement, among Sunnova TEP Holdings, LLC, Sunnova TE Management, LLC, Atlas Securitized Products Holdings, L.P., as administrative agent, and the lenders and other financial institutions party thereto, dated as of November 3, 2023 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on November 8, 2023).
10.8.12∞	First Amendment to Second Amended and Restated Credit Agreement, among Sunnova TEP Holdings, LLC, Sunnova TE Management, LLC, Atlas Securitized Products Holdings, L.P., as administrative agent, and the lenders and other financial institutions party thereto, dated as of February 14, 2024 (incorporated by reference to Exhibit 10.3 to Form 10-K filed on February 14, 2024).
10.9	Office Building Lease Agreement, between Sunnova Energy Corporation and 20 Greenway Plaza LLC, dated August 29, 2014, for 42,238 square feet of office space known as Suites 350, 475, and 750 of the building located at 20 East Greenway Plaza, Houston, Texas 77046 (incorporated by reference to Exhibit 10.11 to Form S-1 filed on June 27, 2019).
10.9.1	Amendment No. 1 to Office Building Lease Agreement, between Sunnova Energy Corporation and 20 Greenway Plaza LLC, dated as dated May 18, 2015 (incorporated by reference to Exhibit 10.12 to Form S-1 filed on June 27, 2019).
10.9.2	Amendment No. 2 to Office Building Lease Agreement, between Sunnova Energy Corporation and 20 Greenway Plaza LLC, dated June 1, 2015 (incorporated by reference to Exhibit 10.13 to Form S-1 filed on June 27, 2019).
10.9.3	Amendment No. 3 to Office Building Lease Agreement, between Sunnova Energy Corporation and 20 Greenway Plaza LLC, dated November 15, 2018 (incorporated by reference to Exhibit 10.14 to Form S-1 filed on June 27, 2019).
10.9.4	Amendment No. 4 to Office Building Lease Agreement, between Sunnova Energy Corporation and 20 Greenway Plaza LLC, dated May 7, 2019 (incorporated by reference to Exhibit 10.15 to Form S-1 filed on June 27, 2019).
10.9.5	Amendment No. 5 to Office Building Lease Agreement by and between Sunnova Energy Corporation and SCP 20 Greenway, LLC dated September 12, 2019 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on September 13, 2019).
10.10+	Amended and Restated 2013 Stock Option Plan, dated July 29, 2019 (incorporated by reference to Exhibit 10.17 to Form 8-K filed on July 29, 2019).
10.11+	Amended and Restated Stock Option Plan, dated July 29, 2019 (incorporated by reference to Exhibit 10.18 to Form 8-K filed on July 29, 2019).
10.12+	Sunnova Energy International Inc. 2019 Long-Term Incentive Plan and Form of Award Letters (incorporated by reference to Exhibit 10.16 to Form 8-K filed on July 29, 2019).
10.13+	2023 Form of Restricted Stock Unit Award Letter for Executive Officers.
10.14+	Form of Option Award Letter (incorporated by reference to Exhibit 10.22 to Form S-1 filed on June 27, 2019).
10.15+	2023 Form of Standard Option Award Letter.
10.16+	2023 Form of Premium Option Award Letter (Exercise Price 120% of Closing Price).
10.17+	2023 Form of Premium Option Award Letter (Exercise Price 110% of Closing Price).
10.18+	Form of Restricted Stock Unit Award Letter for Non-Employee Director (incorporated by reference to Exhibit 10.23 to Form S-1 filed on June 27, 2019).

Exhibit No.	Description
10.19+	Form of Executive Severance Agreements (incorporated by reference to Exhibit 10.26 to Form S-1/A filed on July 17, 2019).
10.20+	Form of Indemnification Agreement (incorporated by reference to Exhibit 10.27 to Form S-1/A filed on July 3, 2019).
10.21	Board Designation Agreement, by and among Sunnova Energy International, Inc., Kayne Multiple Strategy Fund, L.P., Kayne Solutions Fund, L.P., San Bernardino County Employees' Retirement Association and TFGI Holdings, LLC, dated May 14, 2020 (incorporated by reference to Exhibit 10.7 to Form S-1 filed on June 29, 2020).
10.22∞	Note Purchase Agreement, dated November 3, 2022, among Sunnova Helios X Issuer, LLC, Sunnova Energy Corporation, Sunnova Helios X Depositor, LLC and Credit Suisse Securities (USA) LLC (incorporated by reference to Exhibit 10.19 to Form 10-K filed on February 23, 2023).
10.23	Sunnova Energy International Inc. Retirement Policy for Equity Awards, adopted March 15, 2023 (incorporated by reference to Exhibit 10.3 to Form 10-Q filed on April 27, 2023).
10.24	Retirement and Transition Agreement, dated March 15, 2023, by and among Walter A. Baker and Sunnova Energy International Inc. (incorporated by reference to Exhibit 10.4 to Form 10-Q filed on April 27, 2023).
10.25∞	Credit Agreement, by and among Sunnova Inventory Supply, LLC, the Guarantors party thereto, the lenders and other financial institutions party thereto, and Texas Capital Bank, as administrative agent, dated as of March 10, 2023 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on March 16, 2023).
10.26∞	Resignation and Appointment of Agent Agreement and Assignment of Financing Documents, dated as of March 27, 2023, by and among Credit Suisse AG, New York Branch, as agent, Atlas Securitized Products Holdings, L.P., as successor agent, Sunnova EZ-Own Portfolio, LLC, as borrower, Sunnova SLA Management, LLC, as manager and servicer, Sunnova Asset Portfolio 7 Holdings, LLC, as seller and pledgor, and the lenders party thereto (incorporated by reference to Exhibit 10.6 to Form 10-Q filed on April 27, 2023).
10.27∞	Resignation and Appointment of Agent Agreement and Assignment of Financing Documents, dated as of March 27, 2023, by and among Credit Suisse AG, New York Branch, as administrative agent, Atlas Securitized Products Holdings, L.P., as successor agent, Sunnova TEP Holdings, LLC, as borrower, Sunnova TE Management, LLC, as facility administrator, and the lenders and other financial institutions party thereto (incorporated by reference to Exhibit 10.7 to Form 10-Q filed on April 27, 2023).
10.28∞	Assignment and Assumption Agreement, by and among Sunnova EZ-Own Portfolio, LLC, as borrower, Credit Suisse AG, Cayman Islands Branch, as assignor, Atlas Securitized Products Funding 1, L.P., as assignee, and Credit Suisse AG, New York Branch, as agent, dated as of March 27, 2023 (incorporated by reference to Exhibit 10.10 to Form 10-Q filed on April 27, 2023).
10.29∞	Assignment Agreement, by and among Sunnova TEP Holdings, LLC, as borrower, Credit Suisse AG, Cayman Islands Branch, as assignor, Atlas Securitized Products Funding 1, L.P., as assignee, and Credit Suisse AG, New York Branch, as administrative agent, dated as of March 27, 2023 (incorporated by reference to Exhibit 10.11 to Form 10-Q filed on April 27, 2023).
10.30∞	Credit Agreement, by and among Sunnova Asset Portfolio 9, LLC, Sunnova SLA Management, LLC, Sunnova Asset Portfolio 9 Holdings, LLC, the lenders and other financial institutions party thereto and Citibank, N.A., as administrative agent, dated as of September 5, 2023 (incorporated by reference to Exhibit 10.3 to Form 8-K filed on September 6, 2023).
10.31∞	Loan Guarantee Agreement, dated as of September 27, 2023, by and among Sunnova Energy Corporation, as sponsor, Sunnova ABS Management, LLC, as servicer and manager, and the United States Department of Energy, as guarantor (incorporated by reference to Exhibit 10.1 to Form 8-K filed on September 28, 2023).
10.32∞	Master Revolving Loan Agreement, by and among Sunnova Business Markets Borrower, LLC, as borrower, each subsidiary of Sunnova Business Markets Borrower, LLC from time to time party thereto, each lender from time to time party thereto and Mitsubishi HC Capital America, Inc., as administrative agent, dated as of December 27, 2023 (incorporated by reference to Exhibit 10.1 to Form 8-K filed on January 3, 2024).
19	Sunnova Energy International Inc. Insider Trading Policy.
21.1	List of Subsidiaries of the Registrant.
23.1	Consent of Independent Registered Public Accounting Firm.
31.1	Certification of Chief Executive Officer, pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Certification of Chief Financial Officer, pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.

Exhibit No.	Description
32.1	Certification of Chief Executive Officer, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
32.2	Certification of Chief Financial Officer, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
97.1	Sunnova Energy International Inc. Policy for the Recovery of Erroneously Awarded Compensation.
101.INS	XBRL Instance Document - the instance document does not appear in the Interactive Data File because its tags are embedded within the inline XBRL document.
101.SCH	XBRL Taxonomy Extension Schema Linkbase Document.
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document.
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document.
101.LAB	XBRL Taxonomy Extension Label Linkbase Document.
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document.
104	Cover Page Interactive Data File (embedded within the inline XBRL document).

∞ Portions of this exhibit have been omitted.
\+ Indicates management contract or compensatory plan.

SIGNATURES

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

SUNNOVA ENERGY INTERNATIONAL INC.

Date: February 22, 2024 By: /s/ William J. Berger

William J. Berger
Chief Executive Officer and Director
(Principal Executive Officer)

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

Signature	Title	Date
/s/ William J. Berger William J. Berger	Chief Executive Officer and Director *(Principal Executive Officer)*	February 22, 2024
/s/ Robert L. Lane Robert L. Lane	Chief Financial Officer *(Principal Financial and Accounting Officer)*	February 22, 2024
/s/ Anne Slaughter Andrew Anne Slaughter Andrew	Director	February 22, 2024
/s/ Nora Brownell Nora Brownell	Director	February 22, 2024
/s/ Rahman D'Argenio Rahman D'Argenio	Director	February 22, 2024
/s/ Mark Longstreth Mark Longstreth	Director	February 22, 2024
/s/ Akbar Mohamed Akbar Mohamed	Director	February 22, 2024
/s/ Michael C. Morgan Michael C. Morgan	Director	February 22, 2024
/s/ C. Park Shaper C. Park Shaper	Director	February 22, 2024
/s/ Mary Yang Mary Yang	Director	February 22, 2024