Tesla, Inc.
Form 10-K
February 19, 2019

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

(Mark One)

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2018

OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from to

Commission File Number: 001-34756

Tesla, Inc.

(Exact name of registrant as specified in its charter)

Delaware	91-2197729
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
3500 Deer Creek Road Palo Alto, California (Address of principal executive offices)	94304 (Zip Code)

(650) 681-5000

(Registrant's telephone number, including area code)

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

Title of each class	Name of each exchange on which registered
Common Stock, $0.001 par value	The NASDAQ Stock Market LLC

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

None

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

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the 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 ("Exchange Act") 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 if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

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 is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes No

The aggregate market value of voting stock held by non-affiliates of the registrant, as of June 30, 2018, the last day of the registrant's most recently completed second fiscal quarter, was $46.57 billion (based on the closing price for shares of the registrant's Common Stock as reported by the NASDAQ Global Select Market on June 30, 2018). Shares of Common Stock held by each executive officer, director, and holder of 5% or more of the outstanding Common Stock have been excluded in that such persons may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

As of February 12, 2019, there were 172,721,487 shares of the registrant's Common Stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Proxy Statement for the 2019 Annual Meeting of Stockholders are incorporated herein by reference in Part III of this Annual Report on Form 10-K to the extent stated herein. Such proxy statement will be filed with the Securities and Exchange Commission within 120 days of the registrant's fiscal year ended December 31, 2018.

TESLA, INC.

ANNUAL REPORT ON FORM 10-K FOR THE YEAR ENDED DECEMBER 31, 2018

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Forward-Looking Statements

The discussions in this Annual Report on Form 10-K contain forward-looking statements reflecting our current expectations that involve risks and uncertainties. These forward-looking statements include, but are not limited to, statements concerning our strategy, future operations, future financial position, future revenues, projected costs, profitability, expected cost reductions, capital adequacy, expectations regarding demand and acceptance for our technologies, growth opportunities and trends in the market in which we operate, prospects and plans and objectives of management. The words “anticipates,” “believes,” “could,” “estimates,” “expects,” “intends,” “may,” “plans,” “projects,” “v and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements that we make. These forward-looking statements involve risks and uncertainties that could cause our actual results to differ materially from those in the forward-looking statements, including, without limitation, the risks set forth in Part I, Item 1A, “Risk Factors” in this Annual Report on Form 10-K and in our other filings with the Securities and Exchange Commission. We do not assume any obligation to update any forward-looking statements.

PART I

ITEM 1. BUSINESS

Overview

We design, develop, manufacture and sell high-performance fully electric vehicles ("EVs") and energy generation and storage systems, and also install and maintain such energy systems and sell solar electricity. We are the world's first vertically integrated sustainable energy company, offering end-to-end clean energy products, including generation, storage and consumption. We have established and continue to grow a global network of stores, galleries, vehicle service centers, Mobile Service technicians, body shops, Supercharger stations and Destination Chargers to accelerate the widespread adoption of our products, and we continue to develop self-driving capability in order to improve vehicle safety. Our sustainable energy products, engineering expertise, intense focus to accelerate the world's transition to sustainable energy, and business model differentiate us from other companies.

We currently produce and sell three fully electric vehicles: the Model S sedan, the Model X sport utility vehicle ("SUV") and the Model 3 sedan. All of our vehicles offer high performance and functionality as well as attractive styling.

We commenced deliveries of Model S in June 2012 and have continued to improve Model S by introducing performance, all-wheel drive dual motor, and Autopilot options, as well as free over-the-air software updates. We commenced deliveries of Model X in September 2015. Model X offers seating for up to seven people, all-wheel drive, and our Autopilot functionality. We commenced deliveries of Model 3, a lower-priced sedan designed for the mass market, in July 2017, and we have significantly ramped its production. We are now embarking on the delivery of Model 3 in international markets and are focusing on lowering manufacturing costs while continuing to increase its production rate.

We also intend to bring additional all-electric vehicles to market in the future, including Model Y, the Tesla Semi truck, a pickup truck and a new version of the Tesla Roadster. The production of fully electric vehicles that meet consumers' range and performance expectations requires substantial design, engineering, and integration work on almost every system of our vehicles. Our design and vehicle engineering capabilities, combined with the technical advancements of our powertrain system, have enabled us to design and develop electric vehicles that we believe overcome the design, styling, and performance issues that have historically limited broad adoption of electric vehicles. As a result, our customers enjoy several benefits, including:

- Long Range and Recharging Flexibility. Our vehicles offer ranges that significantly exceed those of any other commercially available electric vehicle. In addition, our vehicles incorporate our proprietary on-board charging system, permitting recharging from almost any available electrical outlet, and also offer fast charging capability from our proprietary Supercharger network.
- High-Performance Without Compromised Design or Functionality. Our vehicles deliver instantaneous and sustained acceleration, an advanced Autopilot system with active safety and convenience features, and over-the-air software updates.
- Energy Efficiency and Cost of Ownership. Our vehicles offer an attractive cost of ownership compared to internal combustion engine or hybrid electric vehicles. Using only an electric powertrain enables us to create more energy-efficient vehicles that are mechanically simpler than currently available hybrid or internal combustion engine vehicles. The cost to charge our vehicles is less compared to fueling internal combustion vehicles. We also expect our electric vehicles will have lower relative maintenance costs than other vehicles due to fewer moving parts and the absence of certain components, including oil, oil filters, spark plugs and engine valves.

We sell our vehicles through our own sales and service network which we are continuing to grow globally. The benefits we receive from distribution ownership enable us to improve the overall customer experience, the speed of product development and the capital efficiency of our business. We are also continuing to build our network of Superchargers and Destination Chargers in North America, Europe and Asia to provide alternative convenient options for fast charging.

In addition, we are leveraging our technological expertise in batteries, power electronics, and integrated systems to manufacture and sell energy storage products. In late 2016, we began production and deliveries of our latest generation energy storage products, Powerwall 2 and Powerpack 2. Powerwall 2 is a 14 kilowatt hour ("kWh") home battery with an integrated inverter. Powerpack 2 is an infinitely scalable energy storage system for commercial, industrial and utility applications, comprised of up to 210 kWh (AC) battery packs and up to 650 kVa (at 480V) inverters. Similar to our electric vehicles, our energy storage products have been developed to receive over-the-air firmware and software updates that enable additional features over time.

Finally, we sell and lease solar energy systems (with or without accompanying energy storage systems) to residential and commercial customers and sell renewable energy to residential and commercial customers at prices that are typically below utility rates. Since 2006, we have installed solar energy systems for hundreds of thousands of customers. However, the electricity produced by our solar installations represents a very small fraction of total U.S. electricity generation. With tens of millions of single-family homes and businesses in our primary service territories, and many more in other locations, we have a large opportunity to expand and grow this business. We believe that residential solar energy generation is gaining momentum, as exemplified in part by the state of California recently requiring that new homes be built with solar generation starting in 2020. We also intend to ramp production of our innovative Solar Roof product.

We manufacture our vehicle products primarily at our facilities in Fremont, California, Lathrop, California, Tilburg, Netherlands and at our Gigafactory 1 near Reno, Nevada. We manufacture our energy storage products at Gigafactory 1 and Tesla solar products at our U.S. facilities including in Buffalo, New York (Gigafactory 2). In January 2019, we began construction of our Gigafactory Shanghai in China, where we intend to commence production of certain trims of Model 3 for the local market by the end of 2019.

Our Products and Services

Vehicles

Model S

Model S is a fully electric, four-door, five-adult passenger sedan that offers compelling range and high performance and our all-wheel drive dual motor system, which we also offer in a performance version. Model S 100D is the longest range all-electric production sedan in the world, and the performance version with the Ludicrous speed upgrade is the quickest accelerating production vehicle available.

Model S introduced a 17 inch touch screen driver interface, our advanced Autopilot hardware to enable both active safety and convenience features, and over-the-air software updates. We believe the combination of performance, safety, styling, convenience and energy efficiency of Model S positions it as a compelling alternative to other vehicles in the luxury and performance segments.

Model X

Model X is the longest range all-electric production sport utility vehicle in the world, and offers high performance features such as our fully electric, all-wheel drive dual motor system and our Autopilot system. Model X can seat up to seven adults and incorporates a unique falcon wing door system for easy access to the second and third seating rows. Model X is sold in all markets where Model S is available.

Model 3

Model 3 is our third generation electric vehicle, which we began delivering in July 2017. Model 3 and its drive units are currently produced at high volumes at the Tesla Factory in Fremont, California and at Gigafactory 1, respectively, and we intend to begin production of certain vehicle trims for China at our Gigafactory Shanghai by the end of 2019. We have offered a number of variants of Model 3, including performance, dual motor, single motor, long-range and medium-range, and intend to offer in the future a variant of Model 3 at a starting price of $35,000. We are now embarking on the delivery of Model 3 in international markets and are focusing on lowering manufacturing costs while continuing to increase its production rate.

Future Consumer and Commercial EVs

In addition to our volume-produced consumer EVs, including future vehicles such as Model Y and a pickup truck, we are planning to introduce additional types of vehicles to address a broader cross-section of the vehicle market, including commercial EVs such as the Tesla Semi truck, and a new version of the Tesla Roadster. We have started to accept reservations for the Tesla Semi truck and the new Tesla Roadster.

Energy Storage

Using the energy management technologies and manufacturing processes developed for our vehicle powertrain systems, we developed energy storage products for use in homes, commercial facilities and on the utility grid. Advances in battery architecture, thermal management and power electronics that were originally commercialized in our vehicles are now being leveraged in our energy storage products. Our energy storage systems are used for numerous applications including backup power, grid independence, peak demand reduction, demand response, reducing intermittency of renewable generation, replacement of fossil fuel generation and wholesale electric market services.

Our energy product portfolio includes systems with a wide range of applications, from residential to large grid-scale projects. Powerwall 2 is a 14 kWh rechargeable lithium-ion battery designed to store energy at a home or small commercial facility and can be used to provide seamless backup power in a grid outage and to maximize self-consumption of solar power generation. In addition, we offer the Powerpack 2 system, a fully integrated energy storage solution comprised of up to 210kWh (AC) battery packs and up to 650 kVa (at 480V) inverters that can be grouped together to form megawatt hour (“MWh”) and gigawatt hour (“GWh”) sized installations. The Powerpack 2 system can be used by commercial and industrial customers for peak shaving, load shifting, self-consumption of solar generation and demand response, as well as to provide backup power during grid outages, and by utilities and independent power producers to smooth and firm the output of renewable power generation sources, provide dynamic energy capacity to the grid, defer or eliminate the need to upgrade transmission or distribution infrastructure, and provide a variety of other grid services such as frequency regulation and voltage control. Powerpack 2 can also be combined with renewable energy generation sources to create microgrids that provide communities with clean, resilient and affordable power.

Along with designing and manufacturing energy storage products, we continue to develop and advance our software capabilities for the control and optimal dispatch of energy storage systems across a wide range of markets and applications.

Solar Energy Systems

The major components of our solar energy systems include solar panels that convert sunlight into electrical current, inverters that convert the electrical output from the panels to a usable current compatible with the electric grid, racking that attaches the solar panels to the roof or ground, electrical hardware that connects the solar energy system to the electric grid, and our monitoring device. While we have recently started manufacturing solar panels at Gigafactory 2 in collaboration with Panasonic, we currently purchase the majority of system components from vendors, maintaining multiple sources for each major component to ensure competitive pricing and an adequate supply of materials. We also design and manufacture other system components.

The residential solar energy systems that we sell enable our customers to take direct advantage of federal tax credits to reduce their electricity costs. Our solar loan offering enables customers to own their solar energy systems with little upfront cost. We also continue to offer lease and power purchase agreement (“PPA”) options to both residential and commercial customers. Our current standard leases and PPAs have a 20-year term, and we typically offer customers

the opportunity to renew their agreements.

In October 2016, we unveiled Solar Roof, which integrates solar energy production with aesthetically pleasing and durable glass roofing tiles and is designed to complement the architecture of homes and commercial buildings while turning sunlight into electricity. We have been installing this product at a slow pace to gather learnings about our design and installation processes, and plan to ramp the production of Solar Roof with significantly improved manufacturing capabilities during 2019.

Technology

Vehicles

Our core competencies are powertrain engineering, vehicle engineering, innovative manufacturing and energy storage. Our core intellectual property includes our electric powertrain, our ability to design vehicles that utilize the unique advantages of an electric powertrain and our development of self-driving technologies. Our powertrain consists of our battery pack, power electronics, motor, gearbox and control software. We offer several powertrain variants for our vehicles that incorporate years of research and development. In addition, we have designed our vehicles to incorporate the latest advances in consumer technologies, such as mobile computing, sensing, displays, and connectivity.

Battery Pack

We design our battery packs to achieve high energy density at a low cost while also maintaining safety, reliability and long life. Our proprietary technology includes systems for high density energy storage, cooling, safety, charge balancing, structural durability, and electronics management. We have also pioneered advanced manufacturing techniques to manufacture large volumes of battery packs with high quality at low cost.

We have significant expertise in the safety and management systems needed to use lithium-ion cells in the automotive environment, and have further optimized cell designs to increase overall performance. These advancements have enabled us to improve over time the cost and performance of our batteries.

Our engineering and manufacturing efforts have been performed with a longer-term goal of building a foundation for further development. For instance, we have designed our battery pack to permit flexibility with respect to battery cell chemistry and form factor. We maintain extensive testing and R&D capabilities at the individual cell level, the full battery-pack level and on other critical battery pack systems, and have built an expansive body of knowledge on lithium-ion cell vendors, chemistry types, and performance characteristics. We believe that the flexibility of our designs, combined with our research and real-world performance data, will enable us to continue to evaluate new battery cells and optimize battery pack system performance and cost for our current and future vehicles.

Power Electronics

The power electronics in our electric vehicle powertrain govern the flow of high voltage electrical current throughout our vehicles and serve to power our electric motor to generate torque while driving and deliver energy into the battery pack while charging.

The drive inverter converts direct current from the battery pack into alternating current to drive our induction and permanent magnet motors and provides “regenerative braking” functionality, which captures energy from the wheels to charge the battery pack. The primary technological advantages to our designs include the ability to drive large amounts of current in a small physical package with high efficiency and low cost.

The charger charges the battery pack by converting alternating current (usually from a wall outlet or other electricity source) into direct current that can be accepted by the battery. Tesla vehicles can recharge on a wide variety of electricity sources due to the design of this charger, from a common household outlet to high power circuits meant for more industrial uses.

Dual Motor Powertrain

We offer dual motor powertrain vehicles, which use two electric motors to maximize traction and performance in an all-wheel drive configuration. Tesla's dual motor powertrain digitally and independently controls torque to the front and rear wheels. The near-instantaneous response of the motors, combined with low centers of gravity, provides drivers with controlled performance and increased traction control.

Vehicle Control and Infotainment Software

The performance and safety systems of our vehicles and their battery packs require sophisticated control software. There are numerous processors in our vehicles to control these functions, and we write custom firmware for many of these processors. Software algorithms control traction, vehicle stability, the acceleration and regenerative braking of the vehicle, climate control and thermal management, and are also used extensively to monitor the charge state of the battery pack and to manage all of its safety systems. Drivers use the information and control systems in our vehicles to optimize performance, customize vehicle behavior, manage charging modes and times and control all infotainment functions. We develop almost all of this software, including most of the user interfaces, internally.

Self-Driving Development

We have expertise in developing self-driving systems, and currently offer in our vehicles an advanced driver assist system that we refer to as Autopilot, including auto-steering, traffic aware cruise control, automated lane changing, automated parking, Summon and driver warning systems. In October 2016, we began equipping all Tesla vehicles with hardware needed for full self-driving capability, including cameras that provide 360 degree visibility, updated ultrasonic sensors for object detection, a forward-facing radar with enhanced processing, and a powerful new onboard computer. Our Autopilot systems relieve our drivers of the most tedious and potentially dangerous aspects of road travel. Although, at present, the driver is ultimately responsible for controlling the vehicle, our system provides safety and convenience functionality that allows our customers to rely on it much like the system that airplane pilots use when conditions permit. This hardware suite, along with over-the-air firmware updates and field data feedback loops from the onboard camera, radar, ultrasonics, and GPS, enables the system to continually learn and improve its performance.

Additionally, we continue to make significant advancements in the development of fully self-driving technologies.

Energy Storage

We are leveraging many of the component-level technologies from our vehicles to advance our energy storage products, including high density energy storage, cooling, safety, charge balancing, structural durability, and electronics management. By taking a modular approach to the design of battery systems, we are able to maximize manufacturing capacity to produce both Powerwall and Powerpack products. Additionally, we are making significant strides in the area of bi-directional, grid-tied power electronics that enable us to interconnect our battery systems seamlessly with global electricity grids while providing fast-acting systems for power injection and absorption.

Solar Energy Systems

We are continually innovating and developing new technologies to facilitate the growth of our solar energy systems business. For example, Solar Roof is being designed to work seamlessly with Tesla Powerwall 2 and we have developed proprietary software to reduce system design and installation timelines and costs.

Design and Engineering

Vehicles

In addition to the design, development and production of the powertrain, we have created significant in-house capabilities in the design and engineering of electric vehicles and their components and systems. We design and engineer bodies, chassis, interiors, heating and cooling and low voltage electrical systems in-house, and to a lesser extent, in conjunction with our suppliers. Our team has core competencies in computer aided design and crash test

simulations, which reduces the product development time of new models.

Additionally, our team has expertise in lightweight materials, a very important characteristic for electric vehicles given the impact of mass on range. Model S and Model X are built with a lightweight aluminum body and chassis which incorporate a variety of materials and production methods that help optimize the weight of the vehicle. Moreover, we have designed Model 3 with a mix of materials to be lightweight and safe while also increasing cost-effectiveness for this mass-market vehicle. We are designing Model Y on the Model 3 platform and expect that Model Y will share about 75% of its components with Model 3, which we expect will reduce the cost and time to ramp production of Model Y.

Energy Storage

We have an in-house engineering team that both designs our energy storage products themselves, and works with our residential, commercial and utility customers to design bespoke systems incorporating our products. Our team's expertise in electrical, mechanical, civil and software engineering enables us to create integrated energy storage solutions that meet the particular needs of all customer types.

Solar Energy Systems

We also have an in-house engineering team that designs a customized solar energy system or Solar Roof for each of our customers, and which works closely with our energy storage engineering teams to integrate an energy storage system when requested by the customer. We have developed software that simplifies and expedites the design process and optimizes the design to maximize the energy production of each system. Our engineers complete a structural analysis of each building and produce a full set of structural design and electrical blueprints that contain the specifications for all system components. Additionally, we design complementary mounting and grounding hardware where required.

Sales and Marketing

Vehicles

Company-Owned Stores and Galleries

We market and sell our vehicles directly to consumers through an international network of company-owned stores and galleries, which we believe enables us to better control costs of inventory, manage warranty service and pricing, maintain and strengthen the Tesla brand, and obtain rapid customer feedback. Our Tesla stores and galleries are highly visible, premium outlets in major metropolitan markets, some of which combine retail sales and service. We have also found that opening a service center in a new geographic area can increase demand. As a result, we have complemented our store strategy with sales facilities and personnel in service centers to more rapidly expand our retail footprint. We refer to these as "Service Plus" locations.

Used Car Sales

Our used car business supports new car sales by integrating the sale of a new Tesla vehicle with a customer's trade-in needs for their existing Tesla and non-Tesla vehicles. The Tesla and non-Tesla vehicles we acquire through trade-ins are subsequently remarketed, either directly by us or through third-party auto auctions. We also receive used Tesla vehicles to resell through lease returns and other sources.

Charging

When not charging at home or at work, Tesla customers can also charge using our Supercharger and Destination Charging networks. In addition, our vehicles can charge at a variety of public charging stations around the world, either natively or through a suite of adapters. This flexibility provides our customers with many charging options to suit various situations.

We continue to build out our Tesla Supercharger network throughout North America, Europe, Asia and other markets for our customers' convenience, including to enable long-distance travel and urban ownership. Our Supercharger network is a strategic corporate initiative designed to provide publicly accessible fast charging solutions, and remove a barrier to the broader adoption of electric vehicles caused by the perception of limited vehicle range. The Tesla Supercharger is an industrial grade, high speed charger designed to recharge a Tesla vehicle significantly more quickly than other charging options, and we continue to evolve our technology to allow for even faster charging times at lower cost to us. To satisfy growing demand, Supercharger stations typically have between six and thirty Superchargers and are strategically placed along well-traveled routes and in dense city centers to allow Tesla vehicle owners the ability to enjoy quick, reliable and ubiquitous charging with convenient, minimal stops. Use of the Supercharger network is either free or requires a competitive fee.

We work with a wide variety of hospitality, retail, and public destinations, as well as businesses with commuting employees, to offer additional charging options for our customers. These Destination Charging and workplace locations deploy Tesla Wall Connectors to provide charging to Tesla vehicle owners who patronize or are employed at their businesses. We also work with single-family homeowners and multi-family residential entities to deploy home charging solutions in our communities.

Where possible, we are co-locating Superchargers with our solar and energy storage systems to reduce the cost of electricity and promote the use of renewable electricity by Tesla vehicle owners.

Orders

We offer our customers the flexibility to order vehicles with their desired trims and options by visiting us online at our website or in person at our Tesla stores.

Marketing

Historically, we have been able to generate significant media coverage of our company and our vehicles, and we believe we will continue to do so. To date, media coverage and word of mouth have been the primary drivers of our vehicle sales leads and have helped us achieve sales without traditional advertising and at relatively low marketing costs.

Solar and Energy Storage

We market and sell our solar and energy storage products to individuals, commercial and industrial customers and utilities through a variety of channels.

In the U.S., we have been transitioning the direct sales channel for residential solar and energy storage products from former partners to our stores and galleries. We are also continuing to sell residential energy storage products through our network of channel partners. Outside of the U.S., we use our international sales organization and a network of channel partners to market and sell residential energy storage products, and we have recently launched pilot programs for the sale of residential solar in certain countries. We also sell Powerwall 2 directly to utilities, who then deploy the product in customer homes.

We sell Powerpack 2 systems to commercial and utility customers through our international sales organization, which consists of experienced energy industry professionals in all of our target markets, as well as through our channel partner network. In the U.S and Mexico, we also sell installed solar energy systems (with or without energy storage) to commercial customers through cash, lease and PPA transactions.

Service and Warranty

Vehicles

Service

We provide service for our electric vehicles at our company-owned service centers, at our Service Plus locations or through an expanding fleet of Tesla Mobile Service technicians who provide services that do not require a vehicle lift. Performing vehicle service ourselves allows us to identify problems, find solutions, and incorporate improvements faster than incumbent automobile manufacturers.

Our vehicles are designed with the capability to wirelessly upload data to us via an on-board system with cellular connectivity, allowing us to diagnose and remedy many problems before ever looking at the vehicle. When maintenance or service is required, a customer can schedule service by contacting one of our Tesla service centers or our Mobile Service technicians can perform an array of services from a customer's home or other remote location.

New Vehicle Limited Warranty, Maintenance and Extended Service Plans

We provide a four year or 50,000 mile New Vehicle Limited Warranty with every new vehicle, subject to separate limited warranties for the supplemental restraint system and battery and drive unit. For the battery and drive unit on our current new Model S and Model X vehicles, we offer an eight year, infinite mile limited warranty, although the battery's charging capacity is not covered. For the battery and drive unit on our current new Model 3 vehicles, we offer an eight year or 100,000 mile limited warranty for our standard or mid-range battery and an eight year or 120,000 mile limited warranty for our long range battery, with minimum 70% retention of battery capacity over the warranty period.

In addition to the New Vehicle Limited Warranty, we currently offer for Model S and Model X a comprehensive maintenance program for every new vehicle, which includes plans covering prepaid maintenance for up to four years or up to 50,000 miles and an Extended Service plan. The maintenance plans cover annual inspections and the replacement of certain wear and tear parts, excluding tires and the battery. The Extended Service plan covers the repair or replacement of vehicle parts for up to an additional four years or up to an additional 50,000 miles after the New Vehicle Limited Warranty.

Energy Storage

We generally provide a 10 year "no defect" and "energy retention" warranty with every Powerwall 2 and a 15 year "no defect" and "energy retention" warranty with every Powerpack 2 system. For Powerwall 2, the energy retention warranty involves us guaranteeing that the energy capacity of the product will be 70% or 80% (depending on the region of installation) of its nameplate capacity after 10 years of use. For Powerpack 2, the energy retention warranty involves us guaranteeing a minimum energy capacity in each of its first 15 years of use. For both products, our warranty is subject to specified use restrictions or kWh throughput caps. In addition, we offer certain extended warranties, which customers are able to purchase from us at the time they purchase an energy storage system, including a 20 year extended protection plan for Powerwall 2 and a selection of 10 or 20 year performance guarantees for Powerpack 2. We agree to repair or replace our energy storage products in the event of a valid warranty claim. In circumstances where we install a Powerwall 2 or Powerpack 2 system, we also provide warranties of up to 20 years on our installation workmanship. All of the warranties for our energy storage systems are subject to customary limitations and exclusions.

Solar Energy Systems

For traditional solar energy systems, we provide a workmanship warranty for up to 20 years from installation and a separate warranty against roof leaks. We also pass-through the inverter and module manufacturer warranties (typically 12 years and 25 years respectively). When we lease a traditional solar energy system, we compensate the customer if their system produces less energy than guaranteed over a specified period. For Solar Roof, we provide a warranty against glass tile chipping or cracking for the lifetime of the home, a 30 year installation warranty, a 30 year weatherization warranty and a power output warranty. For all systems (traditional and Solar Roof) we also provide service and repair (either under warranty or for a fee) during the entire term of the customer relationship.

Financial Services

Vehicles

We offer financing arrangements for our vehicles in North America, Europe and Asia primarily through various financial institutions. We also currently offer Model S and Model X leasing directly through our local subsidiaries in the U.S. and Canada. We intend to broaden our financial services offerings during the next few years.

Certain of our current financing programs outside of North America provide customers with a resale value guarantee under which those customers have the option of selling their vehicle back to us at a preset future date, generally at the end of the term of the applicable loan or financing program, for a pre-determined resale value. In certain markets, we also offer vehicle buyback guarantees to financial institutions, which may obligate us to repurchase the vehicles for a pre-determined price.

Solar Energy Systems

We are an industry leader in offering innovative financing alternatives that allow our customers to take direct advantage of available tax credits and incentives to reduce the cost of owning a solar energy system through a solar loan, or to make the switch to solar energy with little to no upfront costs under a lease or PPA. Our solar loan offers third-party financing directly to a qualified customer to enable the customer to purchase and own a solar energy system. We are not a party to the loan agreement between the customer and the third-party lender, and the third-party lender has no recourse against us with respect to the loan. Our solar lease offers customers a fixed monthly fee, at rates that typically translate into lower monthly utility bills, and an electricity production guarantee. Our solar PPA charges customers a fee per kWh based on the amount of electricity produced by our solar energy systems. We monetize the customer payments we receive from our leases and PPAs through funds we have formed with investors. We also intend to introduce financial services offerings for our Solar Roof customers in the future.

Energy Storage

We currently offer a loan product to residential customers who purchase Powerwall 2 together with a new solar energy system, and lease and PPAs to commercial customers who purchase a Powerpack 2 system together with a new solar energy system. We intend to introduce financial services offerings for customers who purchase standalone energy storage products in the future.

Manufacturing

Vehicles

We conduct vehicle manufacturing and assembly operations at our facilities in Fremont, California; Lathrop, California; and Tilburg, Netherlands. We have also built and continue to expand Gigafactory 1, a manufacturing facility for battery cells, modules, packs and storage products and vehicle components, outside of Reno, Nevada. We are also constructing Gigafactory Shanghai, a manufacturing facility in China, for the production of Model 3 vehicles for the local market.

Manufacturing Facilities in Fremont, CA and Lathrop, CA

We manufacture our vehicles, and certain parts and components that are critical to our intellectual property and quality standards, at our manufacturing facilities in Fremont, CA, including the Tesla Factory, and our manufacturing facility in Lathrop, CA. Our Fremont facilities contain several manufacturing operations, including stamping, machining, casting, plastics, body assembly, paint operations, drive unit production, seat assembly, final vehicle assembly and end-of-line testing. In addition, we manufacture lithium-ion battery packs, electric motors, gearboxes and components for Model S and Model X at the Tesla Factory. Some major vehicle component systems are purchased from suppliers; however, we have a high level of vertical integration in our manufacturing processes at the Tesla Factory.

The Netherlands

Our European headquarters and manufacturing facilities are located in Amsterdam and Tilburg. Our operations in Tilburg include final assembly, testing and quality control for Model S and Model X vehicles delivered within the European Union, a parts distribution warehouse for service centers throughout Europe, a center for remanufacturing work and a customer service center.

Gigafactory 1 outside of Reno, Nevada

Gigafactory 1 is a facility where we work together with our suppliers to integrate battery material, cell, module and battery pack production in one location. We use the battery packs manufactured at Gigafactory 1 for our vehicles, including Model 3, and energy storage products. We also manufacture Model 3 drive units at Gigafactory 1.

Gigafactory 1 is being built in phases. Tesla, Panasonic and other partners are currently manufacturing inside the finished sections. Our present plan is to continue expanding Gigafactory 1 over the next few years so that its capacity significantly exceeds the approximately 500,000 vehicle per year capacity that we announced when we first started developing it, and we have additionally added capacity for manufacturing our energy storage products. We have also announced that we will likely manufacture Model Y, which we intend to produce at high volumes by the end of 2020, at Gigafactory 1.

We believe that Gigafactory 1 will allow us to achieve a significant reduction in the cost of our battery packs with our volume production of Model 3. We have an agreement with Panasonic to partner with us on Gigafactory 1 with investments in production equipment that it is using to manufacture and supply us with battery cells. Through our ownership of Gigafactory 1 and our partnership with Panasonic, we own sole access to a facility designed to be the highest-volume and lowest-cost source of lithium-ion batteries in the world.

Gigafactory Shanghai

We are constructing Gigafactory Shanghai in order to significantly increase the affordability of Model 3 for customers in China by reducing transportation and manufacturing costs and eliminating certain tariffs on vehicles imported from the U.S. We broke ground in January 2019, and subject to a number of uncertainties, including regulatory approval, supply chain constraints, and the pace of installing production equipment and bringing the factory online, we expect to begin production of certain trims of Model 3 at Gigafactory Shanghai by the end of 2019. We expect much of the investment in Gigafactory Shanghai to be provided through local debt financing, supported by limited direct capital expenditures by us. Moreover, we are targeting the capital expenditures per unit of production capacity at this factory to be less than that of our Model 3 production at the Tesla Factory, from which we have drawn learnings that should allow us to simplify our manufacturing layout and processes at Gigafactory Shanghai.

Supply Chain

Our vehicles use thousands of purchased parts which we source globally from hundreds of suppliers. We have developed close relationships with several key suppliers particularly in the procurement of cells and certain other key system parts. While we obtain components from multiple sources in some cases, similar to other automobile manufacturers, many of the components used in our vehicles are purchased by us from a single source. In addition, while several sources of the battery cell we have selected for our battery packs are available, we have currently fully qualified only one cell supplier for the battery packs we use in our production vehicles. We are working to fully qualify additional cells from other manufacturers.

We use various raw materials in our business including aluminum, steel, cobalt, lithium, nickel and copper. The prices for these raw materials fluctuate depending on market conditions and global demand for these materials. We believe that we have adequate supplies or sources of availability of the raw materials necessary to meet our manufacturing and supply requirements.

Energy Storage

Our energy storage products are manufactured at Gigafactory 1. We leverage the same supply chain process and infrastructure as we use for our vehicles. The battery architecture and many of the components used in our energy storage products are the same or similar to those used in our vehicles' battery pack, enabling us to take advantage of manufacturing efficiencies and supply chain economies of scale. The power electronics and inverters for the Powerwall and Powerpack systems are also manufactured at Gigafactory 1, allowing us to ship deployment-ready systems directly to customers.

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Solar Energy Systems

We currently purchase major components such as solar panels and inverters directly from multiple manufacturers. We typically purchase solar panels and inverters on an as-needed basis from our suppliers at then-prevailing prices pursuant to purchase orders issued under our master contractual arrangements. In December 2016, we entered into a long-term agreement with Panasonic to manufacture photovoltaic ("PV") cells and modules with negotiated pricing provisions at our Gigafactory 2 in Buffalo, New York with the intended capacity to manufacture at least 1.0 gigawatt ("GW") of solar products annually. We have recently started manufacturing solar panels at this facility in collaboration with Panasonic.

Governmental Programs, Incentives and Regulations

Vehicles

California Alternative Energy and Advanced Transportation Financing Authority Tax Incentives

We have entered into multiple agreements over the past few years with the California Alternative Energy and Advanced Transportation Financing Authority ("CAEATFA") that provide multi-year sales tax exclusions on purchases of manufacturing equipment that will be used for specific purposes, including the expansion and ongoing development of Model S, Model X, Model 3 and future electric vehicles and the expansion of electric vehicle powertrain production in California.

Nevada Tax Incentives

In connection with the construction of Gigafactory 1, we have entered into agreements with the State of Nevada and Storey County in Nevada that provide abatements for sales, use, real property, personal property and employer excise taxes, discounts to the base tariff energy rates and transferable tax credits. These incentives are available for the applicable periods beginning on October 17, 2014 and ending on either June 30, 2024 or June 30, 2034 (depending on the incentive). Under these agreements, we were eligible for a maximum of $195.0 million of transferable tax credits, subject to capital investments by us and our partners for Gigafactory 1 of at least $3.50 billion, which we exceeded during 2017, and specified hiring targets for Gigafactory 1, which we exceeded during 2018. As a result, as of December 31, 2018, we had earned the maximum amount of credits.

Tesla Regulatory Credits

In connection with the production, delivery, placement into service and ongoing operation of our zero emission vehicles, charging infrastructure and solar systems in global markets, we have earned and will continue to earn various tradable regulatory credits. We have sold these credits, and will continue to sell future credits, to automotive companies and other regulated entities who can use the credits to comply with emission standards and other regulatory requirements. For example, under California's Zero Emission Vehicle Regulation and those of states that have adopted California's standard, vehicle manufacturers are required to earn or purchase credits, referred to as ZEV credits, for compliance with their annual regulatory requirements. These laws provide that automakers may bank or sell to other regulated parties their excess credits if they earn more credits than the minimum quantity required by those laws. Tesla also earns other types of salable regulatory credits in the United States and abroad, including greenhouse gas, fuel economy and clean fuels credits. Likewise, several U.S. states have adopted procurement requirements for renewable energy production. These requirements enable companies deploying solar energy to earn tradable credits known as Solar Renewable Energy Certificates ("SRECs").

Regulation—Vehicle Safety and Testing

Our vehicles are subject to, and comply with or are otherwise exempt from, numerous regulatory requirements established by the National Highway Traffic Safety Administration ("NHTSA"), including all applicable United States Federal Motor Vehicle Safety Standards ("FMVSS"). Our vehicles fully comply with all applicable FMVSSs without the need for any exemptions, and we expect future Tesla vehicles to either fully comply or comply with limited exemptions related to new technologies. Additionally, there are regulatory changes being considered for several FMVSS, and while we anticipate compliance, there is no assurance until final regulation changes are enacted.

As a manufacturer, we must self-certify that our vehicles meet all applicable FMVSS, as well as the NHTSA bumper standard, or otherwise are exempt, before the vehicles can be imported or sold in the U.S. Numerous FMVSS apply to our vehicles, such as crash-worthiness requirements, crash avoidance requirements, and electric vehicle requirements. We are also required to comply with other federal laws administered by NHTSA, including the CAFE standards, Theft Prevention Act requirements, consumer information labeling requirements, Early Warning Reporting requirements regarding warranty claims, field reports, death and injury reports and foreign recalls, and owner's manual requirements.

The Automobile Information and Disclosure Act requires manufacturers of motor vehicles to disclose certain information regarding the manufacturer's suggested retail price, optional equipment and pricing. In addition, this law allows inclusion of city and highway fuel economy ratings, as determined by EPA, as well as crash test ratings as determined by NHTSA if such tests are conducted.

Our vehicles sold outside of the U.S. are subject to similar foreign safety, environmental and other regulations. Many of those regulations are different from those applicable in the U.S. and may require redesign and/or retesting. The European Union has established new rules regarding additional compliance oversight that are scheduled to commence in 2020, and there is also regulatory uncertainty related to the United Kingdom's impending withdrawal from the European Union. These changes could impact the rollout of new vehicle features in Europe.

Regulation – Self Driving

There are no federal U.S. regulations pertaining to the safety of self-driving vehicles; however, NHTSA has established recommended guidelines. Certain U.S. states have legal restrictions on self-driving vehicles, and many other states are considering them. This patchwork increases the legal complexity for our vehicles. In Europe, certain vehicle safety regulations apply to self-driving braking and steering systems, and certain treaties also restrict the legality of certain higher levels of self-driving vehicles. Self-driving laws and regulations are expected to continue to evolve in numerous jurisdictions in the U.S. and foreign countries, and may create restrictions on self-driving features that we develop.

Regulation—Battery Safety and Testing

Our battery pack conforms to mandatory regulations that govern transport of "dangerous goods," defined to include lithium-ion batteries, which may present a risk in transportation. The regulations vary by mode of shipping transportation, such as by ocean vessel, rail, truck, or air. We have completed the applicable transportation tests for our battery packs, demonstrating our compliance with applicable regulations.

We use lithium-ion cells in our high voltage battery packs. The use, storage, and disposal of our battery packs is regulated under federal law. We have agreements with third party battery recycling companies to recycle our battery packs.

Automobile Manufacturer and Dealer Regulation

State laws regulate the manufacture, distribution, and sale of automobiles, and generally require motor vehicle manufacturers and dealers to be licensed in order to sell vehicles directly to consumers in the state. As we open additional Tesla stores and service centers, we secure dealer licenses (or their equivalent) and engage in sales activities to sell our vehicles directly to consumers. A few states, such as Michigan and Connecticut, do not permit automobile manufacturers to be licensed as dealers or to act in the capacity of a dealer, or otherwise restrict a manufacturer's ability to deliver or service vehicles. To sell vehicles to residents of states where we are not licensed as a dealer, we generally conduct the sale out of the state via the Internet, phone or mail. In such states, we have opened "galleries" that

serve an educational purpose and are not sales locations.

As we expand our retail footprint in the U.S., some automobile dealer trade associations have both challenged the legality of our operations in court and used administrative and legislative processes to attempt to prohibit or limit our ability to operate existing stores or expand to new locations. We expect that the dealer associations will continue to mount challenges to our business model. In addition, we expect the dealer associations to actively lobby state licensing agencies and legislators to interpret existing laws or enact new laws in ways not favorable to Tesla's ownership and operation of its own retail and service locations, and we intend to actively fight any such efforts to limit our ability to sell our own vehicles.

Energy Storage

The regulatory regime for energy storage projects is still under development. Nevertheless, there are various policies, incentives and financial mechanisms at the federal, state and local levels that support the adoption of energy storage. For example, energy storage systems that are charged using solar energy are eligible for the 30% tax credit under Section 48(a)(3) of the Internal Revenue Code, or the IRC, as described below. In addition, California and a number of other states have adopted procurement targets for energy storage, and behind the meter energy storage systems qualify for funding under the California Self Generation Incentive Program.

The Federal Energy Regulatory Commission ("FERC") has also taken steps to enable the participation of energy storage in wholesale energy markets. In 2011 and 2013, FERC removed many barriers for systems like energy storage to provide frequency regulation service, thus increasing the value these systems can obtain in wholesale energy markets. More recently, in late 2016, FERC released a Notice of Proposed Rulemaking that, if it becomes a final rule, would further break down barriers preventing energy storage from fully participating in wholesale energy markets. Finally, in January 2017, FERC issued a statement supporting the use of energy storage as both electric transmission and as electric generation concurrently, thus enabling energy storage systems to provide greater value to the electric grid.

Solar Energy Systems

Government and Utility Programs and Incentives

U.S. federal, state and local governments have established various policies, incentives and financial mechanisms to reduce the cost of solar energy and to accelerate the adoption of solar energy. These incentives include tax credits, cash grants, tax abatements and rebates.

The federal government currently provides an uncapped investment tax credit ("ITC") under two sections of the IRC: Section 48 and Section 25D. Section 48(a)(3) of the IRC allows a taxpayer to claim a credit of 30% of qualified expenditures for a commercial solar energy system that commences construction by December 31, 2019. The credit then declines to 26% in 2020, 22% in 2021, and a permanent 10% thereafter. We claim the Section 48 commercial credit when available for both our residential and commercial projects, based on ownership of the solar energy system. The federal government also provides accelerated depreciation for eligible commercial solar energy systems. Section 25D of the IRC allows a homeowner-taxpayer to claim a credit of 30% of qualified expenditures for a residential solar energy system owned by the homeowner that is placed in service by December 31, 2019. The credit then declines to 26% in 2020 and 22% in 2021, and is scheduled to expire thereafter. Customers who purchase their solar energy systems for cash or through our solar loan offering are eligible to claim the Section 25D investment tax credit.

In addition to the federal ITC, many U.S. states offer personal and corporate tax credits and incentives for solar energy systems.

Regulation – General

We are not a "regulated utility" in the U.S. To operate our systems, we obtain interconnection agreements from the utilities. In most cases, interconnection agreements are standard form agreements that have been pre-approved by the public utility commission or other regulatory body.

Sales of electricity and non-sale equipment leases by third parties, such as our leases and PPAs, face regulatory challenges in some states and jurisdictions.

Regulation – Net Metering

Most states in the U.S. have a regulatory policy known as net energy metering, or net metering, available to solar customers. Net metering typically allows solar customers to interconnect their on-site solar energy systems to the utility grid and offset their utility electricity purchases by receiving a bill credit for excess energy generated by their solar energy system that is exported to the grid. In certain jurisdictions, regulators or utilities have reduced or eliminated the benefit available under net metering, or have proposed to do so.

Regulation – Mandated Renewable Capacity

Many states also have adopted procurement requirements for renewable energy production, such as an enforceable renewable portfolio standard, or RPS, or other policies that require covered entities to procure a specified percentage of total electricity delivered to customers in the state from eligible renewable energy sources, such as solar energy systems. In SREC state markets, the RPS requires electricity suppliers to secure a portion of their electricity from solar generators. The SREC program provides a means for SRECs to be created. A SREC represents the renewable energy associated with 1,000 kWhs of electricity produced from a solar energy system. When a solar energy system generates 1,000 kWhs of electricity, one SREC is issued by a government agency, which can then be sold separately from the energy produced to covered entities who surrender the SRECs to the state to prove compliance with the state's renewable energy mandate.

Competition

Vehicles

The worldwide automotive market is highly competitive and we expect it will become even more competitive in the future as we introduce additional vehicles in a broader cross-section of the passenger and commercial vehicle market.

We believe that our vehicles compete in the market both based on their traditional segment classification as well as based on their propulsion technology. For example, Model S and Model X compete primarily with premium sedans and premium SUVs and Model 3 competes with small to medium-sized sedans, which are extremely competitive markets with internal combustion vehicles from more established automobile manufacturers.

Moreover, many established and new automobile manufacturers have entered or have announced plans to enter the alternative fuel vehicle market. Overall, we believe these announcements and vehicle introductions promote the development of the alternative fuel vehicle market by highlighting the attractiveness of alternative fuel vehicles, particularly those fueled by electricity, relative to the internal combustion vehicle. Many major automobile manufacturers have electric vehicles available today, and other current and prospective automobile manufacturers are also developing electric vehicles. Electric vehicles have also already been brought to market in China and other foreign countries and we expect a number of those manufacturers to enter the U.S. market as well. In addition, several manufacturers offer hybrid vehicles, including plug-in versions.

Energy Storage

The market for energy storage products is also highly competitive. Established companies, such as AES Energy Storage, Siemens, LG Chem and Samsung, as well as various emerging companies, have introduced products that are similar to our product portfolio. There are several companies providing individual components of energy storage systems (such as cells, battery modules, and power electronics) as well as others providing integrated systems. We compete with these companies based on price, energy density and efficiency. We believe that the specifications of our products, our strong brand, and the modular, scalable nature of our Powerpack 2 product give us a competitive advantage when marketing our products.

Solar Energy Systems

The primary competitors to our solar energy business are the traditional local utility companies that supply energy to our potential customers. We compete with these traditional utility companies primarily based on price, predictability of price and the ease by which customers can switch to electricity generated by our solar energy systems. We also compete with solar energy companies that provide products and services similar to ours. Many solar energy

companies only install solar energy systems, while others only provide financing for these installations. In the residential solar energy system installation market, our primary competitors include Vivint Solar Inc., Sunrun Inc., Trinity Solar, SunPower Corporation, and many smaller local solar companies.

Intellectual Property

As part of our business, we seek to protect our intellectual property rights such as with respect to patents, trademarks, copyrights, trade secrets, including through employee and third party nondisclosure agreements, and other contractual arrangements. Additionally, we previously announced a patent policy in which we irrevocably pledged that we will not initiate a lawsuit against any party for infringing our patents through activity relating to electric vehicles or related equipment for so long as such party is acting in good faith. We made this pledge in order to encourage the advancement of a common, rapidly-evolving platform for electric vehicles, thereby benefiting ourselves, other companies making electric vehicles, and the world.

Segment Information

We operate as two reportable segments: automotive and energy generation and storage.

The automotive segment includes the design, development, manufacturing, sales, and leasing of electric vehicles as well as sales of automotive regulatory credits. Additionally, the automotive segment is also comprised of services and other, which includes non-warranty after-sales vehicle services, sales of used vehicles, sales of electric vehicle components and systems to other manufacturers, retail merchandise, and sales by our acquired subsidiaries to third party customers. The energy generation and storage segment includes the design, manufacture, installation, and sale or leasing of stationary energy storage products and solar energy systems, and sale of electricity generated by our solar energy systems to customers.

Employees

As of December 31, 2018, Tesla, Inc. had 48,817 full-time employees. To date, we have not experienced any work stoppages, and we consider our relationship with our employees to be good.

Available Information

We file or furnish periodic reports and amendments thereto, including our Annual Reports on Form 10-K, our Quarterly Reports on Form 10-Q and Current Reports on Form 8-K, proxy statements and other information with the Securities and Exchange Commission (“SEC”). In addition, the SEC maintains a website (www.sec.gov) that contains reports, proxy and information statements, and other information regarding issuers that file electronically. Our website is located at www.tesla.com, and our reports, amendments thereto, proxy statements and other information are also made available, free of charge, on our investor relations website at ir.tesla.com as soon as reasonably practicable after we electronically file or furnish such information with the SEC. The information posted on our website is not incorporated by reference into this Annual Report on Form 10-K.

ITEM 1A. RISK FACTORS

You should carefully consider the risks described below together with the other information set forth in this report, which could materially affect our business, financial condition and future results. The risks described below are not the only risks facing our company. Risks and uncertainties not currently known to us or that we currently deem to be immaterial also may materially adversely affect our business, financial condition and operating results.

Risks Related to Our Business and Industry

We have experienced in the past, and may experience in the future, delays or other complications in the design, manufacture, launch, production, delivery and servicing ramp of new vehicles and other products such as Model 3, Model Y, our energy storage products and Solar Roof, which could harm our brand, business, prospects, financial condition and operating results.

We have previously experienced launch, manufacturing, production and delivery ramp delays or other complications in connection with new vehicle models such as Model S, Model X and Model 3, new vehicle features such as the all-wheel drive dual motor drivetrain on Model S and the second version of Autopilot hardware, and a significant increase in automation introduced in the manufacture of Model 3. For example, we encountered unanticipated challenges, such as certain supply chain constraints, that led to initial delays in producing Model X. Similarly, we experienced certain challenges in the production of Model 3 that led to delays in its ramp. Moreover, in the areas of Model 3 production where we had challenges ramping fully automated processes, such as portions of the battery module assembly line, material flow system and the general assembly line, we reduced the levels of automation and introduced semi-automated or manual processes. If issues like these arise or recur, if our remediation measures and process changes do not continue to be successful, if we experience issues with transitioning to full automation in certain production lines or to other planned manufacturing improvements, or if we experience issues or delays in building our Gigafactory Shanghai in China or commencing and ramping Model 3 production there, we could experience issues in sustaining the Model 3 ramp or delays in increasing Model 3 production further. Also, if we encounter difficulties in scaling our delivery or servicing capabilities for Model 3 or future vehicles and products to high volumes in the U.S. or internationally, our financial condition and operating results could suffer. In addition, because our vehicle models share certain production facilities with other vehicle models, the volume or efficiency of production with respect to one model may impact the production of other models or lead to bottlenecks that impact the production of all models.

We may also experience similar future delays or other complications in bringing to market and ramping production of new vehicles, such as Model Y, the Tesla Semi, our planned pickup truck and new Tesla Roadster, our energy storage products and Solar Roof. Any significant additional delay or other complication in the production of and delivery capabilities for our current products or the development, manufacture, launch, production and delivery and servicing capability ramp of our future products, including complications associated with expanding our production capacity, supply chain and delivery systems or obtaining or maintaining regulatory approvals, could materially damage our brand, business, prospects, financial condition and operating results.

We have experienced in the past, and may experience in the future, delays in realizing our projected timelines and cost and volume targets for the production and ramp of Model 3, which could harm our business, prospects, financial condition and operating results.

Our future business depends in large part on our ability to execute on our plans to manufacture, market and sell the Model 3 vehicle, which we are offering at a lower price point and which we are producing at significantly higher volumes than the Model S or Model X vehicles. We commenced production and initial customer deliveries of Model 3 in July 2017, and since then have achieved a stabilized production rate. At the Tesla Factory, we expect to continue to increase our Model 3 production rate to approximately 7,000 units per week on a sustained basis by the end of 2019.

Moreover, in China, we expect to commence production of certain trims of Model 3 for the local market in China in the initial phase of our Gigafactory Shanghai by the end of 2019, and then progressively increase levels of localization through local sourcing and manufacturing. Inclusive of Gigafactory Shanghai, our goal is to be able to produce 10,000 Model 3 vehicles per week on a sustained basis, and an annualized output rate in excess of 500,000 Model 3 vehicles sometime between the fourth quarter of 2019 and the second quarter of 2020. However, the timeframe for commencing Model 3 production at Gigafactory Shanghai is subject to a number of uncertainties, including regulatory approval, supply chain constraints, and the pace of installing production equipment and bringing the factory online.

We have limited experience to date in manufacturing vehicles at the high volumes that we recently achieved and to which we anticipate ramping further for Model 3, and to be successful, we will need to complete the implementation and ramp of efficient and cost-effective manufacturing capabilities, processes and supply chains necessary to support such volumes, including at Gigafactory Shanghai. We are employing a higher degree of automation in the manufacturing processes for Model 3 than we have previously employed and to continue to implement additional automation. In some cases, we have temporarily reduced the levels of automation and introduced semi-automated or manual processes, at additional labor cost. Additional bottlenecks may also arise as we continue to ramp production at the Tesla Factory and commence the initial phase of Model 3 production at Gigafactory Shanghai, and it will be important that we address them promptly and in a cost-effective manner. Moreover, our Model 3 production plan has generally required to date significant investments of cash and management resources, and we expect to deploy some level of additional resources as we further progress our ramp and begin production in new locations in the future, such as China.

Our production plan for Model 3 is based on many key assumptions, including:

- that we will be able to sustain and further expand our high-volume production of Model 3 at the Tesla Factory without exceeding our projected costs and on our projected timeline;
- that we will be able to continue to expand Gigafactory 1 in a timely manner to produce high volumes of quality lithium-ion cells to be integrated into battery modules and finished battery packs and drive unit components for Model 3, including in part to support production in China as the level of local sourcing and manufacturing there progressively increases, all at costs that allow us to sell Model 3 at our target gross margins;
- that we will be able to build and commence production at additional future facilities, such as at Gigafactory Shanghai, to support our international ramp for Model 3 in accordance with our projected costs and timeline;
    - that the equipment and processes which we have selected for Model 3 production will be able to accurately manufacture high volumes of Model 3 vehicles within specified design tolerances and with high quality;
- that we will be able to maintain suppliers for the necessary components on terms and conditions that are acceptable to us and that we will be able to obtain high-quality components on a timely basis and in the necessary quantities to support high-volume production; and
- that we will be able to attract, recruit, hire, train and retain skilled employees to operate our planned high-volume production facilities to support Model 3, including at the Tesla Factory, Gigafactory 1 and Gigafactory Shanghai.

If one or more of the foregoing assumptions turns out to be incorrect, our ability to meet our Model 3 projections on time and at volumes and prices that are profitable, the demand for and deliveries of Model 3, as well as our business, prospects, operating results and financial condition, may be materially and adversely impacted.

We may be unable to meet our growing vehicle production, sales and delivery plans and servicing needs, any of which could harm our business and prospects.

Our plans call for sustaining and further ramping from our significant increases in vehicle production and deliveries, particularly for Model 3. Our ability to achieve these plans will depend upon a number of factors, including our ability to utilize installed manufacturing capacity to achieve the planned production yield, further install and increase capacity in accordance with our planned timelines and costs, maintain our desired quality levels and optimize design and production changes, as well as our suppliers' ability to support our needs. In addition, we have used and may use in the future a number of new manufacturing technologies, techniques and processes for our vehicles, which we must successfully introduce and scale for high-volume production. For example, we have introduced highly automated production lines, aluminum spot welding systems and high-speed blow forming of certain difficult to stamp vehicle parts. We have also introduced unique design features in our vehicles with different manufacturing challenges, such as large display screens, dual motor drivetrain, Autopilot hardware and falcon-wing doors. We have limited experience developing, manufacturing, selling and servicing, and allocating our available resources among, multiple products simultaneously. If we are unable to realize our plans, our brand, business, prospects, financial condition and operating

results could be materially damaged.

Concurrent with our increasing vehicle production levels, we will also need to continue to significantly increase sales and deliveries of our vehicles. Although we have a plan for selling and delivering increased volumes of vehicles, we have limited experience in marketing, selling and delivering vehicles at the higher volumes at which we are manufacturing Model 3, and we may face difficulties meeting our sales and delivery goals in both existing markets as well as new markets into which we expand, such as Europe and China where we are beginning to deliver Model 3 for the first time in the first quarter of 2019. In particular, we are targeting for the first time with Model 3 a mass demographic with a broad range of potential customers, in which we have limited experience projecting demand and pricing our products. While we are producing numerous variants (including regional versions) of Model 3 in accordance with the demand that we expect for them, if our projections are inaccurate, we may not be able to generate sales matched to the specific vehicles that we have the capacity to produce, based on vehicle production line constraints and long lead times for procuring certain parts.

Moreover, because we do not have independent dealer networks, we are responsible for delivering all of our vehicles to our customers and meeting their vehicle servicing needs. To date, we have limited experience with such deliveries and servicing at the scale to which we expect to grow, particularly in international markets. To accommodate our volumes, we have deployed a number of delivery models, such as deliveries to customers' homes and workplaces, some of which have not been previously tested at scale and in different geographies. Moreover, significant transit time may be required to transport vehicles such as Model 3 in volume into new markets for the first time. To the extent that such factors lead to delays in our deliveries, our results may be negatively impacted. Finally, because of our unique expertise with our vehicles, we recommend that our vehicles be serviced by our service centers, Mobile Service technicians or certain authorized professionals that we have specifically trained and equipped. If we experience delays in adding such servicing capacity or experience unforeseen issues with the reliability of Model 3, which we recently commenced producing at volume, it could overburden our servicing capabilities. If we are unable to ramp up to meet our sales, delivery and servicing targets globally, or our projections on which such targets are based are inaccurate, this could result in negative publicity and damage to our brand and have a material adverse effect on our business, prospects, financial condition and operating results.

Our future growth and success is dependent upon consumers' willingness to adopt electric vehicles and specifically our vehicles, especially in the mass market demographic which we are targeting with Model 3.

Our growth is highly dependent upon the adoption by consumers of alternative fuel vehicles in general and electric vehicles in particular. Although we have successfully grown demand for our vehicles thus far, there is no guarantee of such future demand, or that our vehicles will not compete with one another in the market. Moreover, the Model 3 mass market demographic is larger, but more competitive, than the demographic for Model S and Model X, and additional electric vehicles are entering the market.

If the market for electric vehicles in general and Tesla vehicles in particular does not develop as we expect, or develops more slowly than we expect, or if demand for our vehicles decreases in our markets, our business, prospects, financial condition and operating results could be harmed. We have only recently begun high volume production of vehicles, are still at an earlier stage and have limited resources relative to our competitors, and the market for alternative fuel vehicles is rapidly evolving. As a result, the market for our vehicles could be affected by numerous factors, such as:

- perceptions about electric vehicle features, quality, safety, performance and cost;
- perceptions about the limited range over which electric vehicles may be driven on a single battery charge;
- competition, including from other types of alternative fuel vehicles, plug-in hybrid electric vehicles and high fuel-economy internal combustion engine vehicles;
- volatility in the cost of oil and gasoline;
- government regulations and economic incentives;

- access to charging facilities; and
- concerns about our future viability.

We are dependent on our suppliers, the majority of which are single-source suppliers, and the inability of these suppliers to deliver necessary components of our products according to our schedule and at prices, quality levels and volumes acceptable to us, or our inability to efficiently manage these components, could have a material adverse effect on our financial condition and operating results.

Our products contain numerous purchased parts which we source globally from hundreds of direct suppliers, the majority of whom are currently single-source suppliers, although we attempt to qualify and obtain components from multiple sources whenever feasible. Any significant increases in our production may require us to procure additional components in a short amount of time, and in the past we have also replaced certain suppliers because of their failure to provide components that met our quality control standards. While we believe that we will be able to secure additional or alternate sources of supply for most of our components in a relatively short time frame, there is no assurance that we will be able to do so or develop our own replacements for certain highly customized components of our products. Moreover, we have signed long-term agreements with Panasonic to be our manufacturing partner and supplier for lithium-ion cells at Gigafactory 1 in Nevada and PV cells and panels at Gigafactory 2 in Buffalo, New York. If we encounter unexpected difficulties with key suppliers such as Panasonic, and if we are unable to fill these needs from other suppliers, we could experience production delays and potential loss of access to important technology and parts for producing, servicing and supporting our products.

This limited, and in many cases single source, supply chain exposes us to multiple potential sources of delivery failure or component shortages for the production of our products, such as those which we experienced in 2012 and 2016 in connection with our slower-than-planned Model S and Model X ramps. Furthermore, unexpected changes in business conditions, materials pricing, labor issues, wars, governmental changes, natural disasters such as the March 2011 earthquakes in Japan and other factors beyond our and our suppliers' control, could also affect our suppliers' ability to deliver components to us on a timely basis. The loss of any single or limited source supplier or the disruption in the supply of components from these suppliers could lead to product design changes and delays in product deliveries to our customers, which could hurt our relationships with our customers and result in negative publicity, damage to our brand and a material and adverse effect on our business, prospects, financial condition and operating results.

Changes in our supply chain have also resulted in the past, and may result in the future, in increased cost. We have also experienced cost increases from certain of our suppliers in order to meet our quality targets and development timelines as well as due to our design changes, and we may experience similar cost increases in the future. Certain suppliers have sought to renegotiate the terms of supply arrangements. Additionally, we are negotiating with existing suppliers for cost reductions, seeking new and less expensive suppliers for certain parts, and attempting to redesign certain parts to make them less expensive to produce. If we are unsuccessful in our efforts to control and reduce supplier costs, our operating results will suffer.

In particular, because we are producing Model 3 at significantly higher volumes than any of our other products to date, the negative impact of any delays or other constraints with respect to our suppliers for Model 3 could be substantially greater than any supply chain-related issues experienced with respect to our other products. We need our Model 3 suppliers to sustainably ramp in accordance with our ongoing ramp of Model 3 and deliver according to our schedule. There is no assurance that these suppliers will ultimately be able to sustainably and timely meet our cost, quality and volume needs. For example, we may experience issues or delays increasing the level of localization in China through local sourcing and manufacturing at our Gigafactory Shanghai. Furthermore, as the scale of our vehicle production increases, we will need to accurately forecast, purchase, warehouse and transport to our manufacturing facilities components at much higher volumes. If we are unable to accurately match the timing and quantities of component purchases to our actual needs, or successfully implement automation, inventory management and other systems to accommodate the increased complexity in our supply chain, we may incur unexpected production disruption, storage, transportation and write-off costs, which could have a material adverse effect on our financial condition and operating results.

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Future problems or delays in expanding Gigafactory 1 or ramping operations there could negatively affect the production and profitability of our products, such as Model 3 and our energy storage products.

To lower the cost of cell production and produce cells in high volume, we have vertically integrated the production of lithium-ion cells and finished battery packs for Model 3 and energy storage products at Gigafactory 1. While Gigafactory 1 began producing lithium-ion cells for energy storage products in January 2017 and has since begun producing lithium-ion cells for Model 3, we have no other direct experience in the production of lithium-ion cells. Given the size and complexity of this undertaking, it is possible that future events could result in issues or delays in further ramping and expanding production at Gigafactory 1. Moreover, we expect that we will need additional production at Gigafactory 1 to support vehicle production at Gigafactory Shanghai in part when we commence Model 3 production there. In order to achieve our volume and gross margin targets for Model 3 and the anticipated ramp in production of energy storage products, we must continue to sustain and ramp significant cell production at Gigafactory 1, which, among other things, requires Panasonic to successfully operate and further ramp its cell production lines at significant volumes. Although Panasonic has a long track record of producing high-quality cells at significant volume at its factories in Japan, it has limited experience with cell production at Gigafactory 1. In addition, we produce several components for Model 3, such as battery modules incorporating the lithium-ion cells produced by Panasonic, and drive units, at Gigafactory 1. Some of the manufacturing lines for such components took longer than anticipated to ramp to their full capacity. While we have largely overcome this bottleneck after deploying multiple semi-automated lines and improving our original lines, additional bottlenecks may arise as we continue to increase the production rate. Finally, we have announced that we will likely manufacture Model Y at Gigafactory 1. If we are unable to maintain Gigafactory 1 production, ramp additionally over time as needed, and do so cost-effectively, or if we or Panasonic are unable to attract, hire and retain a substantial number of highly skilled personnel, our ability to supply battery packs or other components for Model 3 and our other products could be negatively impacted, which could negatively affect our brand and harm our business, prospects, financial condition and operating results.

If our vehicles or other products that we sell or install fail to perform as expected, our ability to develop, market and sell our products and services could be harmed.

If our vehicles or our energy products contain defects in design and manufacture that cause them not to perform as expected or that require repair, or certain features of our vehicles, such as full self-driving, take longer than expected to become enabled or are legally restricted, our ability to develop, market and sell our products and services could be harmed. For example, the operation of our vehicles is highly dependent on software, which is inherently complex and may contain latent defects and errors or be subject to external attacks. Issues experienced by vehicle customers have included those related to the software for the 17 inch display screen, the panoramic roof and the 12-volt battery in the Model S and the seats and doors in the Model X. Although we attempt to remedy any issues we observe in our products as effectively and rapidly as possible, such efforts may not be timely, may hamper production or may not be to the satisfaction of our customers. While we have performed extensive internal testing on the products we manufacture, we currently have a limited frame of reference by which to evaluate detailed long-term quality, reliability, durability and performance characteristics of our battery packs, powertrains, vehicles and energy storage products. There can be no assurance that we will be able to detect and fix any defects in our products prior to their sale to or installation for consumers.

Any product defects, delays or legal restrictions on product features, or other failure of our products to perform as expected, could harm our reputation and result in delivery delays, product recalls, product liability claims, and significant warranty and other expenses, and could have a material adverse impact on our business, financial condition, operating results and prospects.

If we fail to scale our business operations and otherwise manage future growth and adapt to new conditions effectively as we rapidly grow our company, including internationally, we may not be able to produce, market, sell and service our products successfully.

Any failure to manage our growth effectively could materially and adversely affect our business, prospects, operating results and financial condition. We expect to continue to expand our operations significantly, including internationally and with our increasing production of Model 3, and the worldwide sales, delivery and servicing of a significantly higher number of vehicles than our current vehicle fleet in the coming years. Furthermore, we are developing and growing our energy storage product and solar business worldwide, including in countries where we have limited or no previous operating experience. Our future operating results depend to a large extent on our ability to manage our expansion and growth successfully. We may not be successful in undertaking this global expansion if we are unable to control expenses and avoid cost overruns and other unexpected operating costs, establish sufficient worldwide automobile sales, delivery, service and Supercharger facilities in a timely manner, adapt our products and conduct our operations to meet local requirements, implement required local infrastructure, systems and processes, and find and hire a significant number of additional manufacturing, engineering, service, electrical installation, construction and administrative personnel.

In particular, we plan to expand our manufacturing capabilities outside of the U.S., where we have limited experience operating a factory or managing related regulatory, financing and other challenges. For example, as part of our continuing work to increase Model 3 production to 10,000 vehicles per week on a sustained basis and make Model 3 affordable in the markets where we plan to offer it, we expect to commence the initial phase of Model 3 production at Gigafactory Shanghai for the local market in China by the end of 2019, although the timeframe for that is subject to a number of uncertainties, including regulatory approval, supply chain constraints, and the pace of installing production equipment and bringing the factory online. As we expect to commence our manufacturing activities in China using progressively increased levels of localization through local sourcing and manufacturing, we expect that we will need to initially support manufacturing activities there with production processes at our existing manufacturing facilities, such as Gigafactory 1. Moreover, local manufacturing is critical to our expansion and sales in China, which is the largest market for electric vehicles in the world. Our sales of Model S and Model X in China have been negatively impacted by certain tariffs on automobiles manufactured in the U.S., such as our vehicles, and our costs for producing our vehicles in the U.S. have also been affected by import duties on certain components sourced from China. If we are not able to establish manufacturing activities in China and other jurisdictions to minimize the impact of such unfavorable tariffs, duties or costs, or ramp our production capabilities at Gigafactory 1 or other facilities to support such vehicle manufacturing activities, our ability to compete in such jurisdictions, and our operating results, business and prospects, will be harmed.

If we are unable to achieve our targeted manufacturing costs for our vehicles, including Model 3, our financial condition and operating results will suffer.

While we are continuing to and expect in the future to realize cost reductions by both us and our suppliers, there is no guarantee we will be able to achieve sufficient cost savings to reach our gross margin and profitability goals, including for the least expensive variant of Model 3 that we ultimately expect to produce, or our other financial targets. We incur significant costs related to procuring the materials required to manufacture our vehicles, assembling vehicles and compensating our personnel. If our efforts to continue to decrease manufacturing costs are not successful, we may incur substantial costs or cost overruns in utilizing and increasing the production capability of our vehicle manufacturing facilities, such as for Model 3 both in the U.S. and internationally. Many of the factors that impact our manufacturing costs are beyond our control, such as potential increases in the costs of our materials and components, such as lithium, nickel and other components of our battery cells or aluminum used to produce body panels. If we are unable to continue to control and reduce our manufacturing costs, our operating results, business and prospects will be harmed.

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Increases in costs, disruption of supply or shortage of materials, in particular for lithium-ion cells, could harm our business.

We may experience increases in the cost or a sustained interruption in the supply or shortage of materials. Any such increase, supply interruption or shortage could materially and negatively impact our business, prospects, financial condition and operating results. We use various materials in our business including aluminum, steel, lithium, nickel, copper and cobalt, as well as lithium-ion cells from suppliers. The prices for these materials fluctuate, and their available supply may be unstable, depending on market conditions and global demand for these materials, including as a result of increased production of electric vehicles and energy storage products by our competitors, and could adversely affect our business and operating results. For instance, we are exposed to multiple risks relating to lithium-ion cells. These risks include:

- an increase in the cost, or decrease in the available supply, of materials used in the cells;
- disruption in the supply of cells due to quality issues or recalls by battery cell manufacturers or any issues that may arise with respect to cells manufactured at our own facilities; and
- fluctuations in the value of the Japanese yen against the U.S. dollar as our battery-cell purchases for Model S and Model X and some raw materials for cells used in Model 3 and energy storage products are currently denominated in Japanese yen.

Our business is dependent on the continued supply of battery cells for the battery packs used in our vehicles and energy storage products. While we believe several sources of the battery cells are available for such battery packs, and expect to eventually rely substantially on battery cells manufactured at our own facilities, we have to date fully qualified only a very limited number of suppliers for the cells used in such battery packs and have very limited flexibility in changing cell suppliers. Any disruption in the supply of battery cells from such suppliers could disrupt production of our vehicles and of the battery packs we produce for energy products until such time as a different supplier is fully qualified. Furthermore, fluctuations or shortages in petroleum and other economic conditions may cause us to experience significant increases in freight charges and material costs. Substantial increases in the prices for our materials or prices charged to us, such as those charged by battery cell suppliers, would increase our operating costs, and could reduce our margins if we cannot recoup the increased costs through increased vehicle prices. Any attempts to increase vehicle prices in response to increased material costs could result in cancellations of vehicle orders and reservations and therefore materially and adversely affect our brand, image, business, prospects and operating results.

We may become subject to product liability claims, which could harm our financial condition and liquidity if we are not able to successfully defend or insure against such claims.

Although we design our vehicles to be the safest vehicles on the road, product liability claims, even those without merit, could harm our business, prospects, operating results and financial condition. The automobile industry in particular experiences significant product liability claims and we face inherent risk of exposure to claims in the event our vehicles do not perform or are claimed to not have performed as expected. As is true for other automakers, our cars have been involved and we expect in the future will be involved in crashes resulting in death or personal injury, and such crashes where Autopilot is engaged are the subject of significant public attention. We have experienced and we expect to continue to face claims arising from or related to misuse or claimed failures of new technologies that we are pioneering, including Autopilot in our vehicles. Moreover, as our solar energy systems and energy storage products generate and store electricity, they have the potential to cause injury to people or property. A successful product liability claim against us could require us to pay a substantial monetary award. Our risks in this area are particularly pronounced given the relatively limited number of vehicles and energy storage products delivered to date and limited field experience of our products. Moreover, a product liability claim could generate substantial negative publicity about our products and business and could have a material adverse effect on our brand, business, prospects and operating results. In most jurisdictions, we generally self-insure against the risk of product liability claims for

vehicle exposure, meaning that any product liability claims will likely have to be paid from company funds, not by insurance.

The markets in which we operate are highly competitive, and we may not be successful in competing in these industries. We currently face competition from new and established domestic and international competitors and expect to face competition from others in the future, including competition from companies with new technology.

The worldwide automotive market, particularly for alternative fuel vehicles, is highly competitive today and we expect it will become even more so in the future. There is no assurance that our vehicles will be successful in the respective markets in which they compete. A significant and growing number of established and new automobile manufacturers, as well as other companies, have entered or are reported to have plans to enter the alternative fuel vehicle market, including hybrid, plug-in hybrid and fully electric vehicles, as well as the market for self-driving technology and applications. In some cases, such competitors have announced an intention to produce electric vehicles exclusively at some point in the future. Most of our current and potential competitors have significantly greater financial, technical, manufacturing, marketing, vehicle sales resources and networks than we do and may be able to devote greater resources to the design, development, manufacturing, distribution, promotion, sale and support of their products. In particular, some competitors have also announced plans to compete with us in important and large markets for electric vehicles, such as China. Increased competition could result in lower vehicle unit sales, price reductions, revenue shortfalls, loss of customers and loss of market share, which could harm our business, prospects, financial condition and operating results. In addition, our Model 3 vehicle faces competition from existing and future automobile manufacturers in the extremely competitive entry-level premium sedan market, including Audi, BMW, Lexus and Mercedes.

The solar and energy storage industries are highly competitive. We face competition from other manufacturers, developers and installers of solar and energy storage systems, as well as from large utilities. Decreases in the retail prices of electricity from utilities or other renewable energy sources could make our products less attractive to customers and lead to an increased rate of customer defaults under our existing long-term leases and PPAs. Moreover, solar panel and lithium-ion battery prices have declined and are continuing to decline. As we increase our battery and solar manufacturing capabilities, including at Gigafactory 1 and Gigafactory 2, future price declines may harm our ability to produce energy storage systems and solar systems at competitive prices.

If we are unable to establish and maintain confidence in our long-term business prospects among consumers, analysts and within our industries, then our financial condition, operating results, business prospects and stock price may suffer materially.

Consumers may be less likely to purchase our products if they are not convinced that our business will succeed or that our service and support and other operations will continue in the long term. Similarly, suppliers and other third parties will be less likely to invest time and resources in developing business relationships with us if they are not convinced that our business will succeed. Accordingly, in order to build and maintain our business, we must maintain confidence among customers, suppliers, analysts, ratings agencies and other parties in our long-term financial viability and business prospects. Maintaining such confidence may be particularly complicated by certain factors, such as our limited operating history, negative press, customer unfamiliarity with our products, any delays in scaling manufacturing, delivery and service operations to meet demand, competition and uncertainty regarding the future of electric vehicles or our other products and services, our quarterly production and sales performance compared with market expectations, and any other negative publicity related to us. Many of these factors are largely outside our control, and any negative perceptions about our long-term business prospects, even if exaggerated or unfounded, such as speculation regarding the sufficiency or stability of our management team, could harm our business and make it more difficult to raise additional funds if needed.

Our plan to generate ongoing growth and demand, including by expanding and optimizing our retail, service and vehicle charging operations, will require significant cash investments and management resources and may not meet expectations with respect to additional sales, installations or servicing of our products or availability of public charging solutions.

We plan to generate ongoing growth and demand, including by globally expanding and optimizing our retail, service and vehicle charging operations. These plans require significant cash investments and management resources and may not meet our expectations with respect to additional sales or installations of our products. This ongoing global expansion, which includes planned entry into markets in which we have limited or no experience selling, delivering, installing and/or servicing our products at scale, and which may pose legal, regulatory, labor, cultural and political challenges that we have not previously encountered, may not have the desired effect of increasing sales and installations and expanding our brand presence to the degree we are anticipating. Furthermore, the increasing number of Tesla vehicles will require us to continue to increase the number of our Supercharger stations and connectors significantly in locations throughout the world. If we fail to do so in a timely manner, our customers could become dissatisfied, which could adversely affect sales of our vehicles. We will also need to ensure we are in compliance with any regulatory requirements applicable to the sale, installation and service of our products, the sale of electricity generated through our solar energy systems and operation of Superchargers in those jurisdictions, which could take considerable time and expense. If we experience any delays or cannot meet customer expectations in expanding our customer infrastructure network, or our expansion plans are not successful in continuing to grow demand, this could lead to a decrease or stagnation in sales or installations of our products and could negatively impact our business, prospects, financial condition and operating results.

We face risks associated with our global operations and expansion, including unfavorable regulatory, political, economic, tax and labor conditions, and with establishing ourselves in new markets, all of which could harm our business.

We currently have a global footprint, with domestic and international operations and subsidiaries in various countries and jurisdictions, and we continue to expand and optimize our retail, service and Supercharger capabilities internationally. Accordingly, we are subject to a variety of legal, political and regulatory requirements and social and economic conditions over which we have little control. For example, we may be impacted by trade policies, political uncertainty and economic cycles involving geographic regions where we have significant operations. Sales of vehicles in the automotive industry also tend to be cyclical in many markets, which may expose us to increased volatility as we expand and adjust our operations and retail strategies.

We are subject to a number of risks associated in particular with international business activities that may increase our costs, impact our ability to sell our products and require significant management attention. These risks include conforming our products to various international regulatory and safety requirements as well as charging and other electric infrastructures, organizing local operating entities, difficulty in establishing, staffing and managing foreign operations, challenges in attracting customers, foreign government taxes, regulations and permit requirements, our ability to enforce our contractual rights; trade restrictions, customs regulations, tariffs and price or exchange controls, and preferences of foreign nations for domestically manufactured products. For example, in China, which is a key market for us, certain products such as automobiles manufactured in the U.S. have become subject to a recently increased tariff imposed by the government. While such increase has been temporarily suspended, the tariff could remain in place for an undetermined length of time, be further increased in the future and/or lead consumers to postpone or choose another vehicle brand subject to lower tariffs or no tariffs. Moreover, recently increased import duties on certain components used in our products that are sourced from China may increase our costs and negatively impact our operating results.

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Our vehicles and energy storage products make use of lithium-ion battery cells, which have been observed to catch fire or vent smoke and flame, and such events have raised concerns, and future events may lead to additional concerns, about the batteries used in automotive applications.

The battery packs that we produce make use of lithium-ion cells. On rare occasions, lithium-ion cells can rapidly release the energy they contain by venting smoke and flames in a manner that can ignite nearby materials as well as other lithium-ion cells. While we have designed the battery pack to passively contain any single cell's release of energy without spreading to neighboring cells, there can be no assurance that a field or testing failure of our vehicles or other battery packs that we produce will not occur, which could subject us to lawsuits, product recalls or redesign efforts, all of which would be time consuming and expensive. Also, negative public perceptions regarding the suitability of lithium-ion cells for automotive applications or any future incident involving lithium-ion cells such as a vehicle or other fire, even if such incident does not involve our vehicles or energy storage products, could seriously harm our business.

In addition, we store a significant number of lithium-ion cells at our facilities and are producing high volumes of cells and battery modules and packs at Gigafactory 1. Any mishandling of battery cells may cause disruption to the operation of our facilities. While we have implemented safety procedures related to the handling of the cells, there can be no assurance that a safety issue or fire related to the cells would not disrupt our operations. Such damage or injury could lead to adverse publicity and potentially a safety recall. Moreover, any failure of a competitor's electric vehicle or energy storage product may cause indirect adverse publicity for us and our products. Such adverse publicity could negatively affect our brand and harm our business, prospects, financial condition and operating results.

If we fail to effectively grow and manage the residual, financing and credit risks related to our vehicle financing programs, our business may suffer.

We offer financing arrangements for our vehicles in North America, Europe and Asia primarily through various financial institutions. We also currently offer Model S and Model X leasing directly through our local subsidiaries in the U.S. and Canada. Under a lease held directly by us, we typically receive only a very small portion of the total vehicle purchase price at the time of lease, followed by a stream of payments over the term of the lease. The profitability of any vehicles returned to us at the end of their leases depends on our ability to accurately project our vehicles' residual values at the outset of the leases, and such values may fluctuate prior to the end of their terms depending on various factors such as supply and demand of our used vehicles, economic cycles and the pricing of new vehicles. The leasing program also relies on our ability to secure adequate financing and/or business partners to fund and grow this program, and screen for and manage customer credit risk. We expect the availability of leasing and other financing options will be important for our vehicle customers. If we are unable to adequately fund our leasing program with internal funds, or partners or other external financing sources, and compelling alternative financing programs are not available for our customers, we may be unable to grow our sales. Furthermore, if our leasing business grows substantially, our business may suffer if we cannot effectively manage the greater levels of residual and credit risks resulting from growth. Finally, if we do not successfully monitor and comply with applicable national, state and/or local financial regulations and consumer protection laws governing lease transactions, we may become subject to enforcement actions or penalties, either of which may harm our business.

Moreover, we have provided resale value guarantees to customers and partners for certain financing programs, under which such counterparties may sell their vehicles back to us at certain points in time at pre-determined amounts. However, actual resale values, as with residual values for leased vehicles, are subject to similar fluctuations over the term of the financing arrangements. If the actual resale values of any vehicles resold or returned to us pursuant to these programs are materially lower than the pre-determined amounts we have offered, our operating results, profitability and/or liquidity could be negatively impacted.

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The unavailability, reduction or elimination of, or unfavorable determinations with respect to, government and economic incentives in the U.S. and abroad supporting the development and adoption of electric vehicles, energy storage products or solar energy could have some impact on demand for our products and services.

We and our customers currently benefit from certain government and economic incentives supporting the development and adoption of electric vehicles. In the U.S. and abroad, such incentives include, among other things, tax credits or rebates that encourage the purchase of electric vehicles. In Norway, for example, the purchase of electric vehicles is not currently subject to import taxes, the 25% value added tax, or the carbon dioxide and weight-based purchase taxes that apply to the purchase of gas-powered vehicles. Notably, the quantum of incentive programs promoting electric vehicles is a tiny fraction of the amount of subsidies that are provided to gas-powered vehicles through the oil and gas industries. Nevertheless, even the limited benefits from such programs could be reduced, eliminated or exhausted. For example, under current regulations, a $7,500 federal tax credit that was available in the U.S. for the purchase of our vehicles is being reduced in phases during, and will sunset at the end of, 2019. We believe the first reduction in this tax credit may have pulled forward some near-term demand in the U.S. into 2018, and could create similar pull-forwards in 2019 before each further step reduction in the federal tax credit. Moreover, in July 2018, a previously available incentive for purchases of Model 3 in Ontario, Canada was cancelled and Tesla buyers in Germany lost access to electric vehicle incentives for a short period of time beginning late 2017. In April 2017 and January 2016, respectively, previously available incentives in Hong Kong and Denmark that favored the purchase of electric vehicles expired, negatively impacting sales. Effective March 2016, California implemented regulations phasing out a $2,500 cash rebate on qualified electric vehicles for high-income consumers. Such developments could have some negative impact on demand for our vehicles, and we and our customers may have to adjust to them.

In addition, certain governmental rebates, tax credits and other financial incentives that are currently available with respect to our solar and energy storage product businesses allow us to lower our installation costs and cost of capital and encourage customers to buy our products and investors to invest in our solar financing funds. However, these incentives may expire on a particular date when the allocated funding is exhausted, reduced or terminated as renewable energy adoption rates increase, often without warning. For example, the U.S. federal government currently offers a 30% ITC for the installation of solar power facilities and energy storage systems that are charged from a co-sited solar power facility. The ITC is currently scheduled to decline in phases, ultimately to 10% for commercial and utility systems and to 0% for customer-owned residential systems by January 2022. Likewise, in jurisdictions where net energy metering is currently available, our customers receive bill credits from utilities for energy that their solar energy systems generate and export to the grid in excess of the electric load they use. Several jurisdictions have reduced or eliminated the benefit available under net energy metering, or have proposed to do so. Such reductions in or termination of governmental incentives could adversely impact our results by making our products less competitive for potential customers, increasing our cost of capital and adversely impacting our ability to attract investment partners and to form new financing funds for our solar and energy storage assets. Additionally, the enactment of the Tax Cuts and Jobs Act in the U.S. could potentially increase the cost, and decrease the availability, of renewable energy financing, by reducing the value of depreciation benefits associated with, and the overall investor tax capacity needed to monetize, renewable energy projects. Such changes could lower the overall investment willingness and capacity for such projects available in the market.

Moreover, we and our fund investors claim the ITC and certain state incentives in amounts based on the fair market value of our solar and energy storage systems. Although we obtain independent appraisals to support the claimed fair market values, the relevant governmental authorities have audited such values and in certain cases have determined that they should be lower, and they may do so again in the future. Such determinations may result in adverse tax consequences and/or our obligation to make indemnification or other payments to our funds or fund investors.

Any failure by us to realize the expected benefits of our substantial investments and commitments with respect to the manufacture of PV cells and modules, including if we are unable to comply with the terms of our agreement with the Research Foundation for the State University of New York relating to our Gigafactory 2, could result in negative consequences for our business.

We own certain PV cell and module manufacturing and technology assets, and a build-to-suit lease arrangement with the Research Foundation for the State University of New York (the "SUNY Foundation"). This agreement with the SUNY Foundation provides for the construction of Gigafactory 2 in Buffalo, New York with the intended capacity to produce at least 1.0 GW of solar products annually. Under this agreement, we are obligated to, among other things, employ specified minimum numbers of personnel in the State of New York and spend or incur $5.0 billion in combined capital, operational expenses, costs of goods sold and other costs in the State of New York during the 10-year period following the completion of all construction and related infrastructure, the arrival of manufacturing equipment, and the receipt of certain permits and other specified items at Gigafactory 2. If we fail in any year over the course of the term of the agreement to meet these obligations, we would be obligated to pay a "program payment" of $41.2 million to the SUNY Foundation in such year. Any inability on our part to comply with the requirements of this agreement may result in the payment of significant amounts to the SUNY Foundation, the termination of our lease at Gigafactory 2, and/or the need to secure an alternative supply of PV cells and modules for our solar products. Moreover, if we are unable to utilize our manufacturing and technology assets in accordance with our expectations, we may have to recognize accounting charges pertaining to the write-off of such assets. Any of the foregoing events could have a material adverse effect on our business, prospects, financial condition and operating results.

If we are unable to attract and/or retain key employees and hire qualified personnel, our ability to compete could be harmed.

The loss of the services of any of our key employees could disrupt our operations, delay the development and introduction of our vehicles and services, and negatively impact our business, prospects and operating results. In particular, we are highly dependent on the services of Elon Musk, our Chief Executive Officer, and Jeffrey B. Straubel, our Chief Technology Officer.

None of our key employees is bound by an employment agreement for any specific term and we may not be able to successfully attract and retain senior leadership necessary to grow our business. Our future success depends upon our ability to attract and retain executive officers and other key technology, sales, marketing, engineering, manufacturing and support personnel, especially to support our high-volume manufacture of vehicles and expansion plans, and any failure or delay in doing so could adversely impact our business, prospects, financial condition and operating results.

Key talent may leave Tesla due to various factors, such as a very competitive labor market for talented individuals with automotive or technology experience, or any negative publicity related to us. In California, Nevada and other regions where we have operations, there is increasing competition for individuals with skillsets needed for our business, including specialized knowledge of electric vehicles, software engineering, manufacturing engineering, and other skills such as electrical and building construction expertise. This competition affects both our ability to retain key employees and hire new ones. Moreover, we have in the past conducted reductions in force in order to optimize our organizational structure and reduce costs, and certain senior personnel have also departed for various reasons. Our continued success depends upon our continued ability to hire new employees in a timely manner, especially to support our expansion plans, and to retain current employees or replace departed senior employees with qualified and experienced individuals, which is typically a time-consuming process. Additionally, we compete with both mature and prosperous companies that have far greater financial resources than we do and start-ups and emerging companies that promise short-term growth opportunities. Difficulties in retaining current employees or recruiting new ones could have an adverse effect on our performance and results.

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Finally, our compensation philosophy for all of our personnel reflects our startup origins, with an emphasis on equity-based awards and benefits in order to closely align their incentives with the long-term interests of our stockholders. Each of our current equity incentive plan and employee stock purchase plan provides for an "evergreen" provision that permits our board of directors to increase on an annual basis, subject to specified limits, the number of equity-based awards that may be granted to, and shares of our common stock that may be purchased by, our personnel thereunder. These plans are currently scheduled to expire in December 2019, and we will need to extend them or establish new plans in order to continue to compensate our employees following their expiration, which will require the approval of our stockholders. Moreover, there is no assurance that these plans as extended or any future plans will contain evergreen provisions, which would mean that we would have to periodically seek and obtain approval from our stockholders for future increases to the number of awards that may be granted and shares that may be purchased under such plans. If we are unable to obtain such stockholder approvals and compensate our personnel in accordance with our compensation philosophy, our ability to retain and hire qualified personnel would be negatively impacted.

We are highly dependent on the services of Elon Musk, our Chief Executive Officer.

We are highly dependent on the services of Elon Musk, our Chief Executive Officer and largest stockholder. Although Mr. Musk spends significant time with Tesla and is highly active in our management, he does not devote his full time and attention to Tesla. Mr. Musk also currently serves as Chief Executive Officer and Chief Technical Officer of Space Exploration Technologies Corp., a developer and manufacturer of space launch vehicles, and is involved in other emerging technology ventures.

We are continuously expanding and improving our information technology systems and use security measures designed to protect our systems against breaches and cyber-attacks. If these efforts are not successful, our business and operations could be disrupted and our operating results and reputation could be harmed.

We are continuously expanding and improving our information technology systems, including implementing new internally developed systems, to assist us in the management of our business. In particular, our volume production of multiple vehicles necessitates continued development, maintenance and improvement of our information technology systems in the U.S. and abroad, which include product data management, procurement, inventory management, production planning and execution, sales, service and logistics, dealer management, financial, tax and regulatory compliance systems. We also maintain information technology measures designed to protect us against intellectual property theft, data breaches and other cyber-attacks. The implementation, maintenance and improvement of these systems require significant management time, support and cost. Moreover, there are inherent risks associated with developing, improving and expanding our core systems as well as implementing new systems, including the disruption of our data management, procurement, manufacturing execution, finance, supply chain and sales and service processes. These risks may affect our ability to manage our data and inventory, procure parts or supplies or manufacture, sell, deliver and service vehicles, or achieve and maintain compliance with, or realize available benefits under, tax laws and other applicable regulations.

We cannot be sure that these systems or their required functionality will be effectively implemented, maintained or expanded as planned. If we do not successfully implement, maintain or expand these systems as planned, our operations may be disrupted, our ability to accurately and/or timely report our financial results could be impaired, and deficiencies may arise in our internal control over financial reporting, which may impact our ability to certify our financial results. Moreover, our proprietary information could be compromised or misappropriated and our reputation may be adversely affected. If these systems or their functionality do not operate as we expect them to, we may be required to expend significant resources to make corrections or find alternative sources for performing these functions.

Any unauthorized control or manipulation of our products' systems could result in loss of confidence in us and our products and harm our business.

Our products contain complex information technology systems. For example, our vehicles and energy storage products are designed with built-in data connectivity to accept and install periodic remote updates from us to improve or update their functionality. We have designed, implemented and tested security measures intended to prevent unauthorized access to our information technology networks, our products and their systems. However, hackers have reportedly attempted, and may attempt in the future, to gain unauthorized access to modify, alter and use such networks, products and systems to gain control of, or to change, our products' functionality, user interface and performance characteristics, or to gain access to data stored in or generated by our products. We encourage reporting of potential vulnerabilities in the security of our products via our security vulnerability reporting policy, and we aim to remedy any reported and verified vulnerability. Accordingly, we have received reports of potential vulnerabilities in the past and have attempted to remedy them. However, there can be no assurance that vulnerabilities will not be exploited in the future before they can be identified, or that our remediation efforts are or will be successful.

Any unauthorized access to or control of our products or their systems or any loss of data could result in legal claims or proceedings. In addition, regardless of their veracity, reports of unauthorized access to our products, their systems or data, as well as other factors that may result in the perception that our products, their systems or data are capable of being "hacked," could negatively affect our brand and harm our business, prospects, financial condition and operating results. We have been the subject of such reports in the past.

We are subject to various environmental and safety laws and regulations that could impose substantial costs upon us and negatively impact our ability to operate our manufacturing facilities.

As a manufacturing company, including with respect to facilities such as the Tesla Factory, Gigafactory 1 and Gigafactory 2, we are subject to complex environmental, health and safety laws and regulations at numerous jurisdictional levels in the U.S. and abroad, including laws relating to the use, handling, storage, disposal and human exposure to hazardous materials. The costs of compliance, including remediating contamination if any is found on our properties and any changes to our operations mandated by new or amended laws, may be significant. We may also face unexpected delays in obtaining permits and approvals required by such laws in connection with our manufacturing facilities, which would hinder our operation of these facilities. Such costs and delays may adversely impact our business prospects and operating results. Furthermore, any violations of these laws may result in substantial fines and penalties, remediation costs, third party damages, or a suspension or cessation of our operations.

Our business may be adversely affected by any disruptions caused by union activities.

It is common for employees at companies with significant manufacturing operations such as us to belong to a union, which can result in higher employee costs and increased risk of work stoppages. Moreover, regulations in some jurisdictions outside of the U.S. mandate employee participation in industrial collective bargaining agreements and work councils with certain consultation rights with respect to the relevant companies' operations. Although we work diligently to provide the best possible work environment for our employees, they may still decide to join or seek recognition to form a labor union, or we may be required to become a union signatory. The United Automobile Workers ("UAW") has been engaged in a campaign to organize manufacturing operations at Tesla. As part of that campaign, the UAW has filed with the National Labor Relations Board ("NLRB") a series of unfair labor practice charges against Tesla on which a hearing recently concluded. We cannot predict the timing of the NLRB's decision, and an unfavorable outcome for Tesla may have a negative impact on the perception of Tesla's treatment of our employees. Furthermore, we are directly or indirectly dependent upon companies with unionized work forces, such as parts suppliers and trucking and freight companies, and work stoppages or strikes organized by such unions could have a material adverse impact on our business, financial condition or operating results. If a work stoppage occurs, it

could delay the manufacture and sale of our products and have a material adverse effect on our business, prospects, operating results or financial condition.

Our products and services are subject to substantial regulations, which are evolving, and unfavorable changes or failure by us to comply with these regulations could substantially harm our business and operating results.

Motor vehicles are subject to substantial regulation under international, federal, state and local laws. We incur significant costs in complying with these regulations and may be required to incur additional costs to comply with any changes to such regulations, and any failures to comply could result in significant expenses, delays or fines. We are subject to laws and regulations applicable to the supply, manufacture, import, sale and service of automobiles internationally. For example, in countries outside of the U.S., we are required to meet standards relating to vehicle safety, fuel economy and emissions, among other things, that are often materially different from requirements in the U.S., thus resulting in additional investment into the vehicles and systems to ensure regulatory compliance in those countries. This process may include official review and certification of our vehicles by foreign regulatory agencies prior to market entry, as well as compliance with foreign reporting and recall management systems requirements.

Additionally, our vehicles are equipped with a suite of driver-assistance features called Autopilot, which help assist drivers with certain tedious and potentially dangerous aspects of road travel, but require drivers to remain engaged. There is a variety of international, federal and state regulations that may apply to self-driving vehicles, which include many existing vehicle standards that were not originally intended to apply to vehicles that may not have a driver. Such regulations continue to rapidly change, which increases the likelihood of a patchwork of complex or conflicting regulations, or may delay products or restrict self-driving features and availability, any of which could adversely affect our business.

Moreover, as a manufacturer and installer of solar generation and energy storage systems and a supplier of electricity generated and stored by the solar energy and energy storage systems we install for customers, we are impacted by federal, state and local regulations and policies concerning electricity pricing, the interconnection of electricity generation and storage equipment with the electric grid, and the sale of electricity generated by third-party owned systems. For example, existing or proposed regulations and policies would permit utilities to limit the amount of electricity generated by our customers with their solar energy systems, charge fees and penalties to our customers relating to the purchase of energy other than from the grid, adjust electricity rate designs such that the price of our solar products may not be competitive with that of electricity from the grid, restrict us and our customers from transacting under our PPAs or qualifying for government incentives and benefits that apply to solar power, and limit or eliminate net energy metering. If such regulations and policies remain in effect or are adopted in other jurisdictions, or if other regulations and policies that adversely impact the interconnection or use of our solar and energy storage systems are introduced, they could deter potential customers from purchasing our solar and energy storage products, threaten the economics of our existing contracts and cause us to cease solar and energy storage system sales and operations in the relevant jurisdictions, which could harm our business, prospects, financial condition and results of operations.

Failure to comply with various privacy and consumer protection laws to which we are subject could harm the Company.

Our privacy policy is posted on our website, and any failure by us or our vendor or other business partners to comply with it or with federal, state or international privacy, data protection or security laws or regulations could result in regulatory or litigation-related actions against us, legal liability, fines, damages and other costs. Substantial expenses and operational changes may be required in connection with maintaining compliance with such laws, and in particular certain emerging privacy laws are still subject to a high degree of uncertainty as to their interpretation and application. For example, in May 2018, the General Data Protection Regulation (the “GDPR”) began to fully apply to the processing of personal information collected from individuals located in the European Union. The GDPR has created new compliance obligations and has significantly increased fines for noncompliance. Although we take steps to protect the security of our customers’ personal information, we may be required to expend significant resources to comply with

data breach requirements if third parties improperly obtain and use the personal information of our customers or we otherwise experience a data loss with respect to customers' personal information. A major breach of our network security and systems could have negative consequences for our business and future prospects, including possible fines, penalties and damages, reduced customer demand for our vehicles and harm to our reputation and brand.

We may choose to or be compelled to undertake product recalls or take other similar actions, which could adversely affect our brand image and financial performance.

Any product recall with respect to our products may result in adverse publicity, damage our brand and adversely affect our business, prospects, operating results and financial condition. For example, certain vehicle recalls that we initiated have resulted from various causes, including a component that could prevent the parking brake from releasing once engaged, a concern with the firmware in the restraints control module in certain right-hand-drive vehicles, industry-wide issues with airbags from a particular supplier, Model X seat components that could cause unintended seat movement during a collision, and concerns of corrosion in Model S power steering assist motor bolts. Furthermore, testing of our products by government regulators or industry groups may require us to initiate product recalls or may result in negative public perceptions about the safety of our products. In the future, we may at various times, voluntarily or involuntarily, initiate a recall if any of our products or our electric vehicle powertrain components that we have provided to other vehicle OEMs, including any systems or parts sourced from our suppliers, prove to be defective or noncompliant with applicable laws and regulations, such as federal motor vehicle safety standards. Such recalls, whether voluntary or involuntary or caused by systems or components engineered or manufactured by us or our suppliers, could involve significant expense and could adversely affect our brand image in our target markets, as well as our business, prospects, financial condition and results of operations.

Our current and future warranty reserves may be insufficient to cover future warranty claims which could adversely affect our financial performance.

Subject to separate limited warranties for the supplemental restraint system, battery and drive unit, we provide four-year or 50,000-mile limited warranties for the purchasers of new Model 3, Model S and Model X vehicles and either a four-year or 50,000-mile limited warranty or a two-year or 100,000-mile maximum odometer limited warranty for the purchasers of used Model S or Model X vehicles certified and sold by us. The limited warranty for the battery and drive unit for new Model S and Model X vehicles covers the drive unit for eight years, as well as the battery for a period of eight years (or for certain older vehicles, 125,000 miles if reached sooner than eight years), although the battery's charging capacity is not covered under any of our warranties or Extended Service plans; the limited warranty for used Model S and Model X vehicles does not extend or otherwise alter the terms of the original battery and drive unit limited warranty for such used vehicles specified in their original New Vehicle Limited Warranty. For the battery and drive unit on our current new Model 3 vehicles, we offer an eight-year or 100,000-mile limited warranty for our standard or mid-range battery and an eight-year or 120,000-mile limited warranty for our long-range battery, with minimum 70% retention of battery capacity over the warranty period. In addition, customers of new Model S and Model X vehicles have the opportunity to purchase an Extended Service plan for the period after the end of the limited warranty for their new vehicles to cover additional services for up to an additional four years or 50,000 miles.

For energy storage products, we provide limited warranties against defects and to guarantee minimum energy retention levels. For example, we currently guarantee that each Powerwall 2 product will maintain at least 70 or 80% (depending on the region of installation) of its stated energy capacity after 10 years, and that each Powerpack 2 product will retain specified minimum energy capacities in each of its first 15 years of use. For our Solar Roof, we currently offer a warranty on the glass tiles for the lifetime of a customer's home and a separate warranty for the energy generation capability of the solar tiles. We also offer extended warranties, availability guarantees and capacity guarantees for periods of up to 20 years at an additional cost at the time of purchase, as well as workmanship warranties to customers who elect to have us install their systems.

Finally, customers who lease solar energy system leases or buy energy from us under PPAs are covered by warranties equal to the length of the agreement term, which is typically 20 years. Systems purchased for cash are covered by a workmanship warranty of up to 20 years. In addition, we pass through to our customers the inverter and panel manufacturers' warranties, which generally range from 10 to 25 years. Finally, we provide a performance guarantee

with our leased solar energy systems that compensates a customer on an annual basis if their system does not meet the electricity production guarantees set forth in their lease. Under these performance guarantees, we bear the risk of production shortfalls resulting from an inverter or panel failure. These risks are exacerbated in the event the panel or inverter manufacturers cease operations or fail to honor their warranties.

If our warranty reserves are inadequate to cover future warranty claims on our products, our business, prospects, financial condition and operating results could be materially and adversely affected. Warranty reserves include our management's best estimate of the projected costs to repair or to replace items under warranty. These estimates are based on actual claims incurred to-date and an estimate of the nature, frequency and costs of future claims. Such estimates are inherently uncertain and changes to our historical or projected experience, especially with respect to products such as Model 3 and Solar Roof that we have recently introduced and/or that we expect to produce at significantly greater volumes than our past products, may cause material changes to our warranty reserves in the future.

Our insurance strategy may not be adequate to protect us from all business risks.

We may be subject, in the ordinary course of business, to losses resulting from products liability, accidents, acts of God and other claims against us, for which we may have no insurance coverage. As a general matter, we do not maintain as much insurance coverage as many other companies do, and in some cases, we do not maintain any at all. Additionally, the policies that we do have may include significant deductibles or self-insured retentions, and we cannot be certain that our insurance coverage will be sufficient to cover all future losses or claims against us. A loss that is uninsured or which exceeds policy limits may require us to pay substantial amounts, which could adversely affect our financial condition and operating results.

Our financial results may vary significantly from period-to-period due to fluctuations in our operating costs and other factors.

We expect our period-to-period financial results to vary based on our operating costs, which we anticipate will fluctuate as the pace at which we continue to design, develop and manufacture new products and increase production capacity by expanding our current manufacturing facilities and adding future facilities such as Gigafactory Shanghai may not be consistent or linear between periods. Additionally, our revenues from period-to-period may fluctuate as we introduce existing products to new markets for the first time and as we develop and introduce new products. As a result of these factors, we believe that quarter-to-quarter comparisons of our financial results, especially in the short term, are not necessarily meaningful and that these comparisons cannot be relied upon as indicators of future performance. Moreover, our financial results may not meet expectations of equity research analysts, ratings agencies or investors, who may be focused only on quarterly financial results. If any of this occurs, the trading price of our stock could fall substantially, either suddenly or over time.

Servicing our indebtedness requires a significant amount of cash, and there is no guarantee that we will have sufficient cash flow from our business to pay our substantial indebtedness.

As of December 31, 2018, we and our subsidiaries had outstanding $11.00 billion in aggregate principal amount of indebtedness (see Note 13, Long-Term Debt Obligations, to the consolidated financial statements included elsewhere in this Annual Report on Form 10-K). Our substantial consolidated indebtedness may increase our vulnerability to any generally adverse economic and industry conditions. We and our subsidiaries may, subject to the limitations in the terms of our existing and future indebtedness, incur additional debt, secure existing or future debt or recapitalize our debt.

Pursuant to their terms, holders of our 0.25% Convertible Senior Notes due 2019, 1.25% Convertible Senior Notes due 2021 and 2.375% Convertible Senior Notes due 2022 (collectively, the "Tesla Convertible Notes") may convert their respective Tesla Convertible Notes at their option prior to the scheduled maturities of the respective Tesla Convertible Notes under certain circumstances. Upon conversion of the applicable Tesla Convertible Notes, we will be obligated to deliver cash and/or shares in respect of the principal amounts thereof and the conversion value in excess of such principal amounts on such Tesla Convertible Notes. Moreover, our subsidiary's 1.625% Convertible

Senior Notes due 2019 and Zero-Coupon Convertible Senior Notes due 2020 (together, the “Subsidiary Convertible Notes”) are convertible into shares of our common stock at conversion prices ranging from $300.00 to $759.36 per share. Finally, holders of the Tesla Convertible Notes and the Subsidiary Convertible Notes will have the right to require us to repurchase their notes upon the occurrence of a fundamental change at a purchase price equal to 100% of the principal amount of the notes, plus accrued and unpaid interest, if any, to, but not including, the fundamental change purchase date.

Our ability to make scheduled payments of the principal and interest on our indebtedness when due or to make payments upon conversion or repurchase demands with respect to our convertible notes, or to refinance our indebtedness as we may need or desire, depends on our future performance, which is subject to economic, financial, competitive and other factors beyond our control. Our business may not continue to generate cash flow from operations in the future sufficient to satisfy our obligations under our existing indebtedness, and any future indebtedness we may incur, and to make necessary capital expenditures. If we are unable to generate such cash flow, we may be required to adopt one or more alternatives, such as reducing or delaying investments or capital expenditures, selling assets, refinancing or obtaining additional equity capital on terms that may be onerous or highly dilutive. Our ability to refinance existing or future indebtedness will depend on the capital markets and our financial condition at such time. In addition, our ability to make payments may be limited by law, by regulatory authority or by agreements governing our future indebtedness. We may not be able to engage in any of these activities or engage in these activities on desirable terms or at all, which could result in a default on our existing or future indebtedness and have a material adverse effect on our business, results of operations and financial condition.

Our debt agreements contain covenant restrictions that may limit our ability to operate our business.

The terms of certain of our credit facilities, including our senior secured asset based revolving credit agreement, contain, and any of our other future debt agreements may contain, covenant restrictions that limit our ability to operate our business, including restrictions on our ability to, among other things, incur additional debt or issue guarantees, create liens, repurchase stock or make other restricted payments, and make certain voluntary prepayments of specified debt. In addition, under certain circumstances we are required to comply with a fixed charge coverage ratio. As a result of these covenants, our ability to respond to changes in business and economic conditions and engage in beneficial transactions, including to obtain additional financing as needed, may be restricted. Furthermore, our failure to comply with our debt covenants could result in a default under our debt agreements, which could permit the holders to accelerate our obligation to repay the debt. If any of our debt is accelerated, we may not have sufficient funds available to repay it.

We may need or want to raise additional funds and these funds may not be available to us when we need them. If we cannot raise additional funds when we need or want them, our operations and prospects could be negatively affected.

The design, manufacture, sale, installation and/or servicing of automobiles, energy storage products and solar products is a capital intensive business, and the specific timing of cash inflows and outflows may fluctuate substantially from period to period. Until we are consistently generating positive free cash flows, we may need or want to raise additional funds through the issuance of equity, equity-related or debt securities or through obtaining credit from financial institutions to fund, together with our principal sources of liquidity, the costs of developing and manufacturing our current or future vehicles, energy storage products and/or solar products, to pay any significant unplanned or accelerated expenses or for new significant strategic investments, or to refinance our significant consolidated indebtedness, even if not required to do so by the terms of such indebtedness. We need sufficient capital to fund our ongoing operations, ramp vehicle production, continue research and development projects, establish sales, delivery and service centers, build and deploy Superchargers, expand Gigafactory 1, ramp production at Gigafactory 2, build and commence Model 3 production at Gigafactory Shanghai and to make the investments in tooling and manufacturing capital required to introduce new vehicles, energy storage products and solar products. We cannot be certain that additional funds will be available to us on favorable terms when required, or at all. If we cannot raise additional funds when we need them, our financial condition, results of operations, business and prospects could be materially and adversely affected.

Additionally, we use capital from third-party investors to enable our customers' access to our solar energy systems with little or no upfront cost. The availability of this financing depends upon many factors, including the confidence of the investors in the solar energy industry, the quality and mix of our customer contracts, any regulatory changes impacting the economics of our existing customer contracts, changes in law (including tax law), risks or government incentives associated with these financings, and our ability to compete with other renewable energy companies for the limited number of potential investors. Moreover, while interest rates remain at low levels, they have risen in recent periods. If the rate of return required by investors rises as a result of a rise in interest rates, it will reduce the present value of the customer payment streams underlying, and therefore the total value of, our financing structures, increasing our cost of capital. If we are unable to establish new financing funds on favorable terms for third-party ownership arrangements, we may be unable to finance the installation of our solar energy systems for our lease or PPA customers' systems, or our cost of capital could increase and our liquidity may be negatively impacted, which would have an adverse effect on our business, financial condition and results of operations.

We could be subject to liability, penalties and other restrictive sanctions and adverse consequences arising out of certain governmental investigations and proceedings.

We are cooperating with certain government investigations as discussed in Note 17, Commitments and Contingencies, to the consolidated financial statements included elsewhere in this Annual Report on Form 10-K. Aside from the settlement with the SEC discussed below relating to Elon Musk's statement that he was considering taking Tesla private, to our knowledge no government agency in any ongoing investigation has concluded that any wrongdoing occurred. However, we cannot predict the outcome or impact of any ongoing matters, and there exists the possibility that we could be subject to liability, penalties and other restrictive sanctions and adverse consequences if the SEC, the DOJ, or any other government agency were to pursue legal action in the future. Moreover, we expect to incur costs in responding to related requests for information and subpoenas, and if instituted, in defending against any governmental proceedings.

For example, on October 16, 2018, the U.S. District Court for the Southern District of New York entered a final judgment approving the terms of a settlement filed with the Court on September 29, 2018, in connection with the actions taken by the SEC relating to Mr. Musk's statement on August 7, 2018 that he was considering taking Tesla private. Pursuant to the settlement, we, among other things, paid a civil penalty of $20 million, appointed an independent director as the Chair of the Board, appointed two additional independent directors to the Board, and made further enhancements to our disclosure controls and other corporate governance-related matters. Although we intend to continue to comply with the terms and requirements of the settlement, if there is a lack of compliance, additional enforcement actions or other legal proceedings may be instituted against us.

If we update or discontinue the use of our manufacturing equipment more quickly than expected, we may have to shorten the useful lives of any equipment to be retired as a result of any such update, and the resulting acceleration in our depreciation could negatively affect our financial results.

We have invested and expect to continue to invest significantly in what we believe is state of the art tooling, machinery and other manufacturing equipment for our various product lines, and we depreciate the cost of such equipment over their expected useful lives. However, manufacturing technology may evolve rapidly, and we may decide to update our manufacturing process with cutting-edge equipment more quickly than expected. Moreover, we are continually implementing learnings as our engineering and manufacturing expertise and efficiency increase, which may result in our ability to manufacture our products using less of our currently installed equipment. Alternatively, as we ramp production of Model 3 to higher levels, our learnings may cause us to discontinue the use of already installed equipment in favor of different or additional equipment. The useful life of any equipment that would be retired early as a result would be shortened, causing the depreciation on such equipment to be accelerated, and our results of operations could be negatively impacted.

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We are exposed to fluctuations in currency exchange rates, which could negatively affect our financial results.

Our revenues and costs denominated in foreign currencies are not completely matched. As we have increased vehicle deliveries in markets outside of the U.S., we have much higher revenues than costs denominated in other currencies such as the euro, Canadian dollar, Chinese yuan and Norwegian krone. Any strengthening of the U.S. dollar would tend to reduce our revenues as measured in U.S. dollars, as we have historically experienced. In addition, a portion of our costs and expenses have been, and we anticipate will continue to be, denominated in foreign currencies, including the Japanese yen. If we do not have fully offsetting revenues in these currencies and if the value of the U.S. dollar depreciates significantly against these currencies, our costs as measured in U.S. dollars as a percent of our revenues will correspondingly increase and our margins will suffer. Moreover, while we undertake limited hedging activities intended to offset the impact of currency translation exposure, it is impossible to predict or eliminate such impact. As a result, our operating results could be adversely affected.

We may face regulatory limitations on our ability to sell vehicles directly which could materially and adversely affect our ability to sell our electric vehicles.

We sell our vehicles directly to consumers using means that we believe will maximize our reach, currently including through our website and our own stores. While we intend to continue to leverage our most effective sales strategies, we may not be able to sell our vehicles through our own stores in each state in the U.S., as some states have laws that may be interpreted to impose limitations on this direct-to-consumer sales model. In certain states in which we are not able to obtain dealer licenses, we have opened galleries, which are not full sales locations.

The application of these state laws to our operations continues to be difficult to predict. Laws in some states have limited our ability to obtain dealer licenses from state motor vehicle regulators and may continue to do so.

In addition, decisions by regulators permitting us to sell vehicles may be challenged by dealer associations and others as to whether such decisions comply with applicable state motor vehicle industry laws. We have prevailed in many of these lawsuits and such results have reinforced our continuing belief that state laws were not designed to prevent our distribution model. In some states, there have also been regulatory and legislative efforts by dealer associations to propose laws that, if enacted, would prevent us from obtaining dealer licenses in their states given our current sales model. A few states have passed legislation that clarifies our ability to operate, but at the same time limits the number of dealer licenses we can obtain or stores that we can operate. We have also filed a lawsuit in federal court in Michigan challenging the constitutionality of the state’s prohibition on direct sales as applied to our business.

Internationally, there may be laws in jurisdictions we have not yet entered or laws we are unaware of in jurisdictions we have entered that may restrict our sales or other business practices. Even for those jurisdictions we have analyzed, the laws in this area can be complex, difficult to interpret and may change over time. Continued regulatory limitations and other obstacles interfering with our ability to sell vehicles directly to consumers could have a negative and material impact our business, prospects, financial condition and results of operations.

We may need to defend ourselves against intellectual property infringement claims, which may be time-consuming and could cause us to incur substantial costs.

Others, including our competitors, may hold or obtain patents, copyrights, trademarks or other proprietary rights that could prevent, limit or interfere with our ability to make, use, develop, sell or market our products and services, which could make it more difficult for us to operate our business. From time to time, the holders of such intellectual property rights may assert their rights and urge us to take licenses, and/or may bring suits alleging infringement or misappropriation of such rights. We may consider the entering into licensing agreements with respect to such rights, although no assurance can be given that such licenses can be obtained on acceptable terms or that litigation will not

occur, and such licenses could significantly increase our operating expenses. In addition, if we are determined to have infringed upon a third party's intellectual property rights, we may be required to cease making, selling or incorporating certain components or intellectual property into the goods and services we offer, to pay substantial damages and/or license royalties, to redesign our products and services, and/or to establish and maintain alternative branding for our products and services. In the event that we were required to take one or more such actions, our business, prospects, operating results and financial condition could be materially adversely affected. In addition, any litigation or claims, whether or not valid, could result in substantial costs, negative publicity and diversion of resources and management attention.

Tesla is a highly-visible public company whose products, business, results of operations, statements and actions are often scrutinized by critics whose influence could negatively impact the perception of our brand and the market value of our common stock.

Tesla is a highly-visible public company whose products, business, results of operations, statements and actions are well-publicized. Such attention includes frequent criticism of us by a range of third-parties. Our continued success depends on our ability to focus on executing on our mission and business plan while maintaining the trust of our current and potential customers, employees, stockholders and business partners. Any negative perceived actions of ours could influence the perception of our brand or our leadership by our customers, suppliers or investors, which could adversely impact our business prospects, operating results and the market value of our common stock.

Our facilities or operations could be damaged or adversely affected as a result of disasters.

Our corporate headquarters, the Tesla Factory and Gigafactory 1 are located in seismically active regions in Northern California and Nevada. If major disasters such as earthquakes or other events occur, or our information system or communications network breaks down or operates improperly, our headquarters and production facilities may be seriously damaged, or we may have to stop or delay production and shipment of our products. We may incur expenses relating to such damages, which could have a material adverse impact on our business, operating results and financial condition.

Risks Related to the Ownership of Our Common Stock

The trading price of our common stock is likely to continue to be volatile.

The trading price of our common stock has been highly volatile and could continue to be subject to wide fluctuations in response to various factors, some of which are beyond our control. Our common stock has experienced an intra-day trading high of $387.46 per share and a low of $244.59 per share over the last 52 weeks. The stock market in general, and the market for technology companies in particular, has experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of those companies. In particular, a large proportion of our common stock has been and may continue to be traded by short sellers which may put pressure on the supply and demand for our common stock, further influencing volatility in its market price. Public perception and other factors outside of our control may additionally impact the stock price of companies like us that garner a disproportionate degree of public attention, regardless of actual operating performance. In addition, in the past, following periods of volatility in the overall market and the market price of a particular company’s securities, securities class action litigation has often been instituted against these companies. Moreover, stockholder litigation like this has been filed against us in the past. While we are continuing to defend such actions vigorously, any judgment against us or any future stockholder litigation could result in substantial costs and a diversion of our management’s attention and resources.

We may fail to meet our publicly announced guidance or other expectations about our business, which could cause our stock price to decline.

We provide guidance regarding our expected financial and business performance, such as projections regarding sales and production, as well as anticipated future revenues, gross margins, profitability and cash flows. Correctly identifying key factors affecting business conditions and predicting future events is inherently an uncertain process and our guidance may not ultimately be accurate. Our guidance is based on certain assumptions such as those relating to anticipated production and sales volumes (which generally are not linear throughout a given period), average sales prices, supplier and commodity costs, and planned cost reductions. If our guidance is not accurate or varies from actual results due to our inability to meet our assumptions or the impact on our financial performance that could occur

as a result of various risks and uncertainties, the market value of our common stock could decline significantly.

Transactions relating to our convertible notes may dilute the ownership interest of existing stockholders, or may otherwise depress the price of our common stock.

The conversion of some or all of the Tesla Convertible Notes or the Subsidiary Convertible Notes would dilute the ownership interests of existing stockholders to the extent we deliver shares upon conversion of any of such notes. Our Subsidiary Convertible Notes have been historically, and the other Tesla Convertible Notes may become in the future, convertible at the option of their holders prior to their scheduled terms under certain circumstances. If holders elect to convert their convertible notes, we could be required to deliver to them a significant number of shares of our common stock. Any sales in the public market of the common stock issuable upon such conversion could adversely affect prevailing market prices of our common stock. In addition, the existence of the convertible notes may encourage short selling by market participants because the conversion of such notes could be used to satisfy short positions, or anticipated conversion of such notes into shares of our common stock could depress the price of our common stock.

Moreover, in connection with each issuance of the Tesla Convertible Notes, we entered into convertible note hedge transactions, which are expected to reduce the potential dilution and/or offset potential cash payments we are required to make in excess of the principal amount upon conversion of the applicable Tesla Convertible Notes. We also entered into warrant transactions with the hedge counterparties, which could separately have a dilutive effect on our common stock to the extent that the market price per share of our common stock exceeds the applicable strike price of the warrants on the applicable expiration dates. In addition, the hedge counterparties or their affiliates may enter into various transactions with respect to their hedge positions, which could also cause or prevent an increase or a decrease in the market price of our common stock or the convertible notes.

Elon Musk has pledged shares of our common stock to secure certain bank borrowings. If Mr. Musk were forced to sell these shares pursuant to a margin call that he could not avoid or satisfy, such sales could cause our stock price to decline.

Certain banking institutions have made extensions of credit to Elon Musk, our Chief Executive Officer, a portion of which was used to purchase shares of common stock in certain of our public offerings and private placements at the same prices offered to third party participants in such offerings and placements. We are not a party to these loans, which are partially secured by pledges of a portion of the Tesla common stock currently owned by Mr. Musk. If the price of our common stock were to decline substantially and Mr. Musk were unable to avoid or satisfy a margin call with respect to his pledged shares, Mr. Musk may be forced by one or more of the banking institutions to sell shares of Tesla common stock in order to remain within the margin limitations imposed under the terms of his loans. Any such sales could cause the price of our common stock to decline further.

Anti-takeover provisions contained in our governing documents, applicable laws and our convertible notes could impair a takeover attempt.

Our certificate of incorporation and bylaws afford certain rights and powers to our board of directors that could contribute to the delay or prevention of an acquisition that it deems undesirable. We are also subject to Section 203 of the Delaware General Corporation Law and other provisions of Delaware law that limit the ability of stockholders in certain situations to effect certain business combinations. In addition, the terms of our convertible notes require us to repurchase such notes in the event of a fundamental change, including a takeover of our company. Any of the foregoing provisions and terms that has the effect of delaying or deterring a change in control could limit the opportunity for our stockholders to receive a premium for their shares of our common stock, and could also affect the price that some investors are willing to pay for our common stock.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

The following table sets forth the location, approximate current occupancy size and primary use of our principal leased and owned facilities:

Location	Approximate Size of Facilities (in Square Feet)	Primary Use	Lease Expiration Date
Fremont, California	5,500,000	Manufacturing, administration, engineering, service, delivery and warehouse	Owned building
Sparks, Nevada	5,024,350	*Gigafactory 1, production of lithium-ion battery cells and vehicle drive units	Owned building
Tilburg, Netherlands	1,688,217	Manufacturing, administration, engineering and service	November 2023 - June 2028
Fremont, California	1,237,772	Administration, manufacturing and engineering	October 2025 - June 2030
Livermore, California	1,002,703	Warehouse	October 2026
Lathrop, California	885,867	Warehouse and manufacturing	September 2024 - February 2030
Sparks, Nevada	632,445	Warehouse	December 2019 - December 2020
Lathrop, California	496,888	Manufacturing	Owned building
Palo Alto, California	350,000	Administration and engineering	January 2022
Taipei City, Taiwan	283,790	Warehouse, administration and service	February 2022
Elkridge, Maryland	176,651	Warehouse	October 2023
Grand Rapids, Michigan	176,606	Manufacturing	May 2025
Draper, Utah	154,846	Administration	October 2027
Hawthorne, California	132,250	Engineering	December 2022
Bethlehem, Pennsylvania	130,971	Warehouse	April 2022

* These facilities are currently in construction and the approximate square footage as presented represent the current occupancy as of December 31, 2018.

In addition to the properties included in the table above, we also lease a large number of properties in North America, Europe and Asia for our retail and service locations, Supercharger sites, solar installation and maintenance warehouses and regional administrative and sales offices for our solar business. Our properties are used to support both of our reporting segments.

We will begin leasing a 1.1 million square feet solar manufacturing facility (Gigafactory 2 in Buffalo, New York) for an initial term of 10 years and a 0.9 million square feet warehouse and manufacturing facility in Lathrop, California for an initial term of 11.5 years upon construction completion of the facilities. Additionally, we purchased the land use rights with an initial term of 50 years for Gigafactory Shanghai in December 2018 and began construction of the facility in January 2019. Once construction has completed, we expect the building to have a capacity of 4.5 million

square feet.

ITEM 3. LEGAL PROCEEDINGS

For a description of our material pending legal proceedings, please see Note 17, Commitments and Contingencies, to the consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Market Information

Our common stock has traded on The NASDAQ Global Select Market under the symbol "TSLA" since it began trading on June 29, 2010. Our initial public offering was priced at $17.00 per share on June 28, 2010.

Holders

As of January 31, 2018, there were 1,145 holders of record of our common stock. A substantially greater number of holders of our common stock are "street name" or beneficial holders, whose shares are held by banks, brokers and other financial institutions.

Dividend Policy

We have never declared or paid cash dividends on our common stock. We currently do not anticipate paying any cash dividends in the foreseeable future. Any future determination to declare cash dividends will be made at the discretion of our board of directors, subject to applicable laws, and will depend on our financial condition, results of operations, capital requirements, general business conditions and other factors that our board of directors may deem relevant.

Stock Performance Graph

This performance graph shall not be deemed "filed" for purposes of Section 18 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), or incorporated by reference into any filing of Tesla, Inc. under the Securities Act of 1933, as amended (the "Securities Act"), or the Exchange Act, except as shall be expressly set forth by specific reference in such filing.

The following graph shows a comparison, from January 1, 2014 through December 31, 2018, of the cumulative total return on our common stock, The NASDAQ Composite Index and a group of all public companies sharing the same SIC code as us, which is SIC code 3711, “Motor Vehicles and Passenger Car Bodies” (Motor Vehicles and Passenger Car Bodies Public Company Group). Such returns are based on historical results and are not intended to suggest future performance. Data for The NASDAQ Composite Index and the Motor Vehicles and Passenger Car Bodies Public Company Group assumes an investment of $100 on January 1, 2014 and reinvestment of dividends. We have never declared or paid cash dividends on our common stock nor do we anticipate paying any such cash dividends in the foreseeable future.

Unregistered Sales of Equity Securities

Exercises of Warrants

In connection with the offering in 2013 of our 1.50% Convertible Senior Notes due 2018, we sold warrants to each of Goldman, Sachs & Co. and Morgan Stanley & Co. LLC (the “Warrantholders”). Between October 1, 2018 and October 31, 2018, we issued an aggregate of 132,977 shares of our common stock to the Warrantholders pursuant to their exercise of such warrants, which were net of the applicable exercise prices. Such shares were issued pursuant to an exemption from registration provided by Rule 3(a)(9) of the Securities Act.

Private Placement to CEO

On November 9, 2018, we sold 56,915 shares of our common stock to our CEO in a private placement pursuant to an exemption from registration provided by Rule 4(a)(2) of the Securities Act, at a per share price equal to the last closing price of our stock prior to the execution of the purchase agreement, and received total cash proceeds of $20.0 million.

Conversion of Convertible Senior Notes

On December 17, 2018, we issued 10 shares of our common stock to a former holder of the 1.625% Convertible Senior Notes due in 2019 issued by our subsidiary in connection with such holder’s conversion of $8,000 in principal amount of such notes. Such shares were issued pursuant to an exemption from registration provided by Rule 3(a)(9) of the Securities Act.

Purchases of Equity Securities by the Issuer and Affiliated Purchasers

None

ITEM 6. SELECTED CONSOLIDATED FINANCIAL DATA

The following selected consolidated financial data should be read in conjunction with “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and the consolidated financial statements and the related notes included elsewhere in this Annual Report on Form 10-K to fully understand factors that may affect the comparability of the information presented below (in thousands, except per share data).

	Year Ended December 31,				
	2018 (2)	2017	2016 (1)	2015	2014
Consolidated Statements of Operations Data:					
Total revenues	$21,461,268	$11,758,751	$7,000,132	$4,046,025	$3,198,356
Gross profit	$4,042,021	$2,222,487	$1,599,257	$923,503	$881,671
Loss from operations	$(388,073)	$(1,632,086)	$(667,340)	$(716,629)	$(186,689)
Net loss attributable to common stockholders	$(976,091)	$(1,961,400)	$(674,914)	$(888,663)	$(294,040)
Net loss per share of common stock attributable to common stockholders, basic and diluted	$(5.72)	$(11.83)	$(4.68)	$(6.93)	$(2.36)
Weighted average shares used in computing net loss per share of common stock, basic and diluted	170,525	165,758	144,212	128,202	124,539

	As of December 31,				
	2018 (2)	2017	2016 (1)	2015	2014
Consolidated Balance Sheet Data:					
Working (deficit) capital	$(1,685,828)	$(1,104,150)	$432,791	$(29,029)	$1,072,907
Total assets	29,739,614	28,655,372	22,664,076	8,067,939	5,830,667
Total long-term obligations	13,433,874	15,348,310	10,923,162	4,125,915	2,753,595

(1) We acquired SolarCity Corporation (“SolarCity”) on November 21, 2016. SolarCity’s financial positions have been included in our financial positions from the acquisition date. See Note 3, Business Combinations, of the notes to the consolidated financial statements for additional information regarding this transaction.

(2) Includes the impact of the adoption of the new revenue recognition accounting standard in 2018. Prior periods have not been revised. See Note 2, Summary of Significant Accounting Policies, of the notes to the consolidated financial statements for further details.

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ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion and analysis should be read in conjunction with the consolidated financial statements and the related notes included elsewhere in this Annual Report on Form 10-K.

Overview and 2018 Highlights

Our mission is to accelerate the world's transition to sustainable energy. We design, develop, manufacture, lease and sell high-performance fully electric vehicles, solar energy generation systems and energy storage products. We also offer maintenance, installation, operation and other services related to our products.

Automotive

Our production vehicle fleet includes our Model S premium sedan and our Model X SUV, which are our highest-performance vehicles, and our Model 3, a lower-priced sedan designed for the mass market. We continue to enhance our vehicle offerings with enhanced Autopilot options, internet connectivity and free over-the-air software updates to provide additional safety, convenience and performance features. In addition, we have several future electric vehicles in our product pipeline, including Model Y, Tesla Semi, a pickup truck and a new version of the Tesla Roadster.

In 2018, we continued to scale our automotive operations, particularly our ramp of Model 3, and achieved total production of 254,530 vehicles and delivered 245,506 vehicles, representing year-over-year increases of approximately 152% and 138%, respectively.

Energy Generation and Storage

We lease and sell retrofit solar energy systems and sell renewable energy and energy storage products to our customers, and are ramping our Solar Roof product that combines solar energy generation with attractive, integrated styling. Our energy storage products, which we manufacture at Gigafactory 1, consist of Powerwall, mostly for residential applications, and Powerpack, for commercial, industrial and utility-scale applications.

During 2018, we deployed 1.04 GWh of energy storage products, nearly tripling our 358 MWh of energy storage deployments during 2017. We also deployed 326 megawatts ("MW") of solar energy generation during 2018.

Management Opportunities, Challenges and Risks and 2019 Outlook

Automotive Demand, Production and Deliveries

Our goal is to produce the world's highest quality vehicles as quickly and as cost-effectively as possible with a priority on workplace health and safety. The worldwide automotive markets for alternative fuel vehicles and self-driving technology are highly competitive and we expect them to become even more so. A growing number of companies, including established automakers, have announced plans to expand, and in some cases fully transition to, production of electric or environmentally friendly vehicles, and/or to develop self-driving technologies. However, we believe that the unique features of our vehicles, the safety aspects of each of our vehicles, our constant innovation, our growing brand, the increased affordability introduced with Model 3, the innovation and expansion of our global retail, service and charging operations and infrastructure and our future vehicles will continue to generate incremental demand for our vehicles by making our vehicles accessible to larger and previously untapped consumer and commercial markets.

Model 3 was the best-selling premium vehicle in the United States in 2018. Vehicles traded in to us by Model 3 customers continue to suggest the existence of a wider addressable market for this vehicle than existing owners of mid-sized premium sedans. Moreover, as we have offered only the long-range, mid-range and performance variants of Model 3 thus far, we believe that we will see increased demand with the introduction of less expensive variants, such as a version with a base price of $35,000 that we intend to offer in the future, and additional financing options. We commenced in January 2019 production of Model 3 for Europe and China, each of which we believe has a much larger mid-sized premium sedan market than North America, where we have exclusively delivered Model 3 to date. We also believe that we have an advantage over our competitors with respect to our battery and powertrain technology, as our vehicles' EPA-rated range per kWh is expected to be superior to that of other electric vehicles to be introduced in the near term, and we have the ability to improve our vehicles through over-the-air software updates. We are producing variants (including regional versions) of Model 3 in accordance with the demand that we expect for them, however, and we have finite production capabilities with long lead times associated with procuring certain parts. If our Model 3 demand expectations prove inaccurate or we experience delays in introducing planned additional variants, including as we begin offering Model 3 in new markets, we may not be able to timely generate sales matched to the specific vehicles that we have the capacity to produce. We may also be impacted by trade policies, political uncertainty and economic cycles involving geographic regions where we have significant operations. Sales of vehicles in the automotive industry also tend to be cyclical in many markets, which may expose us to increased volatility as we expand and adjust our operations and retail strategies. In addition, the federal tax credit for the purchase of a qualified electric vehicle in the U.S. was reduced to $3,750 for any Tesla vehicle delivered during the first or second quarter of 2019, and will be further reduced to $1,875 for each Tesla vehicle delivered in the third or fourth quarter of 2019 and to $0 for each Tesla vehicle delivered thereafter. We believe that this phase-out likely pulled forward some vehicle demand into 2018 and could create similar pull-forwards in 2019 before each further step reduction in the federal tax credit. In the long run, we do not expect a meaningful impact to our sales in the U.S., as we believe that each of our vehicle models offers a compelling proposition even without incentives. Globally, we are also working to, and in some cases have already begun to, increase the value proposition and affordability of our offerings to customers and offer other financing arrangements over time. For example, we intend to introduce leasing options for Model 3.

Our Model 3 production ramped dramatically during 2018, and we expect to continue to grow Model 3 production to a sustained rate of 7,000 vehicles per week at our Tesla Factory by the end of 2019 as we ramp international deliveries. We remain focused on further cost improvements and on increasing the affordability of Model 3. Furthermore, in January 2019 we commenced construction of our Gigafactory Shanghai in China. We expect to build a production process that is optimized and simplified for Model 3 production, comprised of stamping, body joining and paint shops and general assembly, at Gigafactory Shanghai to begin production of certain trims of Model 3 for China by the end of 2019. We believe that the efficiencies of local production, as well as avoiding certain tariffs on U.S.-manufactured vehicles, will allow us to offer Model 3 at a lower average selling price in the largest market for electric vehicles in the world. Inclusive of Gigafactory Shanghai, our goal is to be able to produce 10,000 Model 3 vehicles per week on a sustained basis, and an annualized output rate in excess of 500,000 Model 3 vehicles sometime between the fourth quarter of 2019 and the second quarter of 2020. However, the timeframe for Gigafactory Shanghai is subject to a number of uncertainties, including regulatory approval, supply chain constraints, and the pace of installing production equipment and bringing the factory online. Ultimately, achieving increased Model 3 production cost-effectively will require that we timely address any additional bottlenecks that may arise as we continue to ramp, and establish sustained supplier capacity, including locally at Gigafactory Shanghai.

We also recently discontinued new custom orders for the 75 kWh versions of Model S and Model X to focus on longer range versions of our highest-performance flagship vehicles and further differentiate them from Model 3. We have gradually increased the level of option standardization across these models, and this latest step and our increasing production efficiency have allowed us to reduce the production hours for them while preserving the flexibility to increase output as necessary. As Model S and Model X are produced in the U.S., for the foreseeable future we could be impacted by increased import duties on components sourced from China, as well as by tariffs on

vehicles exported to China, although we intend to partially divert such deliveries to North America and Europe, if necessary.

Advancing our customer-facing infrastructure remains a top priority. Delivering vehicles to our customers and the related logistics were challenging during 2018, but we continue to improve these processes to maximize customer satisfaction, including by purchasing our own car-hauling trucks. We are also expanding our servicing capabilities for our rapidly growing customer vehicle fleet, including by growing our service locations and Mobile Service fleet, moving to two-shift operations at service centers where needed, and optimizing our parts distribution network. We are also updating the Tesla mobile app for scheduling service appointments in order to increase customer convenience. As sales of Tesla vehicles ramp further, we plan to continue to open new Tesla retail locations, service centers and body shops around the world, and we plan to continue to expand our Mobile Service fleet. We also plan to continue to significantly increase the number of Superchargers and Destination Charging connectors globally, as well as evolve our Supercharger technology to enable faster charging times while reducing our related costs. However, we will have to stabilize and sustain our delivery and logistics model to deliver an increasing number of vehicles, and we have only limited experience with this at scale, particularly in markets outside of North America. Moreover, if our growing fleet of customer vehicles, particularly Model 3, experiences unexpected reliability issues, it could overburden our servicing capabilities.

Finally, we are making progress with our self-driving technology, as well as the Autopilot features in our vehicles. Our neural net and functionality continue to improve, and we frequently release minor software updates and from time to time release key version updates. Recently, we launched a “Navigate on Autopilot” feature that allows enabled Tesla vehicles under appropriate circumstances and driver input to change lanes, transition between freeways and exit freeways. While we are subject to regulatory constraints over which we have no control, our ultimate goal is to achieve full autonomy. Additionally, there is growing competition from other automobile and technology companies in the area of self-driving.

Energy Generation and Storage Demand, Production and Deployment

We are continuing to reduce customer acquisition costs of our energy generation products, transitioning away from former channel partners and shifting our sales strategy significantly to sell these products in Tesla stores and on our website and through cross-selling opportunities to our expanding base of vehicle owners. As we continue to implement this strategy, we expect that our retrofit solar system deployments will decrease slightly before stabilizing and growing in the second half of the year, including through cross-selling opportunities to our expanding base of vehicle owners. Our emphasis for retrofit solar products remains on executing projects for upfront cash generation and profitability, rather than absolute volume growth, such as by reducing the mix of leased systems and prioritizing residential installations that are combined with our energy storage products.

We are continuing with the design iterations and testing on our Solar Roof product, and we are continuing installations at a slow pace with the expectation that we will ramp production with significantly improved manufacturing capabilities during 2019.

We expect our energy storage products to continue to experience significant growth, and we are targeting to more than double our deployments to over 2 GWh in 2019. We see opportunities in North America as well as in Australia and Europe, where energy storage coupled with solar generation may mitigate typically higher electricity rates, as well as for projects to increase energy grid reliability. We are continuing to ramp production for these products at Gigafactory 1, including through a new production line, and we have seen further manufacturing efficiencies and improvements in our installation processes as we ramp.

Trends in Cash Flow, Capital Expenditures and Operating Expenses

Capital expenditures in 2019 are projected to be approximately $2.5 billion, mostly to support increases in Model 3 production capacity at Gigafactory 1 and the Tesla Factory, the establishment of Model 3 production capacity at Gigafactory Shanghai, and the addition of manufacturing capacity for Model Y, which we intend to produce in volume by the end of 2020, as well as the ongoing expansion of our retail locations, service centers, body shops, Mobile Service fleet, and Supercharger stations.

Generally, we expect operating expenses as a percentage of revenue to continue to decrease in the future due to increases in expected revenues and as we focus on increasing operational efficiency. In addition, due to our cost management efforts to maximize operational efficiency, we expect operating expenses in 2019 to grow by less than 10% from 2018.

In March 2018, our stockholders approved a new 10-year CEO performance award for Elon Musk with vesting contingent on achieving market capitalization and operational milestones (the "2018 CEO Performance Award"). Consequently, we may incur significant additional non-cash stock-based compensation expense over the term of the award as each operational milestone becomes probable of vesting.

Automotive Financing Options

We offer financing arrangements for our vehicles in certain markets in North America, Europe and Asia primarily through various financial institutions. We offer resale value guarantees or similar buy-back terms to certain customers who purchase vehicles and who finance their vehicles through one of our specified commercial banking partners. We also offer resale value guarantees in connection with automotive sales to certain leasing partners. Currently, both programs are available only in certain international markets. Resale value guarantees available for exercise within the 12 months following December 31, 2018 totaled $149.7 million in value.

We have adopted the new revenue recognition standard ASC 606 effective January 1, 2018. This impacts the way we account for vehicle sales with a resale value guarantee and vehicles leased through our leasing partners, which now generally qualify to be accounted for as sales with a right of return. In addition, for certain vehicles sales with a resale value guarantee and vehicles leased through leasing partners prior to 2018, we have ceased recognizing lease revenue starting in 2018 and record the associated cumulative adjustment to equity under the modified retrospective approach.

Vehicle deliveries with the resale value guarantee do not impact our near-term cash flows and liquidity, since we receive the full amount of cash for the vehicle sales price at delivery. While we do not assume any credit risk related to the customer, if a customer exercises the option to return the vehicle to us, we are exposed to liquidity risk that the resale value of vehicles under these programs may be lower than our guarantee, or the volume of vehicles returned to us may be higher than our estimates or we may be unable to resell the used vehicles in a timely manner, all of which could adversely impact our cash flows. To date, we have only had an insignificant number of customers who exercised their resale value guarantees and returned their vehicles to us. Based on current market demand for our vehicles, we estimate the resale prices for our vehicles will continue to be above our resale value guarantee amounts, but resale prices may inherently fluctuate depending on various factors such as supply and demand of our used vehicles, economic cycles and the pricing of new vehicles. Should market values of our vehicles or customer demand decrease, these estimates may be impacted materially.

We currently offer Model S and Model X leasing directly through our local subsidiaries in the U.S. and Canada. We also offer leasing through leasing partners in certain jurisdictions. Leasing through our captive financing entities and our leasing partners exposes us to residual value risk. In addition, for leases offered directly from our captive financing entities, we assume customer credit risk. We plan to continue expanding our financing offerings, including our lease financing options and the financial sources to support them, and to support the overall financing needs of our customers. To the extent that we are unable to arrange such options for our customers on terms that are attractive, our sales, financial results and cash flows could be negatively impacted.

Energy Generation and Storage Financing Options

We offer our customers the choice to either purchase and own solar energy systems or to purchase the energy that our solar energy systems produce through various contractual arrangements. These contractual arrangements include long-term leases and PPAs. In both structures, we install our solar energy systems at our customer's premises and charge the customer a monthly fee. In the lease structure, this monthly payment is fixed with a minimum production guarantee. In the PPA structure, we charge customers a fee per kilowatt-hour, or kWh, based on the amount of electricity the solar energy system actually produces. The leases and PPAs are typically for 20 years with a renewal option, and the specified monthly fees are subject to annual escalations.

For customers who want to purchase and own solar energy systems, we also offer solar loans, whereby a third-party lender provides financing directly to a qualified customer to enable the customer to purchase and own a solar energy system designed, installed and serviced by us. We enter into a standard solar energy system sale and installation agreement with the customer. Separately, the customer enters into a loan agreement with a third-party lender, who finances the full purchase price. We are not a party to the loan agreement between the customer and the third-party lender, and the third-party lender has no recourse against us with respect to the loan.

Gigafactory 1

We continue to develop Gigafactory 1 as a facility where we work together with our suppliers to integrate production of battery material, cells, modules, battery packs and drive units in one location for vehicles and energy storage products. We also continue to invest in the future expansion of Gigafactory 1 and in additional production capacity there. For example, we have announced that we will likely manufacture Model Y at Gigafactory 1.

Panasonic has partnered with us on Gigafactory 1 with investments in the production equipment that it uses to manufacture and supply us with battery cells. Under our arrangement with Panasonic, we plan to purchase the full output from their production equipment at negotiated prices. As these terms convey to us the right to use, as defined in ASC 840, Leases, their production equipment, we consider them to be leased assets when production commences. This results in us recording the value of their production equipment within property, plant and equipment, net, on the consolidated balance sheets with a corresponding liability recorded to financing obligations. For all suppliers and partners for which we plan to purchase the full output from their production equipment located at Gigafactory 1, we will apply similar accounting. During the year ended December 31, 2018, we recorded $766.6 million on the consolidated balance sheet.

While we currently believe that our progress at Gigafactory 1 will allow us to reach our production targets, our ultimate ability to do so will require us to resolve the types of challenges that are typical of a production ramp. For example, we have in the past experienced bottlenecks in the assembly of battery modules at Gigafactory 1, which negatively affected our production of Model 3. While we continue to resolve such issues at Gigafactory 1 as they arise, given the size and complexity of this undertaking, it is possible that future events could result in the cost of building and operating Gigafactory 1 exceeding our current expectations and Gigafactory 1 taking longer to expand than we currently anticipate.

Gigafactory 2

We have an agreement with the SUNY Foundation for the construction of a factory with the intended capacity to produce at least 1.0 GW of solar products annually in Buffalo, New York, referred to as Gigafactory 2. In December 2016, we entered into an agreement with Panasonic under which it manufactures custom PV cells and modules for us, primarily at Gigafactory 2, and we purchase certain quantities of PV cells and modules from Panasonic during the 10-year term.

The terms of our agreement with the SUNY Foundation require us to comply with a number of covenants, and any failure to comply with these covenants could obligate us to pay significant amounts to the SUNY Foundation and result in termination of the agreement. Although we remain on track with our progress at Gigafactory 2, our expectations as to the cost of building the facility, acquiring manufacturing equipment and supporting our manufacturing operations may prove incorrect, which could subject us to significant expenses to achieve the desired benefits.

Gigafactory Shanghai

We are constructing Gigafactory Shanghai in order to significantly increase the affordability of Model 3 for customers in China by reducing transportation and manufacturing costs and eliminating certain tariffs on vehicles imported from the U.S. We broke ground in January 2019, and subject to a number of uncertainties, including regulatory approval, supply chain constraints, and the pace of installing production equipment and bringing the factory online, we expect to begin production of certain trims of Model 3 at Gigafactory Shanghai by the end of 2019. We expect much of the investment in Gigafactory Shanghai to be provided through local debt financing, supported by limited direct capital expenditures by us. Moreover, we are targeting the capital expenditures per unit of production capacity at this factory

to be less than that of our Model 3 production at the Tesla Factory, from which we have drawn learnings that should allow us to simplify our manufacturing layout and processes at Gigafactory Shanghai.

Other Manufacturing

We continue to expand production capacity at our existing facilities and construct our planned facilities, and continually explore additional production capacity internationally.

Critical Accounting Policies and Estimates

The consolidated financial statements are prepared in accordance with accounting principles generally accepted in the U.S. ("GAAP"). The preparation of the consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues, costs and expenses and related disclosures. We base our estimates on historical experience, as appropriate, and on various other assumptions that we believe to be reasonable under the circumstances. Changes in the accounting estimates are reasonably likely to occur from period to period. Accordingly, actual results could differ significantly from the estimates made by our management. We evaluate our estimates and assumptions on an ongoing basis. To the extent that there are material differences between these estimates and actual results, our future financial statement presentation, financial condition, results of operations and cash flows will be affected. We believe that the following critical accounting policies involve a greater degree of judgment and complexity than our other accounting policies. Accordingly, these are the policies we believe are the most critical to understanding and evaluating the consolidated financial condition and results of operations.

Revenue Recognition

Adoption of new revenue standard

On January 1, 2018, we adopted ASC 606, Revenue from Contracts with Customers, ("new revenue standard") using the modified retrospective method. The new revenue standard had a material impact in our consolidated financial statements. For further discussion, refer to Note 2, Summary of Significant Accounting Policies, to the consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

Automotive Segment

Automotive Sales Revenue

Automotive Sales without Resale Value Guarantee

Automotive sales revenue includes revenues related to deliveries of new vehicles, and specific other features and services that meet the definition of a performance obligation under the new revenue standard, including access to our Supercharger network, internet connectivity, Autopilot, full self-driving and over-the-air software updates. We recognize revenue on automotive sales upon delivery to the customer, which is when the control of a vehicle transfers. Payments are typically received at the point control transfers or in accordance with payment terms customary to the business. Other features and services such as access to our Supercharger network, internet connectivity and over-the-air software updates are provisioned upon control transfer of a vehicle and recognized over time on a straight-line basis as we have a stand-ready obligation to deliver such services to the customer. We recognize revenue related to these other features and services over the performance period, which is generally the expected ownership life of the vehicle or the eight-year life of the vehicle. Revenue related to Autopilot and full self-driving features is recognized when functionality is delivered to the customer. For our obligations related to automotive sales, we estimate standalone selling price by considering costs used to develop and deliver the service, third-party pricing of similar options and other information that may be available.

At the time of revenue recognition, we reduce the transaction price and record a reserve against revenue for estimated variable consideration related to future product returns. Such estimates are based on historical experience and are immaterial in all periods presented. In addition, any fees that are paid or payable by us to a customer's lender when we arrange the financing are recognized as an offset against automotive sales revenue.

Costs to obtain a contract mainly relate to commissions paid to our sales personnel for the sale of vehicles. Commissions are not paid on other obligations such as access to our Supercharger network, internet connectivity, Autopilot, full self-driving and over-the-air software updates. As our contract costs related to automotive sales are typically fulfilled within one year, the costs to obtain a contract are expensed as incurred. Amounts billed to customers related to shipping and handling are classified as automotive revenue, and we have elected to recognize the cost for freight and shipping when control over vehicles, parts, or accessories have transferred to the customer as an expense in cost of revenues. Our policy is to exclude taxes collected from a customer from the transaction price of automotive contracts.

Automotive Sales with Resale Value Guarantee

We offer resale value guarantees or similar buy-back terms to certain international customers who purchase vehicles and who finance their vehicles through one of our specified commercial banking partners. We also offer resale value guarantees in connection with automotive sales to certain leasing partners. Under these programs, we receive full payment for the vehicle sales price at the time of delivery and our counterparty has the option of selling their vehicle back to us during the guarantee period, which currently is generally at the end of the term of the applicable loan or financing program, for a pre-determined resale value.

With the exception of two programs which are discussed within the Automotive Leasing section, we now recognize revenue when control transfers upon delivery to customers in accordance with the new revenue standard as a sale with a right of return as we do not believe the customer has a significant economic incentive to exercise the resale value guarantee provided to them. The process to determine whether there is a significant economic incentive includes a comparison of a vehicle's estimated market value at the time the option is exercisable with the guaranteed resale value to determine the customer's economic incentive to exercise. The performance obligations and the pattern of recognizing automotive sales with resale value guarantees are consistent with automotive sales without resale value guarantees with the exception of our estimate for sales return reserve. Sales return reserves for automotive sales with resale value guarantees are estimated based on historical experience plus consideration for expected future market values. The two programs that are still being recorded as operating leases are discussed in further detail below in Vehicle Sales to Leasing Partners with a Resale Value Guarantee and a Buyback Option and Vehicle Sales to Customers with a Resale Value Guarantee where Exercise is Probable.

Prior to the adoption of the new revenue standard, all transactions with resale value guarantees were recorded as operating leases. The amount of sale proceeds equal to the resale value guarantee was deferred until the guarantee expired or was exercised. For certain transactions that were considered interest bearing collateralized borrowings as required under ASC 840, Leases, we also accrued interest expense based on our borrowing rate. The remaining sale proceeds were deferred and recognized on a straight-line basis over the stated guarantee period to automotive leasing revenue. The guarantee period expired at the earlier of the end of the guarantee period or the pay-off of the initial loan. We capitalized the cost of these vehicles on the consolidated balance sheet as operating lease vehicles, net, and depreciated their value, less estimated residual value, to cost of automotive leasing revenue over the same period.

In cases where our counterparty retained ownership of the vehicle at the end of the guarantee period, the resale value guarantee liability and any remaining deferred revenue balances related to the vehicle were settled to automotive leasing revenue, and the net book value of the leased vehicle was expensed to cost of automotive leasing revenue. If our counterparty returned the vehicle to us during the guarantee period, we purchased the vehicle from our counterparty in an amount equal to the resale value guarantee and settled any remaining deferred balances to automotive leasing revenue, and we reclassified the net book value of the vehicle on the consolidated balance sheet to used vehicle inventory.

Automotive Regulatory Credits

California and certain other states have laws in place requiring vehicle manufacturers to ensure that a portion of the vehicles delivered for sale in that state during each model year are zero-emission vehicles. These laws and regulations provide that a manufacturer of zero-emission vehicles may earn regulatory credits ("ZEV credits") and may sell excess credits to other manufacturers who apply such credits to comply with these regulatory requirements. Similar regulations exist at the federal level that require compliance related to greenhouse gas ("GHG") emissions and also allow for the sale of excess credits by one manufacturer to other manufacturers. As a manufacturer solely of zero-emission vehicles, we have earned emission credits, such as ZEV and GHG credits, on our vehicles, and we expect to continue to earn these credits in the future. We enter into contractual agreements with third-parties to

purchase our regulatory credits. Payments for regulatory credits are typically received at the point control transfers to the customer, or in accordance with payment terms customary to the business. We recognize revenue on the sale of regulatory credits at the time control of the regulatory credits is transferred to the purchasing party as automotive revenue in the consolidated statement of operations.

Automotive Leasing Revenue

Automotive leasing revenue includes revenue recognized under lease accounting guidance for our direct leasing programs as well as the two programs with resale value guarantees which continue to qualify for operating lease treatment. Prior to the adoption of the new revenue standard, all programs with resale value guarantees were accounted for as operating leases.

Direct Vehicle Leasing Program

We have outstanding leases under our direct vehicle leasing programs in certain locations in the U.S., Canada and Europe. Currently, the direct vehicle leasing program is only offered for new leases to qualified customers in the U.S. and Canada. Qualifying customers are permitted to lease a vehicle directly from Tesla for up to 48 months. At the end of the lease term, customers have the option of either returning the vehicle to us or purchasing it for a pre-determined residual value. We account for these leasing transactions as operating leases. We record leasing revenues to automotive leasing revenue on a straight-line basis over the contractual term, and we record the depreciation of these vehicles to cost of automotive leasing revenue.

We capitalize shipping costs and initial direct costs such as the incremental cost of contract administration, referral fees and sales commissions from the origination of automotive lease agreements as an element of operating lease vehicles, net, and subsequently amortize these costs over the term of the related lease agreement. Our policy is to exclude taxes collected from a customer from the transaction price of automotive contracts.

Vehicle Sales to Leasing Partners with a Resale Value Guarantee and a Buyback Option

We offer buyback options in connection with automotive sales with resale value guarantees to certain leasing partner sales in the United States. These transactions entail a transfer of leases, which we have originated with an end-customer, to our leasing partner. As control of the vehicles has not been transferred in accordance with the new revenue standard, these transactions continue to be accounted for as interest bearing collateralized borrowings in accordance with ASC 840, Leases. Under this program, cash is received for the full price of the vehicle and the collateralized borrowing value is generally recorded within resale value guarantees and the customer upfront deposit is recorded within deferred revenue. We amortize the deferred revenue amount to automotive leasing revenue on a straight-line basis over the option period and accrue interest expense based on our borrowing rate. We capitalize vehicles under this program to operating lease vehicles, net, on the consolidated balance sheet, and we record depreciation from these vehicles to cost of automotive leasing revenue during the period the vehicle is under a lease arrangement. Cash received for these vehicles, net of revenue recognized during the period, is classified as collateralized lease (repayments) borrowings within cash flows from financing activities in the consolidated statement of cash flows.

At the end of the lease term, we settle our liability in cash by either purchasing the vehicle from the leasing partner for the buyback option amount or paying a shortfall to the option amount the leasing partner may realize on the sale of the vehicle. Any remaining balances within deferred revenue and resale value guarantee will be settled to automotive leasing revenue. In cases where the leasing partner retains ownership of the vehicle after the end of our option period, we expense the net value of the leased vehicle to cost of automotive leasing revenue.

On a quarterly basis, we assess the estimated market values of vehicles under our buyback options program to determine if we have sustained a loss on any of these contracts. As we accumulate more data related to the buyback values of our vehicles or as market conditions change, there may be material changes to their estimated values, although we have not experienced any material losses during any period to date.

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Vehicle Sales to Customers with a Resale Value Guarantee where Exercise is Probable

For certain international programs where we have offered resale value guarantees to certain customers who purchased vehicles and where we expect the customer has a significant economic incentive to exercise the resale value guarantee provided to them, we continue to recognize these transactions as operating leases. The process to determine whether there is a significant economic incentive includes a comparison of a vehicle's estimated market value at the time the option is exercisable with the guaranteed resale value to determine the customer's economic incentive to exercise. We have not sold any vehicles under this program since the first half of 2017 and all current period activity relates to the exercise or cancellation of active transactions. The amount of sale proceeds equal to the resale value guarantee is deferred until the guarantee expires or is exercised. The remaining sale proceeds are deferred and recognized on a straight-line basis over the stated guarantee period to automotive leasing revenue. The guarantee period expires at the earlier of the end of the guarantee period or the pay-off of the initial loan. We capitalize the cost of these vehicles on the consolidated balance sheet as operating lease vehicles, net, and depreciate their value, less salvage value, to cost of automotive leasing revenue over the same period.

In cases where a customer retains ownership of a vehicle at the end of the guarantee period, the resale value guarantee liability and any remaining deferred revenue balances related to the vehicle are settled to automotive leasing revenue, and the net book value of the leased vehicle is expensed to cost of automotive leasing revenue. If a customer returns the vehicle to us during the guarantee period, we purchase the vehicle from the customer in an amount equal to the resale value guarantee and settle any remaining deferred balances to automotive leasing revenue, and we reclassify the net book value of the vehicle on the consolidated balance sheet to used vehicle inventory.

Services and Other Revenue

Services and other revenue consists of non-warranty after-sales vehicle services, sales of used vehicles, sales of electric vehicle components and systems to other manufacturers, retail merchandise, and sales by our acquired subsidiaries to third party customers. There were no significant changes to the timing or amount of revenue recognition as a result of our adoption of the new revenue standard.

Revenues related to repair and maintenance services are recognized over time as services are provided and extended service plans are recognized over the performance period of the service contract as the obligation represents a stand-ready obligation to the customer. We sell used vehicles, services, service plans, vehicle components and merchandise separately and thus use standalone selling prices as the basis for revenue allocation to the extent that these items are sold in transactions with other performance obligations. Payment for used vehicles, services, and merchandise are typically received at the point when control transfers to the customer or in accordance with payment terms customary to the business. Payments received for prepaid plans are refundable upon customer cancellation of the related contracts and are included within customer deposits on the consolidated balance sheet.

Energy Generation and Storage Segment

Energy Generation and Storage Sales

Energy generation and storage revenues consists of the sale of solar energy systems and energy storage systems to residential, small commercial, and large commercial and utility grade customers. Sales of solar energy systems to residential and small scale commercial customers consist of the engineering, design, and installation of the system. Post-installation, residential and small scale commercial customers receive a proprietary monitoring system that captures and displays historical energy generation data. Residential and small scale commercial customers pay the full purchase price of the solar energy system upfront. Revenue for the design and installation obligation is recognized when control transfers, which is when we install a solar energy system and the system passes inspection by the utility

or the authority having jurisdiction. Revenue for the monitoring service is recognized ratably as a stand-ready obligation over the warranty period of the solar energy system. Sales of energy storage systems to residential and small scale commercial customers consist of the installation of the energy storage system and revenue is recognized when control transfers, which is when the product has been delivered or, if we are performing installation, when installed and accepted by the customer. Payment for such storage systems is made upon invoice or in accordance with payment terms customary to the business.

For large commercial and utility grade solar energy system and energy storage system sales which consist of the engineering, design, and installation of the system, customers make milestone payments that are consistent with contract-specific phases of a project. Revenue from such contracts is recognized over time using percentage of completion method based on cost incurred as a percentage of total estimated contract costs. Certain large-scale commercial and utility grade solar energy system and energy storage system sales also include operations and maintenance service which are negotiated with the design and installation contracts and are thus considered to be a combined contract with the design and installation service. For certain large commercial and utility grade solar energy systems and energy storage systems where percentage of completion method does not apply, revenue is recognized when control transfers, which is when the product has been delivered to the customer for energy storage systems and when the project has received permission to operate from the utility for solar energy systems. Operations and maintenance service revenue is recognized ratably over the respective contract term. Customer payments for such services are usually paid annually or quarterly in advance.

In instances where there are multiple performance obligations in a single contract, we allocate the consideration to the various obligations in the contract based on the relative standalone selling price method. Standalone selling prices are estimated based on estimated costs plus margin or using market data for comparable products. Costs incurred on the sale of residential installations before the solar energy systems are completed are included as work in process within inventory in the consolidated balance sheets. However, any fees that are paid or payable by us to a solar loan lender would be recognized as an offset against revenue. Costs to obtain a contract relate mainly to commissions paid to our sales personnel related to the sale of solar energy systems and energy storage systems. As our contract costs related to solar energy system and energy storage system sales are typically fulfilled within one year, the costs to obtain a contract are expensed as incurred.

As part of our solar energy system and energy storage system contracts, we may provide the customer with performance guarantees that warrant that the underlying system will meet or exceed the minimum energy generation or retention requirements specified in the contract. In certain instances, we may receive a bonus payment if the system performs above a specified level. Conversely, if a solar energy system or energy storage system does not meet the performance guarantee requirements, we may be required to pay liquidated damages. Other forms of variable consideration related to our large commercial and utility grade solar energy system and energy storage system contracts include variable customer payments that will be made based on our energy market participation activities. Such guarantees and variable customer payments represent a form of variable consideration and are estimated at contract inception at their most likely amount and updated at the end of each reporting period as additional performance data becomes available. Such estimates are included in the transaction price only to the extent that it is probable a significant reversal of revenue will not occur.

We record as deferred revenue any non-refundable amounts that are collected from customers related to fees charged for prepayments and remote monitoring service and operations and maintenance service, which is recognized as revenue ratably over the respective customer contract term.

Energy Generation and Storage Leasing

For revenue arrangements where we are the lessor under operating lease agreements for energy generation and storage products, we record lease revenue from minimum lease payments, including upfront rebates and incentives earned from such systems, on a straight-line basis over the life of the lease term, assuming all other revenue recognition criteria have been met. The difference between the payments received and the revenue recognized is recorded as deferred revenue on the consolidated balance sheet.

For solar energy systems where customers purchase electricity from us under PPAs, we have determined that these agreements should be accounted for as operating leases pursuant to ASC 840. Revenue is recognized based on the

amount of electricity delivered at rates specified under the contracts, assuming all other revenue recognition criteria are met.

We record as deferred revenue any amounts that are collected from customers, including lease prepayments, in excess of revenue recognized and operations and maintenance service, which is recognized as revenue ratably over the respective customer contract term. Deferred revenue also includes the portion of rebates and incentives received from utility companies and various local and state government agencies, which is recognized as revenue over the lease term.

We capitalize initial direct costs from the origination of solar energy system leases or PPAs, which include the incremental cost of contract administration, referral fees and sales commissions, as an element of solar energy systems, leased and to be leased, net, and subsequently amortize these costs over the term of the related lease or PPA.

Inventory Valuation

Inventories are stated at the lower of cost or net realizable value. Cost is computed using standard cost for vehicles and energy storage products, which approximates actual cost on a first-in, first-out basis. In addition, cost for solar energy systems is recorded using actual cost. We record inventory write-downs for excess or obsolete inventories based upon assumptions about on current and future demand forecasts. If our inventory on-hand is in excess of our future demand forecast, the excess amounts are written-off.

We also review our inventory to determine whether its carrying value exceeds the net amount realizable upon the ultimate sale of the inventory. This requires us to determine the estimated selling price of our vehicles less the estimated cost to convert the inventory on-hand into a finished product. Once inventory is written-down, a new, lower cost basis for that inventory is established and subsequent changes in facts and circumstances do not result in the restoration or increase in that newly established cost basis.

Should our estimates of future selling prices or production costs change, additional and potentially material increases to this reserve may be required. A small change in our estimates may result in a material charge to our reported financial results.

Warranties

We provide a manufacturer’s warranty on all new and used vehicles, production powertrain components and systems and energy storage products we sell. In addition, we also provide a warranty on the installation and components of the solar energy systems we sell for periods typically between 10 to 30 years. We accrue a warranty reserve for the products sold by us, which includes our best estimate of the projected costs to repair or replace items under warranties and recalls when identified. These estimates are based on actual claims incurred to date and an estimate of the nature, frequency and costs of future claims. These estimates are inherently uncertain given our relatively short history of sales, and changes to our historical or projected warranty experience may cause material changes to the warranty reserve in the future. The warranty reserve does not include projected warranty costs associated with our vehicles subject to lease accounting and our solar energy systems under lease contracts or PPAs, as the costs to repair these warranty claims are expensed as incurred. The portion of the warranty reserve expected to be incurred within the next 12 months is included within accrued liabilities and other while the remaining balance is included within other long-term liabilities on the consolidated balance sheet. Due to the adoption of the new revenue standard, automotive sales with resale value guarantees that were previously recorded within operating lease assets require a corresponding warranty accrual. Warranty expense is recorded as a component of cost of revenues in the consolidated statements of operations.

Stock-Based Compensation

We use the fair value method of accounting for our stock options and restricted stock units (“RSUs”) granted to employees and our employee stock purchase plan (the “ESPP”) to measure the cost of employee services received in exchange for the stock-based awards. The fair value of stock option awards with only service conditions and ESPP is estimated on the grant or offering date using the Black-Scholes option-pricing model. The Black-Scholes option-pricing model requires inputs such as the risk-free interest rate, expected term and expected volatility. These inputs are subjective and generally require significant judgment. The fair value of RSUs is measured on the grant date based on the closing fair market value of our common stock. The resulting cost is recognized over the period during

which an employee is required to provide service in exchange for the awards, usually the vesting period, which is generally four years for stock options and RSUs and six months for the ESPP. Stock-based compensation expense is recognized on a straight-line basis, net of actual forfeitures in the period (prior to 2017, net of estimated projected forfeitures).

For performance-based awards, stock-based compensation expense is recognized over the expected performance achievement period of individual performance milestones when the achievement of each individual performance milestone becomes probable. For performance-based awards with a vesting schedule based entirely on the attainment of both performance and market conditions, stock-based compensation expense is recognized for each pair of performance and market conditions over the longer of the expected achievement period of the performance and market conditions, beginning at the point in time that the relevant performance condition is considered probable of achievement. The fair value of such awards is estimated on the grant date using Monte Carlo simulations.

As we accumulate additional employee stock-based awards data over time and as we incorporate market data related to our common stock, we may calculate significantly different volatilities and expected lives, which could materially impact the valuation of our stock-based awards and the stock-based compensation expense that we will recognize in future periods. Stock-based compensation expense is recorded in cost of revenues, research and development expense and selling, general and administrative expense in the consolidated statements of operations.

Income Taxes

We are subject to federal and state taxes in the U.S. and in many foreign jurisdictions. Significant judgment is required in determining our provision for income taxes, our deferred tax assets and liabilities and any valuation allowance recorded against our net deferred tax assets. We make these estimates and judgments about our future taxable income that are based on assumptions that are consistent with our future plans. Tax laws, regulations, and administrative practices may be subject to change due to economic or political conditions including fundamental changes to the tax laws applicable to corporate multinationals. The U.S., many countries in the European Union and a number of other countries are actively considering changes in this regard. As of December 31, 2018, we had recorded a full valuation allowance on our net U.S. deferred tax assets because we expect that it is more likely than not that our U.S. deferred tax assets will not be realized in the foreseeable future. Should the actual amounts differ from our estimates, the amount of our valuation allowance could be materially impacted.

Furthermore, significant judgment is required in evaluating our tax positions. In the ordinary course of business, there are many transactions and calculations for which the ultimate tax settlement is uncertain. As a result, we recognize the effect of this uncertainty on our tax attributes based on our estimates of the eventual outcome. These effects are recognized when, despite our belief that our tax return positions are supportable, we believe that it is more likely than not that those positions may not be fully sustained upon review by tax authorities. We are required to file income tax returns in the U.S. and various foreign jurisdictions, which requires us to interpret the applicable tax laws and regulations in effect in such jurisdictions. Such returns are subject to audit by the various federal, state and foreign taxing authorities, who may disagree with respect to our tax positions. We believe that our consideration is adequate for all open audit years based on our assessment of many factors, including past experience and interpretations of tax law. We review and update our estimates in light of changing facts and circumstances, such as the closing of a tax audit, the lapse of a statute of limitations or a change in estimate. To the extent that the final tax outcome of these matters differs from our expectations, such differences may impact income tax expense in the period in which such determination is made. The eventual impact on our income tax expense depends in part if we still have a valuation allowance recorded against our deferred tax assets in the period that such determination is made.

On December 22, 2017, the 2017 Tax Cuts and Jobs Act (“Tax Act”) was enacted into law making significant changes to the Internal Revenue Code. Changes include, but are not limited to, a federal corporate tax rate decrease from 35% to 21% for tax years beginning after December 31, 2017, the transition of U.S. international taxation from a worldwide tax system to a territorial system and a one-time transition tax on the mandatory deemed repatriation of foreign earnings. We were required to recognize the effect of the tax law changes in the period of enactment, such as re-measuring our U.S. deferred tax assets and liabilities as well as reassessing the net realizability of our deferred tax assets and liabilities. The Tax Act did not give rise to any material impact on the consolidated balance sheets and

consolidated statements of operations due to our historical worldwide loss position and the full valuation allowance on our net U.S. deferred tax assets.

In December 2017, the Securities and Exchange Commission staff issued Staff Accounting Bulletin No. 118, Income Tax Accounting Implications of the Tax Cuts and Jobs Act ("SAB 118"), which allowed us to record provisional amounts during a measurement period not to extend beyond one year from the enactment date. As such, in accordance with SAB 118, we completed our analysis during the fourth quarter of 2018 considering current legislation and guidance resulting in no material adjustments from the provisional amounts recorded during the prior year.

Principles of Consolidation

The consolidated financial statements reflect our accounts and operations and those of our subsidiaries in which we have a controlling financial interest. In accordance with the provisions of ASC 810, Consolidation, we consolidate any variable interest entity ("VIE") of which we are the primary beneficiary. We form VIEs with our financing fund investors in the ordinary course of business in order to facilitate the funding and monetization of certain attributes associated with our solar energy systems and leases under our direct vehicle leasing programs. The typical condition for a controlling financial interest ownership 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 controlling voting interests. ASC 810 requires a variable interest holder to consolidate a VIE if that party has the power to direct the activities of the VIE that most significantly impact the VIE's economic performance and the obligation to absorb losses of the VIE that could potentially be significant to the VIE or the right to 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 determined that we are the primary beneficiary of a number of VIEs. We evaluate our relationships with all the VIEs on an ongoing basis to ensure that we continue to be the primary beneficiary. All intercompany transactions and balances have been eliminated upon consolidation.

Noncontrolling Interests and Redeemable Noncontrolling Interests

Noncontrolling interests and redeemable noncontrolling interests represent third-party interests in the net assets under certain funding arrangements, or funds, that we enter into to finance the costs of solar energy systems and vehicles under operating leases. We have determined that the contractual provisions of the funds represent substantive profit sharing arrangements. We have further determined that the appropriate methodology for calculating the noncontrolling interest and redeemable noncontrolling interest balances that reflects the substantive profit sharing arrangements is a balance sheet approach using the hypothetical liquidation at book value ("HLBV") method. We, therefore, determine the amount of the noncontrolling interests and redeemable noncontrolling interests in the net assets of the funds at each balance sheet date using the HLBV method, which is presented on the consolidated balance sheet as noncontrolling interests in subsidiaries and redeemable noncontrolling interests in subsidiaries. Under the HLBV method, the amounts reported as noncontrolling interests and redeemable noncontrolling interests in the consolidated balance sheet represent the amounts the third-parties would hypothetically receive at each balance sheet date under the liquidation provisions of the funds, assuming the net assets of the funds were liquidated at their recorded amounts determined in accordance with GAAP and with tax laws effective at the balance sheet date and distributed to the third-parties. The third-parties' interests in the results of operations of the funds are determined as the difference in the noncontrolling interest and redeemable noncontrolling interest balances in the consolidated balance sheets between the start and end of each reporting period, after taking into account any capital transactions between the funds and the third-parties. However, the redeemable noncontrolling interest balance is at least equal to the redemption amount. The redeemable noncontrolling interest balance is presented as temporary equity in the mezzanine section of the consolidated balance sheet since these third-parties have the right to redeem their interests in the funds for cash or other assets.

Business Combinations

We account for business acquisitions under ASC 805, Business Combinations. The total purchase consideration for an acquisition is measured as the fair value of the assets given, equity instruments issued and liabilities assumed at the acquisition date. Costs that are directly attributable to the acquisition are expensed as incurred. Identifiable assets (including intangible assets), liabilities assumed (including contingent liabilities) and noncontrolling interests in an acquisition are measured initially at their fair values at the acquisition date. We recognize goodwill if the fair value of the total purchase consideration and any noncontrolling interests is in excess of the net fair value of the identifiable assets acquired and the liabilities assumed. We recognize a bargain purchase gain within other income (expense), net, on the consolidated statement of operations if the net fair value of the identifiable assets acquired and the liabilities assumed is in excess of the fair value of the total purchase consideration and any noncontrolling interests. We include the results of operations of the acquired business in the consolidated financial statements beginning on the acquisition date.

When determining such fair values, we make significant estimates and assumptions. Critical estimates include, but are not limited to, future expected cash flows from the underlying assets and discount rates. Our estimate of fair values is based on assumptions believed to be reasonable but that are inherently uncertain and unpredictable. As a result, actual results may differ from our estimates. Furthermore, our estimates might change as additional information becomes available, as more fully discussed in Note 3, Business Combinations, included elsewhere in this Annual Report on Form 10-K.

Results of Operations

Revenues

	Year Ended December 31,			2018 vs. 2017 Change		2017 vs. 2016 Change	
(Dollars in thousands)	2018	2017	2016	$	%	$	%
Automotive sales	$17,631,522	$8,534,752	$5,589,007	$9,096,770	107%	$2,945,745	53 %
Automotive leasing	883,461	1,106,548	761,759	(223,087)	-20 %	344,789	45 %
Total automotive revenues	18,514,983	9,641,300	6,350,766	8,873,683	92 %	3,290,534	52 %
Services and other	1,391,041	1,001,185	467,972	389,856	39 %	533,213	114%
Total automotive & services and other segment revenue	19,906,024	10,642,485	6,818,738	9,263,539	87 %	3,823,747	56 %
Energy generation and storage segment revenue	1,555,244	1,116,266	181,394	438,978	39 %	934,872	515%
Total revenues	$21,461,268	$11,758,751	$7,000,132	$9,702,517	83 %	$4,758,619	68 %

Automotive & Services and Other Segment

Automotive sales revenue includes revenues related to sale of new Model S, Model X and Model 3 vehicles, including access to our Supercharger network, internet connectivity, Autopilot, full self-driving and over-the-air software updates, as well as sales of regulatory credits to other automotive manufacturers. Our revenue from non-ZEV regulatory credits generally follows our production and delivery trends as we have long-term contracts with existing customers for the sale of these credits. However, as we do not have long-term contracts for ZEV credit sales, revenue from sale of ZEV credits fluctuate by quarter depending on when a contract is executed with a buyer. For example, our revenue from ZEV credit sales in the three months ended December 31, 2017 was $179.1 million while it was $0 in the three months ended June 30, 2018.

Automotive leasing revenue includes the amortization of revenue for Model S and Model X vehicles under direct lease agreements as well as those sold with resale value guarantees accounted for as operating leases under lease accounting. We do not yet offer leasing for Model 3 vehicles.

Services and other revenue consists of non-warranty after-sales vehicle services, sales of used vehicles, sales of electric vehicle components and systems to other manufacturers, retail merchandise, and sales by our acquired subsidiaries to third party customers.

2018 Compared to 2017

Automotive sales revenue increased $9.10 billion, or 107%, in the year ended December 31, 2018 as compared to the year ended December 31, 2017, primarily due to an increase of approximately 144,330 Model 3 deliveries from our significant production ramp in the year ended December 31, 2018, delivered at average selling prices that remained relatively consistent year-over-year. Additionally, we recognized $1.40 billion of additional automotive sales revenue due to the adoption of the new revenue standard and an increase of $58.3 million in sales of regulatory credits to $418.6 million in the year ended December 31, 2018. ZEV credits sales were $103.4 million and non-ZEV regulatory credits sales were $315.2 million in the year ended December 31, 2018, compared to $279.7 million ZEV credit sales and $80.6 million in non-ZEV regulatory credit sales in the year ended December 31, 2017. The growth in non-ZEV regulatory credits year-over-year was generally consistent with the delivery volume growth. The above increases in revenue were offset by a decrease of approximately 3,240 Model S and Model X deliveries during the year ended December 31, 2018, excluding the impact of adoption of the new revenue standard, at average selling prices that remained relatively consistent as compared to the year ended December 31, 2017.

Automotive leasing revenue decreased $223.1 million, or 20%, in the year ended December 31, 2018 as compared to the year ended December 31, 2017. The decrease was primarily due to a downward adjustment of $832.7 million from the adoption of the new revenue standard, partially offset by an increase in cumulative vehicles under our direct vehicle leasing program and an increase in the number of vehicles under leasing programs where our counterparty has retained ownership of the vehicle during or at the end of the guarantee period when compared to the year ended December 31, 2017. When our counterparty retains ownership, any remaining balances within deferred revenue and resale value guarantee are settled to automotive leasing revenue.

Services and other revenue increased $389.9 million, or 39%, in the year ended December 31, 2018 as compared to the year ended December 31, 2017. The increase was primarily due to an increase in used vehicle sales from an increased volume of trade-in vehicles, partially offset by lower average selling prices for used vehicles sales due to an increase in trade-ins of relatively lower priced non-Tesla vehicles in the year ended December 31, 2018. Additionally, there was an increase in non-warranty maintenance services revenue as our fleet continues to grow. These increases were partially offset by a decrease in powertrain sales to another automobile manufacturer as we wound down the program in 2017.

2017 Compared to 2016

Automotive sales revenue increased $2.95 billion, or 53%, in the year ended December 31, 2017 compared to the year ended December 31, 2016, primarily related to a 58% increase in deliveries to 80,060 vehicles resulting from increased sales of Model S and Model X, at average selling prices that remained relatively consistent as compared to the prior period, as well as sales of 1,764 Model 3 vehicles since its launch in the third quarter of 2017. Additionally, sales of regulatory credits increased by $58.0 million to $360.3 million in the year ended December 31, 2017. ZEV credits sales were $279.7 million and non-ZEV regulatory credits sales were $80.6 million in the year ended December 31, 2017, compared to $215.4 million ZEV credit sales and $86.9 million in non-ZEV regulatory credit sales in the year ended December 31, 2016. The increases were partially offset by additional deferrals of Autopilot 2.0 revenue in the year ended December 31, 2017.

Automotive leasing revenue increased $344.8 million, or 45%, in the year ended December 31, 2017 compared to the year ended December 31, 2016. The increase was primarily due to an approximately 30% increase in the number of vehicles under leasing programs or programs with a resale value guarantee compared to the year ended December 31, 2016. In addition, during the year ended December 31, 2017, we recognized an increase of $23.4 million of automotive leasing revenue upon early payoff and expiration of resale value guarantees as compared to the year ended December 31, 2016.

Service and other revenue increased $533.2 million, or 114%, in the year ended December 31, 2017 compared to the year ended December 31, 2016. This was primarily due to an increase in used vehicle sales as a result of increased automotive sales as well as from the expansion of our trade-in program. Additionally, there was a $41.1 million increase from the inclusion of engineering service revenue from Grohmann Engineering GmbH (now Tesla Grohmann Automation GmbH, which we acquired on January 3, 2017, and a $68.4 million increase in non-warranty maintenance services revenue as our fleet continued to grow during the year ended December 31, 2017.

Energy Generation and Storage Segment

Energy generation and storage revenue includes sale of solar energy systems and energy storage products, leasing revenue from solar energy systems under operating leases and PPAs and the sale of solar energy systems incentives.

2018 Compared to 2017

Energy generation and storage revenue increased by $439.0 million, or 39%, in the year ended December 31, 2018 as compared to the year ended December 31, 2017. The increase was primarily due to increases in deployments of Powerpack, Powerwall, and cash and loan solar energy systems projects. The increase in Powerpack revenue was significant year-over-year due to increases in revenue recognized for commercial projects, most predominantly $81.2 million for the South Australia battery project. Additionally, we increased Powerwall production in the year ended December 31, 2018, which helped us to continue to work through our energy storage order backlog.

2017 Compared to 2016

Energy generation and storage revenue increased by $934.9 million, or 515%, in the year ended December 31, 2017 compared to the year ended December 31, 2016, predominantly due to the inclusion of the full-year of revenue from our solar business, which we gained by acquiring SolarCity on November 21, 2016.

Cost of Revenues and Gross Margin

	Year Ended December 31,			2018 vs. 2017 Change		2017 vs. 2016 Change	
(Dollars in thousands)	2018	2017	2016	$	%	$	%
Cost of revenues							
Automotive sales	$13,685,572	$6,724,480	$4,268,087	$6,961,092	104%	$2,456,393	58 %
Automotive leasing	488,425	708,224	481,994	(219,799)	-31 %	226,230	47 %
Total automotive cost of revenues	14,173,997	7,432,704	4,750,081	6,741,293	91 %	2,682,623	56 %
Services and other	1,880,354	1,229,022	472,462	651,332	53 %	756,560	160%
Total automotive & services and other segment cost of revenues	16,054,351	8,661,726	5,222,543	7,392,625	85 %	3,439,183	66 %
Energy generation and storage segment	1,364,896	874,538	178,332	490,358	56 %	696,206	390%
Total cost of revenues	$17,419,247	$9,536,264	$5,400,875	$7,882,983	83 %	$4,135,389	77 %
Gross profit total automotive	$4,340,986	$2,208,596	$1,600,685				
Gross margin total automotive	23 %	23 %	25 %				

Gross profit total automotive & services and other segment	$3,851,673		$1,980,759		$1,596,195	
Gross margin total automotive & services and other segment	19	%	19	%	23	%
Gross profit energy generation and storage segment	$190,348		$241,728		$3,062	
Gross margin energy generation and storage segment	12	%	22	%	2	%
Total gross profit	$4,042,021		$2,222,487		$1,599,257	
Total gross margin	19	%	19	%	23	%

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Automotive & Services and Other Segment

Cost of automotive sales revenue includes direct parts, material and labor costs, manufacturing overhead, including depreciation costs of tooling and machinery, shipping and logistic costs, vehicle connectivity costs, allocations of electricity and infrastructure costs related to our Supercharger network, and reserves for estimated warranty expenses. Cost of automotive sales revenues also includes adjustments to warranty expense and charges to write down the carrying value of our inventory when it exceeds its estimated net realizable value and to provide for obsolete and on-hand inventory in excess of forecasted demand.

Cost of automotive leasing revenue includes primarily the amortization of operating lease vehicles over the lease term, as well as warranty expenses recognized as incurred. Cost of automotive leasing revenue also includes vehicle connectivity costs and allocations of electricity and infrastructure costs related to our Supercharger network for vehicles under our leasing programs.

Costs of services and other revenue includes costs associated with providing non-warranty after-sales services, costs to acquire and certify used vehicles, and costs for retail merchandise. Cost of services and other revenue also includes direct parts, material and labor costs, manufacturing overhead associated with the sales of electric vehicle components and systems to other manufacturers and sales by our acquired subsidiaries to third party customers.

2018 Compared to 2017

Cost of automotive sales revenue increased $6.96 billion, or 104%, in the year ended December 31, 2018 as compared to the year ended December 31, 2017. The increase was primarily due to a significantly higher volume of Model 3 vehicles deliveries in 2018 and the recognition of $969.8 million of additional cost of automotive sales revenue due to the adoption of the new revenue standard. These increases were partially offset by significant reductions in Model 3 average costs per unit compared to the year ended December 31, 2017 primarily due to temporary under-utilization of manufacturing capacity at lower production volumes in 2017 and other cost efficiencies. Additionally, there were lower overall costs for Model S and Model X cash deliveries from approximately 3,240 fewer units delivered year-over-year and reductions in combined Model S and Model X average costs per unit as a result of increased manufacturing efficiencies.

Cost of automotive leasing revenue decreased $219.8 million, or 31%, in the year ended December 31, 2018 compared to the year ended December 31, 2017. The decrease was primarily due to a downward adjustment of $624.4 million from the adoption of the new revenue standard, partially offset by increased cost of automotive leasing revenue from an increase in cumulative vehicles under our direct vehicle leasing program and an increase in the number of vehicles under leasing programs where our counterparty has retained ownership of the vehicle during or at the end of the guarantee period when compared to the year ended December 31, 2017. When our counterparty retains ownership, the net book value of the leased vehicle of the lease vehicle is expensed to cost of automotive leasing revenue.

Cost of services and other revenue increased $651.3 million, or 53%, in the year ended December 31, 2018 as compared to the year ended December 31, 2017. The increase was primarily due to the increase in the cost of our new service centers, additional service personnel in existing and new service centers, Mobile Service capabilities, parts distribution centers and investment in new body shops to provide maintenance services to our rapidly growing fleet of vehicles. Additionally, there was an overall increase in the cost of used vehicle sales from the increased volume of relatively lower priced non-Tesla trade-in vehicles. These increases were partially offset by a decrease in cost of powertrain sales to another automobile manufacturer as we wound down the program in 2017.

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Gross margin for total automotive remained relatively consistent at 23% in the years ended December 31, 2018 and 2017. There were increases from improved Model S and Model X combined margins as costs per unit decreased year-over-year from continuing manufacturing efficiencies and an increase in regulatory credits sales, which have no associated costs. The increases were partially offset by margin dilution from Model 3 despite Model 3 margins improving year-over-year. The higher proportion of Model 3 as a percentage of our total automotive sales in the year ended December 31, 2018 lowered our overall gross margin for total automotive as Model 3 had a lower annualized margin than Model S and Model X due to temporary under-utilization of manufacturing capacity at lower production volumes in the first half of 2018 and as we have yet to achieve significant manufacturing efficiencies in the production of Model 3.

Gross margin for total automotive & services and other segment remained relatively consistent at 19% in the years ended December 31, 2018 and 2017 primarily due to the automotive gross margin impacts discussed above. Services and other has historically operated at lower margins than our automotive sales and leasing business but has a small impact on the overall segment margin because of its relatively small revenue base.

2017 Compared to 2016

Cost of automotive sales revenues increased $2.46 billion, or 58%, in the year ended December 31, 2017 compared to the year ended December 31, 2016. This was primarily due to a 58% increase in vehicle deliveries resulting from increased sales of Model S and Model X, as well as the commencement of deliveries of Model 3 in the third quarter of 2017.

Cost of automotive leasing revenue increased $226.2 million, or 47%, in the year ended December 31, 2017 compared to the year ended December 31, 2016. This was primarily due to an approximately 30% increase in the number of vehicles under leasing programs or programs with a resale value guarantee compared to the year ended December 31, 2016. In addition, during the year ended December 31, 2017, we recognized an increase of $23.4 million in cost of automotive leasing revenue upon early payoff and the expiration of resale value guarantees.

Cost of services and other revenue increased $756.6 million, or 160%, in the year ended December 31, 2017 compared to the year ended December 31, 2016, primarily due to the increase in cost of used vehicle sales due to increased volume and the increase in cost to provide maintenance services as our fleet continues to grow.

Gross margin for total automotive decreased from 25% to 23% in the year ended December 31, 2017 compared to the year ended December 31, 2016. The commencement of deliveries of Model 3 in the third quarter of 2017 whereby the full operating costs and depreciation were recorded at much lower production volumes as production ramps and increases in early payoffs and expirations of resale value guarantees year-over-year contributed to the lower gross margin. Lower material and manufacturing costs for Model S and Model X, as we further improved our vehicle production processes and the partial recognition of autopilot 2.0 revenue in the year ended December 31, 2017 partially offset the overall decrease.

Gross margin for total automotive & services and other segment decreased from 23% to 19% in the year ended December 31, 2017 compared to the year ended December 31, 2016. These decreases are driven by the factors impacting gross margin for total automotive, as explained above, as well as higher costs of maintenance service.

Energy Generation and Storage Segment

Cost of energy generation and storage revenue includes direct and indirect material and labor costs, warehouse rent, freight, warranty expense, other overhead costs and amortization of certain acquired intangible assets. In addition, where arrangements are accounted for as operating leases, the cost of revenue is primarily comprised of depreciation

of the cost of leased solar energy systems, maintenance costs associated with those systems and amortization of any initial direct costs.

2018 Compared to 2017

Cost of energy generation and storage revenue increased by $490.4 million, or 56%, in the year ended December 31, 2018 as compared to the year ended December 31, 2017 primarily due to increases in deployments of Powerpack, Powerwall, and cash and loan solar energy system projects. The increase in Powerpack cost of revenue was significant year-over-year due to increases in cost of revenue recognized for commercial projects, most predominantly $72.5 million for the South Australia battery project. Additionally, costs for cash and loan solar energy system projects have increased from higher installation costs, higher allocation of overhead costs from lower deployment of solar projects overall, and certain warranty related one-time charges. There were also higher costs for our solar energy system leasing arrangements due to impairment charges and higher costs from temporary manufacturing under-utilization of our Solar Roof ramp.

Gross margin for energy generation and storage decreased from 22% to 12% in the year ended December 31, 2018 compared to the year ended December 31, 2017. The decrease was primarily due to the higher proportion of energy storage of our overall energy generation and storage portfolio, due to a three-fold growth of MWh of energy storage deployments in the year ended December 31, 2018. Although energy storage margins have improved significantly as compared to the year ended December 31, 2017, it continues to operate at a lower margin than our solar business, thereby having a greater dilutive impact on our gross margin in the year ended December 31, 2018. Additionally, increases in costs for our cash and loan solar energy system projects, impairment charges on solar energy system leasing arrangements, and temporary manufacturing under-utilization of our Solar Roof ramp have further contributed to the decrease in gross margin.

2017 Compared to 2016

Cost of energy generation and storage revenue increased by $696.2 million, or 390%, in the year ended December 31, 2017 compared to the year ended December 31, 2016. This was primarily due to the inclusion of the full-year of costs from our solar business, which we gained by acquiring SolarCity on November 21, 2016.

Gross margin for energy generation and storage increased from 2% to 22% in the year ended December 31, 2017 compared to the year ended December 31, 2016. This was predominantly due to the inclusion of the full-year of revenue and costs from our solar business, which we gained by acquiring SolarCity.

Research and Development Expense

				2018 vs. 2017 Change		2017 vs. 2016 Change	
	Year Ended December 31,						
(Dollars in thousands)	2018	2017	2016	$	%	$	%
Research and development	$1,460,370	$1,378,073	$834,408	$82,297	6%	$543,665	65%
As a percentage of revenues	7 %	12 %	12 %				

Research and development (“R&D”) expenses consist primarily of personnel costs for our teams in engineering and research, manufacturing engineering and manufacturing test organizations, prototyping expense, contract and professional services and amortized equipment expense.

R&D expenses increased $82.3 million, or 6%, in the year ended December 31, 2018 compared to the year ended December 31, 2017. This increase was primarily due to an $84.2 million increase in employee and labor related expenses from headcount growth to support our business expansion and $45.2 million increase in stock-based compensation expense related to an increase in headcount and number of employee stock awards granted for new hire and refresher employee stock grants. Additionally, there was an increase of $16.0 million in facilities, freight, and depreciation expenses due to business expansion, offset by a $69.7 million decrease in expensed materials as there were higher costs in the year ended December 31, 2017 primarily related to Model 3 development.

R&D expenses increased $543.7 million, or 65%, in the year ended December 31, 2017 compared to the year ended December 31, 2016. This increase was primarily due to a $274.9 million increase in employee and labor related expenses from increased headcount as a result of our acquisitions as well as headcount growth from the expansion of our automotive and energy generation and storage businesses, and a $44.3 million increase in stock-based compensation expense related to an increase in headcount and number of employee stock awards granted for new hire and refresher employee stock grants. Additionally, there were increases in facilities expenses, depreciation expenses, professional and outside service expenses and expensed materials to support the development of future products.

Selling, General and Administrative Expense

				2018 vs. 2017 Change		2017 vs. 2016 Change	
	Year Ended December 31,						
(Dollars in thousands)	2018	2017	2016	$	%	$	%
Selling, general and administrative	$2,834,491	$2,476,500	$1,432,189	$357,991	14%	$1,044,311	73%
As a percentage of revenues	13%	21%	20%				

Selling, general and administrative (“SG&A”) expenses generally consist of personnel and facilities costs related to our stores, marketing, sales, executive, finance, human resources, information technology and legal organizations, as well as fees for professional and contract services and litigation settlements.

SG&A expenses increased $358.0 million, or 14%, in the year ended December 31, 2018 as compared to the year ended December 31, 2017. The increase was primarily due to a $193.1 million increase in stock-based compensation expense related to the 2018 CEO Performance Award and stock awards granted for new hires and refresher employee stock grants. Additionally, there was a $153.9 million increase in office, information technology and facilities-related expenses and sales and marketing activities to support our business expansion.

SG&A expenses increased $1.04 billion, or 73%, in the year ended December 31, 2017 compared to the year ended December 31, 2016. This increase was primarily due to a $524.0 million increase in employee and labor related expenses from increased headcount as a result of our acquisitions as well as headcount growth from the expansion of our automotive and energy generation and storage businesses, and a $64.9 million increase in stock-based compensation expense related to an increase in headcount and number of employee stock awards granted for new hire and refresher employee stock grants. Additionally, the increase was due to a $310.6 million increase in office, information technology and facilities-related expenses to support the growth of our business as well as sales and marketing activities to handle our expanding market presence and a $140.6 million increase in professional and outside service expenses to support the growth of our business.

Restructuring and other

	Year Ended December 31,	2018 vs. 2017 Change	2017 vs. 2016 Change

(Dollars in thousands)	2018	2017	2016	$	%	$	%
Restructuring and other	$135,233	$ —	$ —	$135,233	N/A	$—	N/A
As a percentage of revenues	1 %	0 %	0 %				

During 2018, we carried out certain restructuring actions in order to reduce costs and improve efficiency and recognized $36.6 million of employee termination expenses and estimated losses from sub-leasing a certain facility. The employee termination cash expenses of $27.3 million were substantially paid by the end of 2018, while the remaining amounts were non-cash. Also included within restructuring and other activities was $55.2 million of expenses (materially all of which were non-cash) from restructuring the energy generation and storage segment, which comprised of disposals of certain tangible assets, the shortening of the useful life of a trade name intangible asset and a contract termination penalty. In addition, we concluded that a small portion of the in-process research and development asset is not commercially feasible. Consequently, we recognized an impairment loss of $13.3 million.

In October 2018, a final court order was entered approving the terms of a settlement in connection with the SEC's legal actions relating to Elon Musk's prior consideration during the third quarter of 2018 of a take-private proposal for Tesla. Consequently, we recognized settlement and legal expenses of $30.1 million in the year ended December 31, 2018. These expenses were substantially paid by the end of 2018.

There were no restructuring actions in the years ended December 31, 2017 and 2016.

Interest Expense

	Year Ended December 31,			2018 vs. 2017 Change		2017 vs. 2016 Change	
(Dollars in thousands)	2018	2017	2016	$	%	$	%
Interest expense	$(663,071)	$(471,259)	$(198,810)	$(191,812)	41%	$(272,449)	137%
As a percentage of revenues	3 %	4 %	3 %				

Interest expense increased by $191.8 million, or 41%, in the year ended December 31, 2018 as compared to the year ended December 31, 2017. The increase was primarily due to an increase in our average outstanding indebtedness at relatively consistent weighted average interest rates as compared to the year ended December 31, 2017. Additionally, there was a decrease of $70.0 million in the amount of interest we capitalized from the consolidated statement of operations to property, plant, and equipment on the consolidated balance sheets. Lower capitalization results in higher interest expense. The amount of interest we capitalize is driven by our construction in progress balance, which decreased year-over-year due to significant Model 3 capital expenditure ramp in the year ended December 31, 2017.

Interest expense increased by $272.4 million, or 137%, in the year ended December 31, 2017 as compared to the year ended December 31, 2016. The increase was primarily due to the inclusion of the full-year of interest expense from SolarCity of $185.5 million for the year ended December 31, 2017. In addition, our average outstanding indebtedness has increased in the year ended December 31, 2017 as compared to the year ended December 31, 2016 mainly due to the Convertible Senior Notes due in 2022 and the Senior Notes due in 2025, both of which we issued during 2017.

Other Income (Expense), Net

	Year Ended December 31,			2018 vs. 2017 Change		2017 vs. 2016 Change	
(Dollars in thousands)	2018	2017	2016	$	%	$	%
Other income (expense), net	$21,866	$(125,373)	$111,272	$147,239	Not meaningful	$(236,645)	Not meaningful
As a percentage of revenues	0 %	-1 %	2 %				

Other income (expense), net, consists primarily of foreign exchange gains and losses related to our foreign currency-denominated monetary assets and liabilities and changes in the fair values of our fixed-for-floating interest rate swaps. We expect our foreign exchange gains and losses will vary depending upon movements in the underlying exchange rates.

Other income (expense), net, changed favorably by $147.2 million to a gain of $21.9 million in the year ended December 31, 2018 from a loss of $125.4 million in the year ended December 31, 2017. The change was primarily due to favorable fluctuations in foreign currency exchange rates and gains from interest rate swaps related to our debt facilities year-over-year. Additionally, we had $57.7 million of losses in the year ended December 31, 2017 for measurement period adjustments to the acquisition date fair values of certain SolarCity liabilities as previously reported in our Annual Report on Form 10-K for the year ended December 31, 2016, with no corresponding expense in the year ended December 31, 2018.

Other income (expense), net, changed unfavorably by $236.7 million to a loss of $125.4 million in the year ended December 31, 2017 from a gain of $111.3 million in the year ended December 31, 2016. The decrease was primarily due to $57.7 million of losses in the year ended December 31, 2017 for measurement period adjustments to the acquisition date fair value of SolarCity and fluctuations in foreign currency exchange rates.

Provision for Income Taxes

(Dollars in thousands)	Year Ended December 31, 2018	2017	2016	2018 vs. 2017 Change $	%	2017 vs. 2016 Change $	%
Provision for income taxes	$57,837	$31,546	$26,698	$26,291	83%	$4,848	18%
Effective tax rate	-6 %	-1 %	-4 %				

Our provision for income taxes increased by $26.3 million, or 83%, in the year ended December 31, 2018 as compared to the year ended December 31, 2017. The increase was primarily due to the increase in taxable profits in certain foreign jurisdictions year-over-year.

Our provision for income taxes increased by $4.9 million, or 18%, in the year ended December 31, 2017 as compared to the year ended December 31, 2016. This increase was primarily due to the increase in vehicle deliveries in foreign tax jurisdictions, partially offset by $10.5 million of future U.S. alternative minimum tax refunds as a result of the Tax Act, which previously had an associated valuation allowance.

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

(Dollars in thousands)	Year Ended December 31, 2018	2017	2016	2018 vs. 2017 Change $	%	2017 vs. 2016 Change $	%
Net loss attributable to noncontrolling interests and redeemable noncontrolling interests in subsidiaries	$(86,491)	$(279,178)	$(98,132)	$192,687	-69%	$(181,046)	184%

Our net income (loss) attributable to noncontrolling interests and redeemable noncontrolling interests was related to financing fund arrangements.

Liquidity and Capital Resources

As of December 31, 2018, we had $3.69 billion of cash and cash equivalents. Balances held in foreign currencies had a U.S. dollar equivalent of $749.0 million and consisted primarily of Chinese yuan, euros and Japanese yen. Our sources of cash are predominately from our deliveries of vehicles, sales and installations of our energy storage products and solar energy systems, proceeds from debt facilities, proceeds from financing funds and proceeds from equity offerings.

Our sources of liquidity and cash flows enable us to fund ongoing operations, research and development projects for new products, increases in Model 3 production capacity at the Tesla Factory, the establishment of Model 3 production capacity at Gigafactory Shanghai, the continued expansion of Gigafactory 1, the addition of manufacturing capacity for Model Y with the expectation to achieve volume production by the end of 2020, and the continued expansion of our retail and service locations, body shops, Mobile Service fleet and Supercharger network. We currently expect total 2019 capital expenditures to be approximately $2.5 billion.

In 2019, we will continue to utilize our increasing experience and learnings from past and current product ramps to do so at a level of capital efficiency per dollar of spend that we expect to be significantly greater than historical levels. For example, based on our experience with ramping Model 3 at the Tesla Factory, we expect that the capital spend per unit of Model 3 manufacturing capacity at Gigafactory Shanghai will be less than that of our line in Fremont. Likewise, based on such experience and the substantial commonality of components we expect between Model Y and Model 3, we believe that the production ramp of Model Y will be significantly faster than that of Model 3 and cost less per unit of manufacturing capacity than that of Model 3 at Fremont. Considering the pipeline of new products planned at this point, and consistent with our current strategy of using a partner to manufacture cells, as well as considering all other infrastructure growth and expansion of Gigafactory 1, Gigafactory 2 and Gigafactory Shanghai, we currently estimate that capital expenditures will be between $2.5 to $3.0 billion annually for the next two fiscal years. Moreover, we expect that the cash we generate from our core operations will generally be sufficient to cover our future capital expenditures and to pay down our near-term debt obligations (including the repayment of $920.0 million for our 0.25% Convertible Senior Notes due on March 1, 2019), although we may choose to seek alternative financing sources. For example, we expect that much of our investment in Gigafactory Shanghai will be funded through indebtedness arranged through local financial institutions in China. As always, we continually evaluate our capital expenditure needs and may decide it is best to raise additional capital to fund the rapid growth of our business.

We have an agreement to spend or incur $5.0 billion in combined capital, operational expenses, costs of goods sold and other costs in the State of New York during the 10-year period following full production at Gigafactory 2. We anticipate meeting these obligations through our operations at this facility and other operations within the State of New York, and we do not believe that we face a significant risk of default.

We expect that our current sources of liquidity together with our projection of cash flows from operating activities will provide us with adequate liquidity over at least the next 12 months. A large portion of our future expenditures is to fund our growth, and we can adjust our capital and operating expenditures by operating segment, including future expansion of our product offerings, retail and service locations, body shops, Mobile Service fleet, and Supercharger network. We may need or want to raise additional funds in the future, and these funds may not be available to us when we need or want them, or at all. If we cannot raise additional funds when we need or want them, our operations and prospects could be negatively affected.

In addition, we had $1.50 billion of unused committed amounts under our credit facilities and financing funds as of December 31, 2018, some of which are subject to satisfying specified conditions prior to draw-down (such as pledging to our lenders sufficient amounts of qualified receivables, inventories, leased vehicles and our interests in those leases, solar energy systems and the associated customer contracts, our interests in financing funds or various other assets; and contributing or selling qualified solar energy systems and the associated customer contracts or qualified leased vehicles and our interests in those leases into the financing funds). Upon the draw-down of any unused committed amounts, there are no restrictions on the use of such funds for general corporate purposes. For details regarding our indebtedness and financing funds, refer to Note 13, Long-Term Debt Obligations, and Note 18, Variable Interest Entity Arrangements, to the consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

Summary of Cash Flows

	Year Ended December 31,		
(Dollars in thousands)	2018	2017	2016
Net cash provided by (used in) operating activities	$2,097,802	$(60,654)	$(123,829)
Net cash used in investing activities	$(2,337,428)	$(4,195,877)	$(1,081,085)
Net cash provided by financing activities	$573,755	$4,414,864	$3,743,976

Cash Flows from Operating Activities

Our cash flows from operating activities are significantly affected by our cash investments to support the growth of our business in areas such as research and development and selling, general and administrative and working capital, especially inventory, which includes vehicles in transit. Our operating cash inflows include cash from vehicle sales, lease payments directly from customers, customer deposits, sales of regulatory credits and energy generation and storage products. These cash inflows are offset by our payments to suppliers for production materials and parts used in our manufacturing process, employee compensation, operating lease payments and interest payments on our financings.

Net cash from operating activities changed favorably by $2.16 billion to net cash provided by operating activities of $2.10 billion during the year ended December 31, 2018 from net cash used in operating activities of $60.7 million during the year ended December 31, 2017. This favorable change was primarily due to the increase in net income, excluding non-cash expenses and gains, of $1.60 billion and the decrease in net operating assets and liabilities of $554.6 million. The decrease in net operating assets and liabilities was mainly driven by an increase in accounts payable and accrued liabilities, as a result of increased expenditures to support our ramp of Model 3 deliveries and a net decrease in operating lease vehicles and resale value guarantee liability primarily due to the adoption of the new revenue standard, wherein certain vehicle sales to customer or leasing partners with a resale value guarantee were previously accounted for as an in-substance operating leases are now accounted for as sales with a right of return upon control transfer. The increase in cash from certain operating activities was partially offset by the increase in accounts receivable and inventory, as a result of increased Model 3 and energy products deliveries and production. Additionally, there was a decrease in customer deposits primarily due to Model 3 fulfillments and an increase in other assets as we paid $141.3 million for the land use rights for Gigafactory Shanghai.

Net cash used in operating activities during the year ended December 31, 2017 decreased by $63.2 million as compared to the year ended December 31, 2016 due to the decrease in net operating assets and liabilities of $197.3 million partially offset by the decrease in net loss, excluding non-cash expenses and gains, of $134.1 million. The decrease in working capital was mainly driven by faster processing of payments for our vehicles and our focus on reducing inventory in the fourth quarter of 2017.

During the year ended December 31, 2016, cash used in operating activities was primarily a result of our net loss of $773.0 million, the increase in accounts payable and accrued liabilities of $750.6 million as our business expanded, the increase in resale value guarantees of $326.9 million and deferred revenue of $383.0 million as the number of vehicles with a resale value guarantee increased and the increase in customer deposits of $388.4 million primarily due to Model 3 reservations. These increases were partially offset by the increase in inventories and operating lease vehicles of $2.47 billion as we expanded our program for direct leases and vehicles with a resale value guarantee.

Cash Flows from Investing Activities

Cash flows from investing activities and their variability across each period related primarily to capital expenditures, which were $2.32 billion during 2018, $4.08 billion during 2017 and $1.44 billion during 2016. Capital expenditures during 2018 were $2.10 billion from purchases of property and equipment, mainly for Model 3 production and the expansion of our customer support infrastructure, and $218.8 million for the design, acquisition and installation of solar energy systems under operating leases with customers.

Capital expenditures during 2017 were $3.41 billion from purchases of property and equipment mainly for Model 3 production and $666.5 million for the design, acquisition and installation of solar energy systems under operating leases with customers. We also paid $114.5 million, net of the cash acquired, for acquisitions in 2017.

Capital expenditures during 2016 were $1.28 billion from purchases of property and equipment and $159.7 million for the design, acquisition and installation of solar energy systems under operating leases with customers. These expenditures were partially offset by the assumed cash of $342.7 million as a result of the SolarCity acquisition in 2016.

In 2014, we began construction of Gigafactory 1. We used $687.0 million, $1.45 billion, and $455.3 million of cash towards Gigafactory 1 construction during the years ended December 31, 2018, 2017, and 2016 respectively.

Cash Flows from Financing Activities

Cash flows from financing activities during the year ended December 31, 2018 consisted primarily of $1.18 billion of net borrowings under automobile asset-backed notes, $431.0 million of net borrowings under the senior secured asset-based revolving credit agreement (the “Credit Agreement”), $334.1 million from the issuance of solar asset-backed notes and $295.7 million of proceeds from exercises of stock options and other stock issuances. These cash inflows were partially offset by net repayments of $581.9 million under our vehicle lease-backed loan and security agreements (the “Warehouse Agreements”), collateralized lease repayments of $559.2 million, repayments of $230.0 million of the 2.75% Convertible Senior Notes due on November 1, 2018, and repayments of $210.2 million under the revolving aggregation credit facility. See Note 13, Long-Term Debt Obligations, and Note 2, Summary of Significant Accounting Policies, to the consolidated financial statements included elsewhere in this Annual Report on Form 10-K for further details regarding our debt obligations and collateralized borrowings, respectively.

Cash flows from financing activities during the year ended December 31, 2017 consisted primarily of $966.4 million from the issuance of the 2.375% Convertible Senior Notes due in 2022, $1.77 billion from the issuance of the 5.3% Senior Notes due in 2025 and $400.2 million from our March 2017 public offering of common stock, net of underwriter fees. However, we paid $151.2 million for the purchase of bond hedges net of the amount we received from the sale of warrants. Furthermore, we received $511.3 million of net proceeds from collateralized lease borrowings and $527.5 million of net proceeds from fund investors.

Cash flows from financing activities during the year ended December 31, 2016 consisted primarily of $1.70 billion from our May 2016 public offering of common stock, net of underwriter fees, $995.4 million of proceeds from issuances of debt net of repayments and $769.7 million of net proceeds from collateralized lease borrowings. The net proceeds from issuances of debt consisted primarily of $834.0 million of net borrowings under the Credit Agreement and $390.0 million of borrowings under the Warehouse Agreements, partially offset by settlements of $454.7 million for certain conversions of the 1.50% Convertible Senior Notes due in June 2018. Furthermore, we received $180.3 million of net proceeds from fund investors.

Contractual Obligations

We are party to contractual obligations involving commitments to make payments to third parties, including certain debt financing arrangements and leases, primarily for stores, service centers, certain manufacturing and corporate offices. These also include, as part of our normal business practices, contracts with suppliers for purchases of certain raw materials, components and services to facilitate adequate supply of these materials and services and capacity reservation contracts. The following table sets forth, as of December 31, 2018, certain significant obligations that will affect our future liquidity (in thousands):

		Year Ended December 31,					
	Total	2019	2020	2021	2022	2023	Thereafter
Operating lease obligations	$1,628,154	$275,654	$256,931	$230,406	$182,911	$157,662	$524,590
Capital lease obligations, including interest	1,461,236	416,952	503,545	506,197	23,828	4,776	5,938
Purchase obligations (1)	18,088,100	4,860,431	3,255,968	3,391,637	3,985,336	2,570,730	23,998
Long-term debt, including scheduled interest (2)	12,570,082	2,583,160	2,485,372	2,260,528	1,629,556	302,345	3,309,121
Total	$33,747,572	$8,136,197	$6,501,816	$6,388,768	$5,821,631	$3,035,513	$3,863,647

(1) These amounts represent (i) purchase orders of $2.40 billion issued under binding and enforceable agreements with all vendors as of December 31, 2018 and (ii) $15.69 billion in other estimable purchase obligations pursuant to such agreements, primarily relating to the purchase of lithium-ion cells produced by Panasonic at Gigafactory 1, including any additional amounts we may have to pay vendors if we do not meet certain minimum purchase obligations. In cases where no purchase orders were outstanding under binding and enforceable agreements as of December 31, 2018, we have included estimated amounts based on our best estimates and assumptions or discussions with the relevant vendors as of such date or, where applicable, on amounts or assumptions included in such agreements for purposes of discussion or reference. In certain cases, such estimated amounts were subject to contingent events. Furthermore, these amounts do not include future payments for purchase obligations that were recorded in accounts payable or accrued liabilities as of December 31, 2018.

(2) Long-term debt, including scheduled interest, includes our non-recourse indebtedness of $3.61 billion. Non-recourse debt refers to debt that is recourse to only specified assets of our subsidiaries. Short-term scheduled interest payments and amortization of convertible senior note conversion features, debt discounts and deferred financing costs for the year ended December 31, 2019 is $361.2 million. Long-term scheduled interest payments and amortization of convertible senior note conversion features, debt discounts and deferred financing costs for the years thereafter is $1.58 billion.

The table above excludes unrecognized tax benefits of $243.8 million because if recognized, they would be an adjustment to our deferred tax assets.

Off-Balance Sheet Arrangements

During the periods presented, we did not have relationships with unconsolidated entities or financial partnerships, such as entities often referred to as structured finance or special purpose entities, which were established for the purpose of facilitating off-balance sheet arrangements or other contractually narrow or limited purposes.

Recent Accounting Pronouncements

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

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Foreign Currency Risk

We transact business globally in multiple currencies and hence have foreign currency risks related to our revenue, costs of revenue and operating expenses denominated in currencies other than the U.S. dollar (primarily the euro, Japanese yen, Canadian dollar, Chinese yuan and Norwegian krone). In general, we are a net receiver of currencies other than the U.S. dollar for our foreign subsidiaries. Accordingly, changes in exchange rates and, in particular, a strengthening of the U.S. dollar have in the past, and may in the future, negatively affect our revenue and other operating results as expressed in U.S. dollars.

We have also experienced, and will continue to experience, fluctuations in our net income (loss) as a result of gains (losses) on the settlement and the re-measurement of monetary assets and liabilities denominated in currencies that are not the local currency (primarily consisting of our intercompany and cash and cash equivalents balances). For the year ended December 31, 2018, we recognized a net foreign currency gain of $1.5 million in other income (expense), net, with our largest re-measurement exposures from the euro, New Taiwan dollar and Canadian dollar. For the year ended December 31, 2017, we recognized a net foreign currency loss of $52.3 million in other income (expense), net, with our largest re-measurement exposures from the euro, Canadian dollar and Norwegian krone.

We considered the historical trends in foreign currency exchange rates and determined that it is reasonably possible that adverse changes in foreign currency exchange rates of 10% for all currencies could be experienced in the near-term. These changes were applied to our total monetary assets and liabilities denominated in currencies other than our local currencies at the balance sheet dates to compute the impact these changes would have had on our net income (loss) before income taxes. These changes would have resulted in an adverse impact of $175.7 million at December 31, 2018 and $116.0 million at December 31, 2017.

Interest Rate Risk

We are exposed to interest rate risk on our borrowings that bear interest at floating rates. Pursuant to our risk management policies, in certain cases, we utilize derivative instruments to manage some of this risk. We do not enter into derivative instruments for trading or speculative purposes. A hypothetical 10% change in our interest rates would have increased our interest expense for the years ended December 31, 2018 and 2017 by $8.5 million and $7.6 million, 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 Tesla, Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Tesla, Inc. and its subsidiaries (the “Company”) as of December 31, 2018 and 2017, and the related consolidated statements of operations, of comprehensive loss, of redeemable noncontrolling interests and equity, and of cash flows for each of the three years in the period ended December 31, 2018, including the related notes (collectively referred to as the “consolidated financial statements”). We also have audited the Company's internal control over financial reporting as of December 31, 2018, 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, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018 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, 2018, based on criteria established in Internal Control - Integrated Framework (2013) issued by the COSO.

Change in Accounting Principle

As discussed in Note 2 to the consolidated financial statements, the Company changed the manner in which it accounts for revenue from contracts with customers in 2018.

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.

/s/PricewaterhouseCoopers LLP

San Jose, California

February 19, 2019

We have served as the Company's auditor since 2005.

Tesla, Inc.

Consolidated Balance Sheets

(in thousands, except per share data)

	December 31, 2018	December 31, 2017
Assets		
Current assets		
Cash and cash equivalents	$3,685,618	$3,367,914
Restricted cash	192,551	155,323
Accounts receivable, net	949,022	515,381
Inventory	3,113,446	2,263,537
Prepaid expenses and other current assets	365,671	268,365
Total current assets	8,306,308	6,570,520
Operating lease vehicles, net	2,089,758	4,116,604
Solar energy systems, leased and to be leased, net	6,271,396	6,347,490
Property, plant and equipment, net	11,330,077	10,027,522
Intangible assets, net	282,492	361,502
Goodwill	68,159	60,237
MyPower customer notes receivable, net of current portion	421,548	456,652
Restricted cash, net of current portion	398,219	441,722
Other assets	571,657	273,123
Total assets	$29,739,614	$28,655,372
Liabilities		
Current liabilities		
Accounts payable	$3,404,451	$2,390,250
Accrued liabilities and other	2,094,253	1,731,366
Deferred revenue	630,292	1,015,253
Resale value guarantees	502,840	787,333
Customer deposits	792,601	853,919
Current portion of long-term debt and capital leases	2,567,699	796,549
Current portion of promissory notes issued to related parties	—	100,000
Total current liabilities	9,992,136	7,674,670
Long-term debt and capital leases, net of current portion	9,403,672	9,418,319
Deferred revenue, net of current portion	990,873	1,177,799
Resale value guarantees, net of current portion	328,926	2,309,222
Other long-term liabilities	2,710,403	2,442,970
Total liabilities	23,426,010	23,022,980
Commitments and contingencies (Note 17)		
Redeemable noncontrolling interests in subsidiaries	555,964	397,734
Convertible senior notes (Note 13)	—	70
Equity		
Stockholders' equity		
Preferred stock; $0.001 par value; 100,000 shares authorized;	—	—

no shares issued and outstanding		
Common stock; $0.001 par value; 2,000,000 shares authorized; 172,603 and 168,797 shares issued and outstanding as of December 31, 2018 and 2017, respectively	173	169
Additional paid-in capital	10,249,120	9,178,024
Accumulated other comprehensive (loss) income	(8,218)	33,348
Accumulated deficit	(5,317,832)	(4,974,299)
Total stockholders' equity	4,923,243	4,237,242
Noncontrolling interests in subsidiaries	834,397	997,346
Total liabilities and equity	$29,739,614	$28,655,372

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

Tesla, Inc.

Consolidated Statements of Operations

(in thousands, except per share data)

	Year Ended December 31,		
	2018	2017	2016
Revenues			
Automotive sales	$17,631,522	$8,534,752	$5,589,007
Automotive leasing	883,461	1,106,548	761,759
Total automotive revenues	18,514,983	9,641,300	6,350,766
Energy generation and storage	1,555,244	1,116,266	181,394
Services and other	1,391,041	1,001,185	467,972
Total revenues	21,461,268	11,758,751	7,000,132
Cost of revenues			
Automotive sales	13,685,572	6,724,480	4,268,087
Automotive leasing	488,425	708,224	481,994
Total automotive cost of revenues	14,173,997	7,432,704	4,750,081
Energy generation and storage	1,364,896	874,538	178,332
Services and other	1,880,354	1,229,022	472,462
Total cost of revenues	17,419,247	9,536,264	5,400,875
Gross profit	4,042,021	2,222,487	1,599,257
Operating expenses			
Research and development	1,460,370	1,378,073	834,408
Selling, general and administrative	2,834,491	2,476,500	1,432,189
Restructuring and other	135,233	—	—
Total operating expenses	4,430,094	3,854,573	2,266,597
Loss from operations	(388,073)	(1,632,086)	(667,340)
Interest income	24,533	19,686	8,530
Interest expense	(663,071)	(471,259)	(198,810)
Other income (expense), net	21,866	(125,373)	111,272
Loss before income taxes	(1,004,745)	(2,209,032)	(746,348)
Provision for income taxes	57,837	31,546	26,698
Net loss	(1,062,582)	(2,240,578)	(773,046)
Net loss attributable to noncontrolling interests and redeemable noncontrolling interests in subsidiaries	(86,491)	(279,178)	(98,132)
Net loss attributable to common stockholders	$(976,091)	$(1,961,400)	$(674,914)
Net loss per share of common stock attributable to common stockholders			
Basic	$(5.72)	$(11.83)	$(4.68)
Diluted	$(5.72)	$(11.83)	$(4.68)
Weighted average shares used in computing net loss			

per share of common stock			
Basic	170,525	165,758	144,212
Diluted	170,525	165,758	144,212

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

Tesla, Inc.

Consolidated Statements of Comprehensive Loss

(in thousands)

	Year Ended December 31,		
	2018	2017	2016
Net loss attributable to common stockholders	$(976,091)	$(1,961,400)	$(674,914)
Unrealized gains (losses) on derivatives:			
Change in net unrealized gain	—	—	43,220
Less: Reclassification adjustment for net gains into net loss	—	(5,570)	(44,904)
Net unrealized loss on derivatives	—	(5,570)	(1,684)
Foreign currency translation adjustment	(41,566)	62,658	(18,500)
Other comprehensive (loss) income	(41,566)	57,088	(20,184)
Comprehensive loss	$(1,017,657)	$(1,904,312)	$(695,098)

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

Tesla, Inc.

Consolidated Statements of Redeemable Noncontrolling Interests and Equity

(in thousands, except per share data)

	Redeemable Noncontrolling Interests	Common Stock Shares	Common Stock Amount	Additional Paid-In Capital	Accumulated Deficit	Accumulated Other Comprehensive Loss	Total Stockholders' Equity	Noncontrolling Interests in Subsidiaries	Total Equity
Balance as of December 31, 2015	$—	131,425	$131	$3,409,452	$(2,322,323)	$(3,556)	$1,083,704	$—	$1,083,704
Reclassification from mezzanine equity to equity for 1.50% Convertible Senior Notes due in 2018	—	—	—	38,501	—	—	38,501	—	38,501
Exercises of conversion feature of convertible senior notes	—	—	—	(15,056)	—	—	(15,056)	—	(15,056)
Common stock issued, net of shares withheld for employee taxes	—	11,096	11	163,817	—	—	163,828	—	163,828
Issuance of common stock in May 2016 public offering at $215.00 per share, net of issuance costs of $14,595	—	7,915	8	1,687,139	—	—	1,687,147	—	1,687,147
Issuance of common stock upon acquisition of SolarCity and assumed	—	11,125	11	2,145,977	—	—	2,145,988	—	2,145,988

awards									
Stock-based compensation	—	—	—	347,357	—	—	347,357	—	347,357
Assumption of capped calls	—	—	—	(3,460)	—	—	(3,460)	—	(3,460)
Assumption of noncontrolling interests through acquisition	315,943	—	—	—	—	—	—	750,574	750,574
Contributions from noncontrolling interests through acquisition	100,996	—	—	—	—	—	—	100,531	100,531
Distributions to noncontrolling interests through acquisition	(7,137)	—	—	—	—	—	—	(10,561)	(10,561)
Net loss	(42,763)	—	—	—	(674,914)	—	(674,914)	(55,369)	(730,283)
Other comprehensive loss	—	—	—	—	—	(20,184)	(20,184)	—	(20,184)
Balance as of December 31, 2016	367,039	161,561	161	7,773,727	(2,997,237)	(23,740)	4,752,911	785,175	5,538,086
Adjustment of prior periods due to adoption of Accounting Standards Update No. 2016-09	—	—	—	15,662	(15,662)	—	—	—	—
Conversion feature of Convertible Senior Notes due in 2022	—	—	—	145,613	—	—	145,613	—	145,613
Purchases of bond hedges	—	—	—	(204,102)	—	—	(204,102)	—	(204,102)
Sales of warrants	—	—	—	52,883	—	—	52,883	—	52,883
Reclassification from mezzanine equity to equity for 1.50% Convertible Senior Notes	—	—	—	8,714	—	—	8,714	—	8,714

due in 2018									
Exercises of conversion feature of convertible senior notes	—	1,408	2	230,151	—	—	230,153	—	230,153
Common stock issued, net of shares withheld for employee taxes	—	4,257	4	259,381	—	—	259,385	—	259,385
Issuance of common stock in March 2017 public offering at $262.00 per share, net of issuance costs of $2,854	—	1,536	2	399,645	—	—	399,647	—	399,647
Issuance of common stock upon acquisitions and assumed awards	—	35	0	10,528	—		10,528	—	10,528
Stock-based compensation	—	—	—	485,822	—	—	485,822	—	485,822
Contributions from noncontrolling interests	192,421	—	—	—	—	—	—	597,282	597,282
Distributions to noncontrolling interests	(100,703)	—	—	—	—	—	—	(163,626)	(163,626)
Buy-outs of noncontrolling interests	(2,921)	—	—	—	—	—	—	(409)	(409)
Net loss	(58,102)	—	—	—	(1,961,400)	—	(1,961,400)	(221,076)	(2,182,476)
Other comprehensive income	—	—	—	—	—	57,088	57,088	—	57,088
Balance as of December 31, 2017	397,734	168,797	169	9,178,024	(4,974,299)	33,348	4,237,242	997,346	5,234,588
Adjustments for prior periods from adopting ASC 606	8,101	—	—	—	623,172	—	623,172	(89,084)	534,088
	—	—	—	—	9,386	—	9,386	—	9,386

Adjustments for prior periods from adopting Accounting Standards Update No. 2017-05									
Reclassification from mezzanine equity to equity for 1.50% Convertible Senior Notes due in 2018	—	—	—	70	—	—	70	—	70
Exercises of conversion feature of convertible senior notes	—	238	0	(40)	—	—	(40)	—	(40)
Common stock issued, net of shares withheld for employee taxes	—	3,568	4	295,719	—	—	295,723	—	295,723
Stock-based compensation	—	—	—	775,554	—	—	775,554	—	775,554
Contributions from noncontrolling interests	275,736	—	—	—	—	—	—	161,399	161,399
Distributions to noncontrolling interests	(61,557)	—	—	—	—	—	—	(209,994)	(209,994)
Buy-outs of noncontrolling interests	(2,829)	—	—	(207)	—	—	(207)	—	(207)
Net loss	(61,221)	—	—	—	(976,091)	—	(976,091)	(25,270)	(1,001,361)
Other comprehensive loss	—	—	—	—	—	(41,566)	(41,566)	—	(41,566)
Balance as of December 31, 2018	$555,964	172,603	$173	$10,249,120	$(5,317,832)	$(8,218)	$4,923,243	$834,397	$5,757,640

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

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Tesla, Inc.

Consolidated Statements of Cash Flows

(in thousands)

	Year Ended December 31,		
	2018	2017	2016
Cash Flows from Operating Activities			
Net loss	$(1,062,582)	$(2,240,578)	$(773,046)
Adjustments to reconcile net loss to net cash provided by (used in) operating activities:			
Depreciation, amortization and impairment	1,901,050	1,636,003	947,099
Stock-based compensation	749,024	466,760	334,225
Amortization of debt discounts and issuance costs	158,730	91,037	94,690
Inventory write-downs	85,272	131,665	65,520
Loss on disposals of fixed assets	161,361	105,770	34,633
Foreign currency transaction (gains) losses	(1,511)	52,309	(29,183)
Loss (gain) related to SolarCity acquisition	—	57,746	(88,727)
Non-cash interest and other operating activities	48,507	135,237	(15,179)
Changes in operating assets and liabilities, net of effect of business combinations:			
Accounts receivable	(496,732)	(24,635)	(216,565)
Inventory	(1,023,264)	(178,850)	(632,867)
Operating lease vehicles	(214,747)	(1,522,573)	(1,832,836)
Prepaid expenses and other current assets	(82,125)	(72,084)	56,806
Other assets and MyPower customer notes receivable	(207,409)	(15,453)	(49,353)
Accounts payable and accrued liabilities	1,722,850	388,206	750,640
Deferred revenue	406,661	468,902	382,962
Customer deposits	(96,685)	170,027	388,361
Resale value guarantee	(110,564)	208,718	326,934
Other long-term liabilities	159,966	81,139	132,057
Net cash provided by (used in) operating activities	2,097,802	(60,654)	(123,829)
Cash Flows from Investing Activities			
Purchases of property and equipment excluding capital leases, net of sales	(2,100,724)	(3,414,814)	(1,280,802)
Maturities of short-term marketable securities	—	—	16,667
Purchases of solar energy systems, leased and to be leased	(218,792)	(666,540)	(159,669)
Business combinations, net of cash acquired	(17,912)	(114,523)	342,719
Net cash used in investing activities	(2,337,428)	(4,195,877)	(1,081,085)
Cash Flows from Financing Activities			
Proceeds from issuances of common stock in public offerings	—	400,175	1,701,734
Proceeds from issuances of convertible and other debt	6,176,173	7,138,055	2,852,964
Repayments of convertible and other debt	(5,247,057)	(3,995,484)	(1,857,594)
Repayments of borrowings issued to related parties	(100,000)	(165,000)	—
Collateralized lease (repayments) borrowings	(559,167)	511,321	769,709
Proceeds from exercises of stock options and other stock issuances	295,722	259,116	163,817
Principal payments on capital leases	(180,805)	(103,304)	(46,889)

Common stock and debt issuance costs	(14,973)	(63,111)	(20,042)
Purchases of convertible note hedges	—	(204,102)	—
Proceeds from settlement of convertible note hedges	—	287,213	—
Proceeds from issuances of warrants	—	52,883	—
Payments for settlements of warrants	(11)	(230,385)	—
Proceeds from investments by noncontrolling interests in subsidiaries	437,134	789,704	201,527
Distributions paid to noncontrolling interests in subsidiaries	(227,304)	(261,844)	(21,250)
Payments for buy-outs of noncontrolling interests in subsidiaries	(5,957)	(373)	—
Net cash provided by financing activities	573,755	4,414,864	3,743,976
Effect of exchange rate changes on cash and cash equivalents and restricted cash	(22,700)	39,726	(6,553)
Net increase in cash and cash equivalents and restricted cash	311,429	198,059	2,532,509
Cash and cash equivalents and restricted cash, beginning of period	3,964,959	3,766,900	1,234,391
Cash and cash equivalents and restricted cash, end of period	$4,276,388	$3,964,959	$3,766,900
Supplemental Non-Cash Investing and Financing Activities			
Shares issued in connection with business combinations and assumed vested awards	$—	$10,528	$2,145,977
Acquisitions of property and equipment included in liabilities	$249,141	$914,108	$663,771
Estimated fair value of facilities under build-to-suit leases	$94,445	$313,483	$307,879
Supplemental Disclosures			
Cash paid during the period for interest, net of amounts capitalized	$380,836	$182,571	$38,693
Cash paid during the period for taxes, net of refunds	$35,409	$65,695	$16,385

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

Tesla, Inc.

Notes to Consolidated Financial Statements

Note 1 – Overview

Tesla, Inc. ("Tesla", the "Company", "we", "us" or "our") was incorporated in the State of Delaware on July 1, 2003. We desig develop, manufacture and sell high-performance fully electric vehicles and design, manufacture, install and sell solar energy generation and energy storage products. Our Chief Executive Officer, as the chief operating decision maker ("CODM"), organizes the Company, manages resource allocations and measures performance among two operating and reportable segments: (i) automotive and (ii) energy generation and storage.

Note 2 – Summary of Significant Accounting Policies

Principles of Consolidation

The accompanying consolidated financial statements have been prepared in conformity with U.S. generally accepted accounting principles ("GAAP") and reflect our accounts and operations and those of our subsidiaries in which we have a controlling financial interest. In accordance with the provisions of Accounting Standards Codification ("ASC") 810, Consolidation, we consolidate any variable interest entity ("VIE") of which we are the primary beneficiary. We form VIEs with financing fund investors in the ordinary course of business in order to facilitate the funding and monetization of certain attributes associated with solar energy systems and leases under our direct vehicle leasing programs. The typical condition for a controlling financial interest ownership 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 controlling voting interests. ASC 810 requires a variable interest holder to consolidate a VIE if that party has the power to direct the activities of the VIE that most significantly impact the VIE's economic performance and the obligation to absorb losses of the VIE that could potentially be significant to the VIE or the right to 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 determined that we are the primary beneficiary of a number of VIEs (see Note 18, Variable Interest Entity Arrangements). We evaluate our relationships with all the VIEs on an ongoing basis to ensure that we continue to be the primary beneficiary. All intercompany transactions and balances have been eliminated upon consolidation.

Reclassifications

Certain prior period balances have been reclassified to conform to the current period presentation in the consolidated financial statements and the accompanying notes as a result of the adoption of the Accounting Standards Update ("ASU") 2016-18, Statement of Cash Flows: Restricted Cash.

Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities and disclosures in the accompanying notes. Estimates

are used for, but not limited to, determining the transaction price of products and services in arrangements with multiple performance obligations and determining the amortization period of these obligations, significant economic incentive for residual value guarantee arrangements, sales return reserves, the collectability of accounts receivable, inventory valuation, fair value of long-lived assets, goodwill, fair value of financial instruments, residual value of operating lease vehicles, depreciable lives of property and equipment and solar energy systems, fair value and residual value of solar energy systems subject to leases, warranty liabilities, income taxes, contingencies, the accrued liability for solar energy system performance guarantees, determining lease pass-through financing obligations, the discount rates used to determine the fair value of investment tax credits, the valuation of build-to-suit lease assets, fair value of interest rate swaps and inputs used to value stock-based compensation. In addition, estimates and assumptions are used for the accounting for business combinations, including the fair values and useful lives of acquired assets, assumed liabilities and noncontrolling interests. Management bases its 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 from those estimates.

Revenue Recognition

Adoption of new accounting standards

ASU 2014-09, Revenue - Revenue from Contracts with Customers. On January 1, 2018, we adopted the new accounting standard ASC 606, Revenue from Contracts with Customers and all the related amendments ("new revenue standard") using the modified retrospective method. As a policy election, the new revenue standard was applied only to contracts that were not substantially completed as of the date of adoption. We recognized the cumulative effect of initially applying the new revenue standard as an adjustment to the January 1, 2018 opening balance of accumulated deficit. The prior period consolidated financial statements have not been retrospectively adjusted and continue to be reported under the accounting standards in effect for those periods.

A majority of our automotive sales revenue is recognized when control transfers upon delivery to customers. For certain vehicle sales where revenue was previously deferred as an in-substance operating lease, such as certain vehicle sales to customers or leasing partners with a resale value guarantee, we now recognize revenue when the vehicles are shipped as a sale with a right of return. As a result, the corresponding operating lease asset, deferred revenue, and resale value guarantee balances as of December 31, 2017, were reclassified to accumulated deficit as part of our adoption entry. Furthermore, the warranty liability related to such vehicles has been accrued as a result of the change from in-substance operating leases to vehicle sales. Prepayments on contracts that can be cancelled without significant penalties, such as vehicle maintenance plans, have been reclassified from deferred revenue to customer deposits. Refer to the Automotive Revenue and Automotive Leasing Revenue sections below for further discussion of the impact on various categories of vehicle sales.

Following the adoption of the new revenue standard, the revenue recognition for our other sales arrangements, including sales of solar energy systems, energy storage products, services, and sales of used vehicles, remained consistent with our historical revenue recognition policy. Under our lease pass-through fund arrangements, we do not have any further performance obligations and therefore reclassified all investment tax credit ("ITC") deferred revenue as of December 31, 2017, to accumulated deficit as part of our adoption entry. The corresponding effects of the changes to lease pass-through fund arrangements are also reflected in our non-controlling interests in subsidiaries. Additionally, we have considered the impact from any new revenue arrangements in the current year that would have been accounted for differently under ASC 605, Revenue Recognition, as an adjustment from adoption of the new revenue standard.

Accordingly, the cumulative effect of the changes made to our consolidated January 1, 2018 consolidated balance sheet for the adoption of the new revenue standard was as follows (in thousands):

	Balances at December 31, 2017	Adjustments from Adoption of New Revenue Standard	Balances at January 1, 2018
Assets			
Inventory	$ 2,263,537	$ (27,009)	$2,236,528
Prepaid expenses and other current assets	268,365	51,735	320,100
Operating lease vehicles, net	4,116,604	(1,808,932)	2,307,672
Other assets	273,123	68,355	341,478
Liabilities			
Accrued liabilities and other	1,731,366	74,487	1,805,853
Deferred revenue	1,015,253	(436,737)	578,516
Resale value guarantees	787,333	(295,909)	491,424
Customer deposits	853,919	56,081	910,000
Deferred revenue, net of current portion	1,177,799	(429,771)	748,028
Resale value guarantees, net of current portion	2,309,222	(1,346,179)	963,043
Other long-term liabilities	2,442,970	104,767	2,547,737
Redeemable noncontrolling interests in subsidiaries	397,734	8,101	405,835
Equity			
Accumulated other comprehensive income	33,348	15,221	48,569
Accumulated deficit	(4,974,299)	623,172	(4,351,127)
Noncontrolling interests in subsidiaries	997,346	(89,084)	908,262

In accordance with the new revenue standard requirements, the impact of adoption on our consolidated balance sheet was as follows (in thousands):

	December 31, 2018		
	As Reported	Balances Without Adoption of New Revenue Standard	Effect of Change Higher / (Lower)
Assets			
Inventory	3,113,446	3,183,615	(70,169)
Prepaid expenses and other current assets	365,671	278,929	86,742
Operating lease vehicles, net	2,089,758	4,103,277	(2,013,519)
Other assets	571,657	463,558	108,099
Liabilities			
Accrued liabilities and other	2,094,253	2,005,180	89,073
Deferred revenue	630,292	1,122,427	(492,135)
Resale value guarantees	502,840	831,350	(328,510)
Customer deposits	792,601	734,241	58,360
Deferred revenue, net of current portion	990,873	1,432,566	(441,693)
Resale value guarantees, net of current portion	328,926	1,994,442	(1,665,516)
Other long-term liabilities	2,710,403	2,587,794	122,609
Redeemable noncontrolling interests in subsidiaries	555,964	549,520	6,444
Equity			
Accumulated other comprehensive loss	(8,218)	6,314	(14,532)
Accumulated deficit	(5,317,832)	(6,163,834)	846,002
Noncontrolling interests in subsidiaries	834,397	903,346	(68,949)

In accordance with the new revenue standard requirements, the impact of adoption on our consolidated statement of operations and consolidated statement of comprehensive loss was as follows (in thousands):

	Year Ended December 31, 2018		
	As Reported	Balances Without Adoption of New Revenue Standard	Effect of Change Higher / (Lower)
Revenues			
Automotive sales	$17,631,522	$ 16,228,508	$1,403,014
Automotive leasing	883,461	1,716,136	(832,675)
Energy generation and storage	1,555,244	1,540,419	14,825
Cost of revenues			
Automotive sales	13,685,572	12,715,818	969,754
Automotive leasing	488,425	1,112,828	(624,403)
Provision for income taxes	57,837	59,332	(1,495)
Net loss	(1,062,582)	(1,303,890)	241,308
Net loss attributable to noncontrolling interests and redeemable noncontrolling interests in subsidiaries	(86,491)	(104,969)	18,478
Net loss attributable to common stockholders	(976,091)	(1,198,921)	222,830
Foreign currency translation adjustment	(41,566)	(11,813)	(29,753)
Comprehensive loss	(1,017,657)	(1,210,734)	193,077

In accordance with the new revenue standard requirements, the impact of adoption on our consolidated statement of cash flows for the year ended December 31, 2018 was an increase in collateralized lease repayments of $474.2 million, from a net financing cash outflow of $84.9 million to a net financing cash outflow of $559.2 million as presented, with an offsetting increase to cash outflows from operations. Additionally, the adjustments to the consolidated balance sheet, consolidated statement of operations and consolidated statement of comprehensive income (loss) identified above would have corresponding impacts within the operating section of the consolidated statement of cash flows.

Automotive Segment

Automotive Sales Revenue

Automotive Sales without Resale Value Guarantee

Automotive sales revenue includes revenues related to deliveries of new vehicles, and specific other features and services that meet the definition of a performance obligation under the new revenue standard, including access to our Supercharger network, internet connectivity, Autopilot, full self-driving and over-the-air software updates. We recognize revenue on automotive sales upon delivery to the customer, which is when the control of a vehicle transfers. Payments are typically received at the point control transfers or in accordance with payment terms customary to the business. Other features and services such as access to our Supercharger network, internet connectivity and over-the-air software updates are provisioned upon control transfer of a vehicle and recognized over time on a straight-line basis as we have a stand-ready obligation to deliver such services to the customer. We recognize revenue related to these other features and services over the performance period, which is generally the expected ownership life of the vehicle or the eight-year life of the vehicle. Revenue related to Autopilot and full self-driving features is recognized when functionality is delivered to the customer. For our obligations related to automotive sales, we estimate standalone selling price by considering costs used to develop and deliver the service, third-party pricing of similar options and other information that may be available.

At the time of revenue recognition, we reduce the transaction price and record a reserve against revenue for estimated variable consideration related to future product returns. Such estimates are based on historical experience and are immaterial in all periods presented. In addition, any fees that are paid or payable by us to a customer's lender when we arrange the financing are recognized as an offset against automotive sales revenue.

Costs to obtain a contract mainly relate to commissions paid to our sales personnel for the sale of vehicles. Commissions are not paid on other obligations such as access to our Supercharger network, internet connectivity, Autopilot, full self-driving and over-the-air software updates. As our contract costs related to automotive sales are typically fulfilled within one year, the costs to obtain a contract are expensed as incurred. Amounts billed to customers related to shipping and handling are classified as automotive revenue, and we have elected to recognize the cost for freight and shipping when control over vehicles, parts, or accessories have transferred to the customer as an expense in cost of revenues. Our policy is to exclude taxes collected from a customer from the transaction price of automotive contracts.

Automotive Sales with Resale Value Guarantee

We offer resale value guarantees or similar buy-back terms to certain international customers who purchase vehicles and who finance their vehicles through one of our specified commercial banking partners. We also offer resale value guarantees in connection with automotive sales to certain leasing partners. Under these programs, we receive full payment for the vehicle sales price at the time of delivery and our counterparty has the option of selling their vehicle back to us during the guarantee period, which currently is generally at the end of the term of the applicable loan or financing program, for a pre-determined resale value.

With the exception of two programs which are discussed within the Automotive Leasing section, we now recognize revenue when control transfers upon delivery to customers in accordance with the new revenue standard as a sale with a right of return as we do not believe the customer has a significant economic incentive to exercise the resale value guarantee provided to them. The process to determine whether there is a significant economic incentive includes a comparison of a vehicle's estimated market value at the time the option is exercisable with the guaranteed resale value to determine the customer's economic incentive to exercise. The performance obligations and the pattern of recognizing automotive sales with resale value guarantees are consistent with automotive sales without resale value guarantees with the exception of our estimate for sales return reserve. Sales return reserves for automotive sales with resale value guarantees are estimated based on historical experience plus consideration for expected future market values. The two programs that are still being recorded as operating leases are discussed in further detail below in Vehicle Sales to Leasing Partners with a Resale Value Guarantee and a Buyback Option and Vehicle Sales to Customers with a Resale Value Guarantee where Exercise is Probable.

Prior to the adoption of the new revenue standard, all transactions with resale value guarantees were recorded as operating leases. The amount of sale proceeds equal to the resale value guarantee was deferred until the guarantee expired or was exercised. For certain transactions that were considered interest bearing collateralized borrowings as required under ASC 840, Leases, we also accrued interest expense based on our borrowing rate. The remaining sale proceeds were deferred and recognized on a straight-line basis over the stated guarantee period to automotive leasing revenue. The guarantee period expired at the earlier of the end of the guarantee period or the pay-off of the initial loan. We capitalized the cost of these vehicles on the consolidated balance sheet as operating lease vehicles, net, and depreciated their value, less estimated residual value, to cost of automotive leasing revenue over the same period.

In cases where our counterparty retained ownership of the vehicle at the end of the guarantee period, the resale value guarantee liability and any remaining deferred revenue balances related to the vehicle were settled to automotive leasing revenue, and the net book value of the leased vehicle was expensed to cost of automotive leasing revenue. If our counterparty returned the vehicle to us during the guarantee period, we purchased the vehicle from our

counterparty in an amount equal to the resale value guarantee and settled any remaining deferred balances to automotive leasing revenue, and we reclassified the net book value of the vehicle on the consolidated balance sheet to used vehicle inventory.

Deferred revenue activity related to the access to our Supercharger network, internet connectivity, Autopilot, full self-driving and over-the-air software updates on automotive sales with and without resale value guarantee consisted of the following (in thousands):

	Year Ended December 31, 2018
Deferred revenue on automotive sales with and without resale value guarantee— beginning of period (post adoption of new revenue standard)	$ 475,919
Additions	532,294
Net changes in liability for pre-existing contracts	(13,248)
Revenue recognized	(112,214)
Deferred revenue on automotive sales with and without resale value guarantee— end of period	$ 882,751

Deferred revenue is equivalent to the total transaction price allocated to the performance obligations that are unsatisfied, or partially unsatisfied, as of December 31, 2018. From the deferred revenue balance as of January 1, 2018, revenue recognized during the year ended December 31, 2018 was $81.0 million. Of the total deferred revenue on automotive sales with and without resale value guarantees, we expect to recognize $326.7 million of revenue in the next 12 months. The remaining balance will be recognized over the performance period as discussed above in Automotive Sales without Resale Value Guarantee.

Automotive Regulatory Credits

California and certain other states have laws in place requiring vehicle manufacturers to ensure that a portion of the vehicles delivered for sale in that state during each model year are zero-emission vehicles. These laws and regulations provide that a manufacturer of zero-emission vehicles may earn regulatory credits (“ZEV credits”) and may sell excess credits to other manufacturers who apply such credits to comply with these regulatory requirements. Similar regulations exist at the federal level that require compliance related to greenhouse gas (“GHG”) emissions and also allow for the sale of excess credits by one manufacturer to other manufacturers. As a manufacturer solely of zero-emission vehicles, we have earned emission credits, such as ZEV and GHG credits, on our vehicles, and we expect to continue to earn these credits in the future. We enter into contractual agreements with third-parties to purchase our regulatory credits. Payments for regulatory credits are typically received at the point control transfers to the customer, or in accordance with payment terms customary to the business.

We recognize revenue on the sale of regulatory credits at the time control of the regulatory credits is transferred to the purchasing party as automotive revenue in the consolidated statement of operations. Revenue from the sale of regulatory credits totaled $418.6 million, $360.3 million and $302.3 million for the years ended December 31, 2018, 2017 and 2016, respectively. We had no deferred revenue related to sales of automotive regulatory credits as of December 31, 2018 and 2017.

Automotive Leasing Revenue

Automotive leasing revenue includes revenue recognized under lease accounting guidance for our direct leasing programs as well as the two programs with resale value guarantees which continue to qualify for operating lease treatment. Prior to the adoption of the new revenue standard, all programs with resale value guarantees were accounted for as operating leases.

Direct Vehicle Leasing Program

We have outstanding leases under our direct vehicle leasing programs in certain locations in the U.S., Canada and Europe. Currently, the direct vehicle leasing program is only offered for new leases to qualified customers in the U.S. and Canada. Qualifying customers are permitted to lease a vehicle directly from Tesla for up to 48 months. At the end of the lease term, customers have the option of either returning the vehicle to us or purchasing it for a pre-determined residual value. We account for these leasing transactions as operating leases. We record leasing revenues to automotive leasing revenue on a straight-line basis over the contractual term, and we record the depreciation of these vehicles to cost of automotive leasing revenue. For the years ended December 31, 2018, 2017 and 2016, we recognized $393.2 million, $220.6 million and $112.7 million, respectively. As of December 31, 2018 and 2017, we had deferred $109.8 million and $96.6 million, respectively, of lease-related upfront payments, which will be recognized on a straight-line basis over the contractual terms of the individual leases.

We capitalize shipping costs and initial direct costs such as the incremental cost of contract administration, referral fees and sales commissions from the origination of automotive lease agreements as an element of operating lease vehicles, net, and subsequently amortize these costs over the term of the related lease agreement. Our policy is to exclude taxes collected from a customer from the transaction price of automotive contracts.

Vehicle Sales to Leasing Partners with a Resale Value Guarantee and a Buyback Option

We offer buyback options in connection with automotive sales with resale value guarantees with certain leasing partner sales in the United States. These transactions entail a transfer of leases, which we have originated with an end-customer, to our leasing partner. As control of the vehicles has not been transferred in accordance with the new revenue standard, these transactions continue to be accounted for as interest bearing collateralized borrowings in accordance with ASC 840, Leases. Under this program, cash is received for the full price of the vehicle and the collateralized borrowing value is generally recorded within resale value guarantees and the customer upfront deposit is recorded within deferred revenue. We amortize the deferred revenue amount to automotive leasing revenue on a straight-line basis over the option period and accrue interest expense based on our borrowing rate. We capitalize vehicles under this program to operating lease vehicles, net, on the consolidated balance sheet, and we record depreciation from these vehicles to cost of automotive leasing revenue during the period the vehicle is under a lease arrangement. Cash received for these vehicles, net of revenue recognized during the period, is classified as collateralized lease (repayments) borrowings within cash flows from financing activities in the consolidated statement of cash flows.

At the end of the lease term, we settle our liability in cash by either purchasing the vehicle from the leasing partner for the buyback option amount or paying a shortfall to the option amount the leasing partner may realize on the sale of the vehicle. Any remaining balances within deferred revenue and resale value guarantee will be settled to automotive leasing revenue. In cases where the leasing partner retains ownership of the vehicle after the end of our option period, we expense the net value of the leased vehicle to cost of automotive leasing revenue. The maximum amount we could be required to pay under this program, should we decide to repurchase all vehicles, was $479.8 million as of December 31, 2018, including $309.8 million within a 12-month period. As of December 31, 2018, we had $558.3 million of such borrowings recorded in resale value guarantees and $92.5 million recorded in deferred revenue liability. For the year ended December 31, 2018, we recognized $332.4 million of leasing revenue related to this program.

On a quarterly basis, we assess the estimated market values of vehicles under our buyback options program to determine if we have sustained a loss on any of these contracts. As we accumulate more data related to the buyback values of our vehicles or as market conditions change, there may be material changes to their estimated values, although we have not experienced any material losses during any period to date.

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Vehicle Sales to Customers with a Resale Value Guarantee where Exercise is Probable

For certain international programs where we have offered resale value guarantees to certain customers who purchased vehicles and where we expect the customer has a significant economic incentive to exercise the resale value guarantee provided to them, we continue to recognize these transactions as operating leases. The process to determine whether there is a significant economic incentive includes a comparison of a vehicle's estimated market value at the time the option is exercisable with the guaranteed resale value to determine the customer's economic incentive to exercise. We have not sold any vehicles under this program since the first half of 2017 and all current period activity relates to the exercise or cancellation of active transactions. The amount of sale proceeds equal to the resale value guarantee is deferred until the guarantee expires or is exercised. The remaining sale proceeds are deferred and recognized on a straight-line basis over the stated guarantee period to automotive leasing revenue. The guarantee period expires at the earlier of the end of the guarantee period or the pay-off of the initial loan. We capitalize the cost of these vehicles on the consolidated balance sheet as operating lease vehicles, net, and depreciate their value, less salvage value, to cost of automotive leasing revenue over the same period.

In cases where a customer retains ownership of a vehicle at the end of the guarantee period, the resale value guarantee liability and any remaining deferred revenue balances related to the vehicle are settled to automotive leasing revenue, and the net book value of the leased vehicle is expensed to cost of automotive leasing revenue. If a customer returns the vehicle to us during the guarantee period, we purchase the vehicle from the customer in an amount equal to the resale value guarantee and settle any remaining deferred balances to automotive leasing revenue, and we reclassify the net book value of the vehicle on the consolidated balance sheet to used vehicle inventory. As of December 31, 2018, $149.7 million of the guarantees were exercisable by customers within the next 12 months. For the year ended December 31, 2018, we recognized $157.9 million of leasing revenue related to this program.

Services and Other Revenue

Services and other revenue consists of non-warranty after-sales vehicle services, sales of used vehicles, sales of electric vehicle components to other manufacturers, retail merchandise, and sales by our acquired subsidiaries to third party customers. There were no significant changes to the timing or amount of revenue recognition as a result of our adoption of the new revenue standard.

Revenues related to repair and maintenance services are recognized over time as services are provided and extended service plans are recognized over the performance period of the service contract as the obligation represents a stand-ready obligation to the customer. We sell used vehicles, services, service plans, vehicle components and merchandise separately and thus use standalone selling prices as the basis for revenue allocation to the extent that these items are sold in transactions with other performance obligations. Payment for used vehicles, services, and merchandise are typically received at the point when control transfers to the customer or in accordance with payment terms customary to the business. Payments received for prepaid plans are refundable upon customer cancellation of the related contracts and are included within customer deposits on the consolidated balance sheet. Deferred revenue related to services and other revenue was immaterial as of December 31, 2018 and 2017.

Energy Generation and Storage Segment

Energy Generation and Storage Sales

Energy generation and storage revenues consists of the sale of solar energy systems and energy storage systems to residential, small commercial, and large commercial and utility grade customers. Sales of solar energy systems to

residential and small scale commercial customers consist of the engineering, design, and installation of the system. Post installation, residential and small scale commercial customers receive a proprietary monitoring system that captures and displays historical energy generation data. Residential and small scale commercial customers pay the full purchase price of the solar energy system upfront. Revenue for the design and installation obligation is recognized when control transfers, which is when we install a solar energy system and the system passes inspection by the utility or the authority having jurisdiction. Revenue for the monitoring service is recognized ratably as a stand-ready obligation over the warranty period of the solar energy system. Sales of energy storage systems to residential and small scale commercial customers consist of the installation of the energy storage system and revenue is recognized when control transfers, which is when the product has been delivered or, if we are performing installation, when installed and accepted by the customer. Payment for such storage systems is made upon invoice or in accordance with payment terms customary to the business.

For large commercial and utility grade solar energy system and energy storage system sales which consist of the engineering, design, and installation of the system, customers make milestone payments that are consistent with contract-specific phases of a project. Revenue from such contracts is recognized over time using the percentage of completion method based on cost incurred as a percentage of total estimated contract costs. Certain large-scale commercial and utility grade solar energy system and energy storage system sales also include operations and maintenance service which are negotiated with the design and installation contracts and are thus considered to be a combined contract with the design and installation service. For certain large commercial and utility grade solar energy systems and energy storage systems where the percentage of completion method does not apply, revenue is recognized when control transfers, which is when the product has been delivered to the customer for energy storage systems and when the project has received permission to operate from the utility for solar energy systems. Operations and maintenance service revenue is recognized ratably over the respective contract term. Customer payments for such services are usually paid annually or quarterly in advance.

In instances where there are multiple performance obligations in a single contract, we allocate the consideration to the various obligations in the contract based on the relative standalone selling price method. Standalone selling prices are estimated based on estimated costs plus margin or using market data for comparable products. Costs incurred on the sale of residential installations before the solar energy systems are completed are included as work in process within inventory in the consolidated balance sheets. However, any fees that are paid or payable by us to a solar loan lender would be recognized as an offset against revenue. Costs to obtain a contract relate mainly to commissions paid to our sales personnel related to the sale of solar energy systems and energy storage systems. As our contract costs related to solar energy system and energy storage system sales are typically fulfilled within one year, the costs to obtain a contract are expensed as incurred.

As part of our solar energy system and energy storage system contracts, we may provide the customer with performance guarantees that warrant that the underlying system will meet or exceed the minimum energy generation or retention requirements specified in the contract. In certain instances, we may receive a bonus payment if the system performs above a specified level. Conversely, if a solar energy system or energy storage system does not meet the performance guarantee requirements, we may be required to pay liquidated damages. Other forms of variable consideration related to our large commercial and utility grade solar energy system and energy storage system contracts include variable customer payments that will be made based on our energy market participation activities. Such guarantees and variable customer payments represent a form of variable consideration and are estimated at contract inception at their most likely amount and updated at the end of each reporting period as additional performance data becomes available. Such estimates are included in the transaction price only to the extent that it is probable a significant reversal of revenue will not occur.

We record as deferred revenue any non-refundable amounts that are collected from customers related to fees charged for prepayments and remote monitoring service and operations and maintenance service, which is recognized as revenue ratably over the respective customer contract term. As of December 31, 2018 and 2017, deferred revenue related to such customer payments amounted to $148.7 million and $124.0 million, respectively. Revenue recognized from the deferred revenue balance as of January 1, 2018, was $41.4 million for the year ended December 31, 2018. We have elected the practical expedient to omit disclosure of the amount of the transaction price allocated to remaining performance obligations for energy generation and storage sales with an original expected contract length of one year or less. As of December 31, 2018, total transaction price allocated to performance obligations that were unsatisfied or partially unsatisfied for contracts with an original expected length of more than one year was $117.9 million. Of this amount, we expect to recognize $7.0 million in the next 12 months and the remaining over a period up to 30 years.

Energy Generation and Storage Leasing

For revenue arrangements where we are the lessor under operating lease agreements for energy generation and storage products, we record lease revenue from minimum lease payments, including upfront rebates and incentives earned from such systems, on a straight-line basis over the life of the lease term, assuming all other revenue recognition criteria have been met. The difference between the payments received and the revenue recognized is recorded as deferred revenue on the consolidated balance sheet.

For solar energy systems where customers purchase electricity from us under power purchase agreements ("PPAs"), we have determined that these agreements should be accounted for as operating leases pursuant to ASC 840. Revenue is recognized based on the amount of electricity delivered at rates specified under the contracts, assuming all other revenue recognition criteria are met.

We record as deferred revenue any amounts that are collected from customers, including lease prepayments, in excess of revenue recognized and operations and maintenance service, which is recognized as revenue ratably over the respective customer contract term. As of December 31, 2018 and 2017, deferred revenue related to such customer payments amounted to $225.4 million and $206.8 million, respectively. Deferred revenue also includes the portion of rebates and incentives received from utility companies and various local and state government agencies, which is recognized as revenue over the lease term. As of December 31, 2018 and December 31, 2017, deferred revenue from rebates and incentives amounted to $36.8 million and $27.2 million, respectively.

We capitalize initial direct costs from the origination of solar energy system leases or PPAs, which include the incremental cost of contract administration, referral fees and sales commissions, as an element of solar energy systems, leased and to be leased, net, and subsequently amortize these costs over the term of the related lease or PPA.

Revenue by source

The following table disaggregates our revenue by major source (in thousands):

	Year Ended December 31, 2018
Automotive sales without resale value guarantee	$ 15,809,890
Automotive sales with resale value guarantee	1,403,014
Automotive regulatory credits	418,618
Energy generation and storage sales	1,056,543
Services and other	1,391,041
Total revenues from sales and services	20,079,106
Automotive leasing	883,461
Energy generation and storage leasing	498,701
Total revenues	$ 21,461,268

Cost of Revenues

Automotive Segment

Automotive Sales

Cost of automotive sales revenue includes direct parts, material and labor costs, manufacturing overhead, including depreciation costs of tooling and machinery, shipping and logistic costs, vehicle connectivity costs, allocations of electricity and infrastructure costs related to our Supercharger network, and reserves for estimated warranty expenses. Cost of automotive sales revenues also includes adjustments to warranty expense and charges to write down the carrying value of our inventory when it exceeds its estimated net realizable value and to provide for obsolete and on-hand inventory in excess of forecasted demand.

Automotive Leasing

Cost of automotive leasing revenue includes primarily the amortization of operating lease vehicles over the lease term, as well as warranty expenses recognized as incurred. Cost of automotive leasing revenue also includes vehicle connectivity costs and allocations of electricity and infrastructure costs related to our Supercharger network for vehicles under our leasing programs.

Services and Other

Costs of services and other revenue includes costs associated with providing non-warranty after-sales services, costs to acquire and certify used vehicles, and costs for retail merchandise. Cost of services and other revenue also includes direct parts, material and labor costs, manufacturing overhead associated with the sales of electric vehicle components and systems to other manufacturers and sales by our acquired subsidiaries to third party customers.

Energy Generation and Storage Segment

Energy Generation and Storage

Energy generation and storage cost of revenue includes direct and indirect material and labor costs, warehouse rent, freight, warranty expense, other overhead costs and amortization of certain acquired intangible assets. In addition, where arrangements are accounted for as operating leases, the cost of revenue is primarily comprised of depreciation of the cost of leased solar energy systems, maintenance costs associated with those systems and amortization of any initial direct costs.

Research and Development Costs

Research and development costs are expensed as incurred.

Marketing, Promotional and Advertising Costs

Marketing, promotional and advertising costs are expensed as incurred and are included as an element of selling, general and administrative expense in the consolidated statement of operations. We incurred marketing, promotional and advertising costs of $70.0 million, $66.5 million and $48.0 million in the years ended December 31, 2018, 2017 and 2016, respectively.

Income Taxes

Income taxes are computed using the asset and liability method, under which deferred tax assets and liabilities are determined based on the difference between the financial statement and tax bases of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to affect taxable income. Valuation allowances are established when necessary to reduce deferred tax assets to the amount expected to be realized.

We record liabilities related to uncertain tax positions when, despite our belief that our tax return positions are supportable, we believe that it is more likely than not that those positions may not be fully sustained upon review by tax authorities. Accrued interest and penalties related to unrecognized tax benefits are classified as income tax expense.

Comprehensive Income (Loss)

Comprehensive income (loss) is comprised of net income (loss) and other comprehensive income (loss). Other comprehensive income (loss) consists of unrealized gains and losses on cash flow hedges and available-for-sale marketable securities and foreign currency translation adjustments that have been excluded from the determination of net income (loss).

Stock-Based Compensation

We recognize compensation expense for costs related to all share-based payments, including stock options, restricted stock units (“RSUs”) and our employee stock purchase plan (the “ESPP”). The fair value of stock option awards with only service conditions and the ESPP is estimated on the grant or offering date using the Black-Scholes option-pricing model. The fair value of RSUs is measured on the grant date based on the closing fair market value of our common stock. Stock-based compensation expense is recognized on a straight-line basis over the requisite service period, net of

actual forfeitures in the period (prior to 2017, net of estimated projected forfeitures). Stock-based compensation associated with awards assumed from the acquisition of SolarCity Corporation ("SolarCity") is measured as of the acquisition date using the relevant assumptions and recognized on a straight-line basis over the remaining requisite service period, net of actual forfeitures in the period (prior to 2017, net of estimated projected forfeitures).

For performance-based awards, stock-based compensation expense is recognized over the expected performance achievement period of individual performance milestones when the achievement of each individual performance milestone becomes probable. For performance-based awards with a vesting schedule based entirely on the attainment of both performance and market conditions, stock-based compensation expense is recognized for each pair of performance and market conditions over the longer of the expected achievement period of the performance and market conditions, beginning at the point in time that the relevant performance condition is considered probable of achievement. The fair value of such awards is estimated on the grant date using Monte Carlo simulations (see Note 15, Equity Incentive Plans).

As we accumulate additional employee stock-based awards data over time and as we incorporate market data related to our common stock, we may calculate significantly different volatilities and expected lives, which could materially impact the valuation of our stock-based awards and the stock-based compensation expense that we will recognize in future periods. Stock-based compensation expense is recorded in cost of revenues, research and development expense and selling, general and administrative expense in the consolidated statements of operations.

Noncontrolling Interests and Redeemable Noncontrolling Interests

Noncontrolling interests and redeemable noncontrolling interests represent third-party interests in the net assets under certain funding arrangements, or funds, that we enter into to finance the costs of solar energy systems and vehicles under operating leases. We have determined that the contractual provisions of the funds represent substantive profit sharing arrangements. We have further determined that the appropriate methodology for calculating the noncontrolling interest and redeemable noncontrolling interest balances that reflects the substantive profit sharing arrangements is a balance sheet approach using the hypothetical liquidation at book value (“HLBV”) method. We, therefore, determine the amount of the noncontrolling interests and redeemable noncontrolling interests in the net assets of the funds at each balance sheet date using the HLBV method, which is presented on the consolidated balance sheet as noncontrolling interests in subsidiaries and redeemable noncontrolling interests in subsidiaries. Under the HLBV method, the amounts reported as noncontrolling interests and redeemable noncontrolling interests in the consolidated balance sheet represent the amounts the third-parties would hypothetically receive at each balance sheet date under the liquidation provisions of the funds, assuming the net assets of the funds were liquidated at their recorded amounts determined in accordance with GAAP and with tax laws effective at the balance sheet date and distributed to the third-parties. The third-parties’ interests in the results of operations of the funds are determined as the difference in the noncontrolling interest and redeemable noncontrolling interest balances in the consolidated balance sheets between the start and end of each reporting period, after taking into account any capital transactions between the funds and the third-parties. However, the redeemable noncontrolling interest balance is at least equal to the redemption amount. The redeemable noncontrolling interest balance is presented as temporary equity in the mezzanine section of the consolidated balance sheet since these third-parties have the right to redeem their interests in the funds for cash or other assets.

Net Income (Loss) per Share of Common Stock Attributable to Common Stockholders

Basic net income (loss) per share of common stock attributable to common stockholders is calculated by dividing net income (loss) attributable to common stockholders by the weighted-average shares of common stock outstanding for the period. Potentially dilutive shares, which are based on the weighted-average shares of common stock underlying outstanding stock-based awards, warrants and convertible senior notes using the treasury stock method or the if-converted method, as applicable, are included when calculating diluted net income (loss) per share of common stock attributable to common stockholders when their effect is dilutive. Since we intend to settle in cash the principal outstanding under the 0.25% Convertible Senior Notes due in 2019, the 1.25% Convertible Senior Notes due in 2021 and the 2.375% Convertible Senior Notes due in 2022, we use the treasury stock method when calculating their potential dilutive effect, if any. Furthermore, in connection with the offerings of our bond hedges, we entered into

convertible note hedges (see Note 13, Long-Term Debt Obligations). However, our convertible note hedges are not included when calculating potentially dilutive shares since their effect is always anti-dilutive.

The following table presents the potentially dilutive shares that were excluded from the computation of diluted net income (loss) per share of common stock attributable to common stockholders, because their effect was anti-dilutive:

	Year Ended December 31,		
	2018	2017	2016
Stock-based awards	9,928,789	10,456,363	12,091,473
Convertible senior notes	1,432,656	2,315,463	841,191
Warrants	214,213	579,137	262,702

Business Combinations

We account for business acquisitions under ASC 805, Business Combinations. The total purchase consideration for an acquisition is measured as the fair value of the assets given, equity instruments issued and liabilities assumed at the acquisition date. Costs that are directly attributable to the acquisition are expensed as incurred. Identifiable assets (including intangible assets), liabilities assumed (including contingent liabilities) and noncontrolling interests in an acquisition are measured initially at their fair values at the acquisition date. We recognize goodwill if the fair value of the total purchase consideration and any noncontrolling interests is in excess of the net fair value of the identifiable assets acquired and the liabilities assumed. We recognize a bargain purchase gain within other income (expense), net, on the consolidated statement of operations if the net fair value of the identifiable assets acquired and the liabilities assumed is in excess of the fair value of the total purchase consideration and any noncontrolling interests. We include the results of operations of the acquired business in the consolidated financial statements beginning on the acquisition date.

Cash and Cash Equivalents

All highly liquid investments with an original maturity of three months or less at the date of purchase are considered cash equivalents. Our cash equivalents are primarily comprised of money market funds.

Restricted Cash

We maintain certain cash balances restricted as to withdrawal or use. Our restricted cash is comprised primarily of cash as collateral for our sales to lease partners with a resale value guarantee, letters of credit, real estate leases, insurance policies, credit card borrowing facilities and certain operating leases. In addition, restricted cash includes cash received from certain fund investors that have not been released for use by us and cash held to service certain payments under various secured debt facilities.

The following table totals cash and cash equivalents and restricted cash as reported on the consolidated balance sheets; the sums are presented in the consolidated statements of cash flows (in thousands):

	December 31, 2018	December 31, 2017	December 31, 2016	December 31, 2015
Cash and cash equivalents	$ 3,685,618	$ 3,367,914	$ 3,393,216	$ 1,196,908

Restricted cash (1)	192,551	155,323	105,519	5,961
Restricted cash, net of current portion	398,219	441,722	268,165	31,522
Total as presented in the consolidated statements of cash flows	$ 4,276,388	$ 3,964,959	$ 3,766,900	$ 1,234,391

(1) In the consolidated balance sheet as of December 31, 2015, the restricted cash and marketable securities balance of $22.6 million included $16.7 million of marketable securities. This balance of marketable securities has been excluded in the table above.

Accounts Receivable and Allowance for Doubtful Accounts

Accounts receivable primarily include amounts related to sales of powertrain systems, sales of energy generation and storage products, receivables from financial institutions and leasing companies offering various financing products to our customers, sales of regulatory credits to other automotive manufacturers and maintenance services on vehicles owned by leasing companies. We provide an allowance against accounts receivable to the amount we reasonably believe will be collected. We write-off accounts receivable when they are deemed uncollectible.

We typically do not carry significant accounts receivable related to our vehicle and related sales as customer payments are due prior to vehicle delivery, except for amounts due from commercial financial institutions for approved financing arrangements between our customers and the financial institutions.

MyPower Customer Notes Receivable

We have customer notes receivable under the legacy MyPower loan program. MyPower was offered by SolarCity to provide residential customers with the option to finance the purchase of a solar energy system through a 30-year loan. The outstanding balances, net of any allowance for potentially uncollectible amounts, are presented on the consolidated balance sheet as a component of prepaid expenses and other current assets for the current portion and as MyPower customer notes receivable, net of current portion, for the long-term portion. In determining the allowance and credit quality for customer notes receivable, we identify significant customers with known disputes or collection issues and also consider our historical level of credit losses and current economic trends that might impact the level of future credit losses. Customer notes receivable that are individually impaired are charged-off as a write-off of the allowance for losses. Since acquisition, there have been no new significant customers with known disputes or collection issues, and the amount of potentially uncollectible amounts has been insignificant. In addition, there were no material non-accrual or past due customer notes receivable as of December 31, 2018.

Concentration of Risk

Credit Risk

Financial instruments that potentially subject us to a concentration of credit risk consist of cash, cash equivalents, restricted cash, accounts receivable, convertible note hedges, and interest rate swaps. Our cash balances are primarily invested in money market funds or on deposit at high credit quality financial institutions in the U.S. These deposits are typically in excess of insured limits. As of December 31, 2018 and 2017, no entity represented 10% or more of our total accounts receivable balance. The risk of concentration for our interest rate swaps is mitigated by transacting with several highly-rated multinational banks.

Supply Risk

We are dependent on our suppliers, the majority of which are single source suppliers, and the inability of these suppliers to deliver necessary components of our products in a timely manner at prices, quality levels and volumes acceptable to us, or our inability to efficiently manage these components from these suppliers, could have a material adverse effect on our business, prospects, financial condition and operating results.

Inventory Valuation

Inventories are stated at the lower of cost or net realizable value. Cost is computed using standard cost for vehicles and energy storage products, which approximates actual cost on a first-in, first-out basis. In addition, cost for solar energy systems is recorded using actual cost. We record inventory write-downs for excess or obsolete inventories

based upon assumptions about on current and future demand forecasts. If our inventory on-hand is in excess of our future demand forecast, the excess amounts are written-off.

We also review our inventory to determine whether its carrying value exceeds the net amount realizable upon the ultimate sale of the inventory. This requires us to determine the estimated selling price of our vehicles less the estimated cost to convert the inventory on-hand into a finished product. Once inventory is written-down, a new, lower cost basis for that inventory is established and subsequent changes in facts and circumstances do not result in the restoration or increase in that newly established cost basis.

Should our estimates of future selling prices or production costs change, additional and potentially material increases to this reserve may be required. A small change in our estimates may result in a material charge to our reported financial results.

Operating Lease Vehicles

Vehicles that are leased as part of our direct vehicle leasing program, vehicles delivered to leasing partners with a resale value guarantee and a buyback option, as well as vehicles delivered to customers with resale value guarantee where exercise is probable are classified as operating lease vehicles as the related revenue transactions are treated as operating leases (refer to the Automotive Leasing Revenue section above for details). Operating lease vehicles are recorded at cost less accumulated depreciation. Depreciation is computed using the straight-line method over the expected operating lease term. The total cost of operating lease vehicles recorded on the consolidated balance sheets as of December 31, 2018 and 2017 was $2.55 billion and $4.85 billion, respectively. Accumulated depreciation related to leased vehicles as of December 31, 2018 and 2017 was $457.6 million and $733.3 million, respectively.

Solar Energy Systems, Leased and To Be Leased

We are the lessor of solar energy systems under leases that qualify as operating leases. Our leases are accounted for in accordance with ASC 840. To determine lease classification, we evaluate the lease terms to determine whether there is a transfer of ownership or bargain purchase option at the end of the lease, whether the lease term is greater than 75% of the useful life or whether the present value of the minimum lease payments exceed 90% of the fair value at lease inception. We utilize periodic appraisals to estimate useful lives and fair values at lease inception and residual values at lease termination. Solar energy systems are stated at cost less accumulated depreciation.

Depreciation and amortization is calculated using the straight-line method over the estimated useful lives of the respective assets, as follows:

Solar energy systems leased to customers	30 to 35 years
Initial direct costs related to customer solar energy system lease acquisition costs	Lease term (up to 25 years)

Solar energy systems held for lease to customers are installed systems pending interconnection with the respective utility companies and will be depreciated as solar energy systems leased to customers when they have been interconnected and placed in-service. Solar energy systems under construction represents systems that are under installation, which will be depreciated as solar energy systems leased to customers when they are completed, interconnected and leased to customers. Initial direct costs related to customer solar energy system lease acquisition costs are capitalized and amortized over the term of the related customer lease agreements.

Property, Plant and Equipment

Property, plant and equipment, including leasehold improvements, are recognized at cost less accumulated depreciation. Depreciation is generally computed using the straight-line method over the estimated useful lives of the respective assets, as follows:

Machinery, equipment, vehicles and office furniture	2 to 12 years
Building and building improvements	15 to 30 years
Computer equipment and software	3 to 10 years

Depreciation for tooling is computed using the units-of-production method whereby capitalized costs are amortized over the total estimated productive life of the respective assets. As of December 31, 2018, the estimated productive life for Model S and Model X tooling was 325,000 vehicles based on our current estimates of production. As of December 31, 2018, the estimated productive life for Model 3 tooling was 1,000,000 vehicles based on our current estimates of production.

Leasehold improvements are depreciated on a straight-line basis over the shorter of their estimated useful lives or the terms of the related leases.

Upon the retirement or sale of our property, plant and equipment, the cost and associated accumulated depreciation are removed from the consolidated balance sheet, and the resulting gain or loss is reflected on the consolidated statement of operations. Maintenance and repair expenditures are expensed as incurred while major improvements that increase the functionality, output or expected life of an asset are capitalized and depreciated ratably over the identified useful life.

Interest expense on outstanding debt is capitalized during the period of significant capital asset construction. Capitalized interest on construction-in-progress is included within property, plant and equipment and is amortized over the life of the related assets.

Furthermore, we are deemed to be the owner, for accounting purposes, during the construction phase of certain long-lived assets under build-to-suit lease arrangements because of our involvement with the construction, our exposure to any potential cost overruns or our other commitments under the arrangements. In these cases, we recognize build-to-suit lease assets under construction and corresponding build-to-suit lease liabilities on the consolidated balance sheet, in accordance with ASC 840. Once construction is completed, if a lease meets certain "sale-leaseback" criteria, we remove the asset and liability and account for the lease as an operating lease. Otherwise, the lease is accounted for as a capital lease.

Long-Lived Assets Including Acquired Intangible Assets

We review our property, plant and equipment, long-term prepayments and intangible assets for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset (or asset group) may not be recoverable. We measure recoverability by comparing the carrying amount to the future undiscounted cash flows that the asset is expected to generate. If the asset is not recoverable, its carrying amount would be adjusted-down to its fair value. For the year ended December 31, 2018, we have recognized certain material impairments of our long-lived assets (refer to Note 4, Intangible Assets, for further details). For the years ended December 31, 2017 and 2016, we have recognized no material impairments of our long-lived assets.

Intangible assets with definite lives are amortized on a straight-line basis over their estimated useful lives, which range from two to thirty years.

Capitalization of Software Costs

For costs incurred in development of internal use software, we capitalize costs incurred during the application development stage. Costs related to preliminary project activities and post-implementation activities are expensed as incurred. Internal use software is amortized on a straight-line basis over its estimated useful life of three to ten years. We evaluate the useful lives of these assets on an annual basis, and we test for impairment whenever events or changes in circumstances occur that could impact the recoverability of these assets.

Foreign Currency

We determine the functional and reporting currency of each of our international subsidiaries and their operating divisions based on the primary currency in which they operate. In cases where the functional currency is not the U.S. dollar, we recognize a cumulative translation adjustment created by the different rates we apply to accumulated deficits, including current period income or loss, and the balance sheet. For each subsidiary, we apply the monthly average functional currency rate to its income or loss and the month-end functional currency rate to translate the

balance sheet.

Foreign currency transaction gains and losses are a result of the effect of exchange rate changes on transactions denominated in currencies other than the functional currency. Transaction gains and losses are recognized in other income (expense), net, in the consolidated statement of operations. For the years ended December 31, 2018, 2017 and 2016, we recorded foreign currency transaction gains of $1.5 million, losses of $52.3 million and gains of $26.1 million, respectively.

Warranties

We provide a manufacturer's warranty on all new and used vehicles, production powertrain components and systems and energy storage products we sell. In addition, we also provide a warranty on the installation and components of the solar energy systems we sell for periods typically between 10 to 30 years. We accrue a warranty reserve for the products sold by us, which includes our best estimate of the projected costs to repair or replace items under warranties and recalls when identified. These estimates are based on actual claims incurred to date and an estimate of the nature, frequency and costs of future claims. These estimates are inherently uncertain given our relatively short history of sales, and changes to our historical or projected warranty experience may cause material changes to the warranty reserve in the future. The warranty reserve does not include projected warranty costs associated with our vehicles subject to lease accounting and our solar energy systems under lease contracts or PPAs, as the costs to repair these warranty claims are expensed as incurred. The portion of the warranty reserve expected to be incurred within the next 12 months is included within accrued liabilities and other while the remaining balance is included within other long-term liabilities on the consolidated balance sheet. Due to the adoption of the new revenue standard, automotive sales with resale value guarantees that were previously recorded within operating lease assets require a corresponding warranty accrual, which is included in the table below. Warranty expense is recorded as a component of cost of revenues in the consolidated statements of operations. Accrued warranty activity consisted of the following (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Accrued warranty—beginning of period	$401,790	$266,655	$180,754
Assumed warranty liability from acquisition	—	4,737	31,366
Warranty costs incurred	(209,124)	(122,510)	(79,147)
Net changes in liability for pre-existing warranties, including expirations and foreign exchange impact	(26,294)	4,342	(20,084)
Additional warranty accrued from adoption of the new revenue standard	37,139	—	—
Provision for warranty	544,315	248,566	153,766
Accrued warranty—end of period	$747,826	$401,790	$266,655

For the years ended December 31, 2018, 2017, and 2016, warranty costs incurred for vehicles accounted for as operating leases or collateralized debt arrangements were $21.9 million, $35.5 million and $19.0 million, respectively.

Solar Energy System Performance Guarantees

We guarantee a specified minimum solar energy production output for certain solar energy systems leased or sold to customers, generally for a term of up to 30 years. We monitor the solar energy systems to ensure that these outputs are being achieved. We evaluate if any amounts are due to our customers and make any payments periodically as specified in the customer agreements. As of December 31, 2018 and 2017, we had recognized a liability of $7.5 million and $6.3 million, respectively, within accrued liabilities and other on the consolidated balance sheets, related to these guarantees based on our assessment of the exposures.

Solar Renewable Energy Credits

We account for solar renewable energy credits ("SRECs") when they are purchased by us or sold to third-parties. For SRECs generated by solar energy systems owned by us and minted by government agencies, we do not recognize any specifically identifiable costs as there are no specific incremental costs incurred to generate the SRECs. For SRECs purchased by us, we record these SRECs at their cost, subject to impairment testing. We recognize revenue from the sale of an SREC when the SREC is transferred to the buyer, and the cost of the SREC, if any, is then recorded to cost of revenue.

Deferred Investment Tax Credit Revenue

We have solar energy systems that are eligible for ITCs that accrue to eligible property under the Internal Revenue Code ("IRC"). Under Section 50(d)(5) of the IRC and the related regulations, a lessor of qualifying property may elect to treat the lessee as the owner of such property for the purposes of claiming the ITCs associated with such property. These regulations enable the ITCs to be separated from the ownership of the property and allow the transfer of the ITCs. Under our lease pass-through fund arrangements, we can make a tax election to pass-through the ITCs to the investors, who are the legal lessee of the property. Therefore, we are able to monetize these ITCs to the investors who can utilize them in return for cash payments. We consider the monetization of ITCs to constitute one of the key elements of realizing the value associated with solar energy systems. Consequently, we consider the proceeds from the monetization of ITCs to be a component of revenue generated from solar energy systems.

In accordance with the relevant FASB guidance, we recognize revenue from the monetization of ITCs when (1) persuasive evidence of an arrangement exists, (2) delivery has occurred or services have been rendered, (3) the sales price is fixed or determinable and (4) collection of the related receivable is reasonably assured. An ITC is subject to recapture under the IRC if the underlying solar energy system either ceases to be a qualifying property or undergoes a change in ownership within five years of its placed-in-service date; the recapture amount decreases on each anniversary of the placed-in-service date. Since we have an obligation to ensure that the solar energy system is in-service and operational for a term of five years in order to avoid any recapture of the ITC, we recognize revenue as the recapture amount decreases, assuming the other revenue recognition criteria above have been met. As a result, the monetized ITC is initially recorded as deferred revenue on the consolidated balance sheets, and subsequently, one-fifth of the monetized ITC is recognized as energy generation and storage revenue on the consolidated statement of operations on each anniversary of the solar energy system's placed-in-service date over five years. As discussed in the Revenue Recognition section above, following the adoption of the new revenue standard on January 1, 2018, we no longer defer the monetized ITC as deferred revenue outstanding and have reclassified all ITC deferred revenue as of December 31, 2017 to our opening accumulated deficit.

We indemnify the investors for any recapture of ITCs due to our non-compliance. We have concluded that the likelihood of a recapture event is remote, and consequently, we have not recognized a liability for this indemnification on the consolidated balance sheets.

Nevada Tax Incentives

We have entered into agreements with the State of Nevada and Storey County in Nevada that provide abatements for sales, use, real property, personal property and employer excise taxes, discounts to the base tariff energy rates and transferable tax credits. These incentives are available for the applicable periods beginning on October 17, 2014 and ending on either June 30, 2024 or June 30, 2034 (depending on the incentive). Under these agreements, we were eligible for a maximum of $195.0 million of transferable tax credits, subject to capital investments by us and our partners for Gigafactory 1 of at least $3.50 billion, which we exceeded during 2017, and specified hiring targets for Gigafactory 1, which we exceeded during 2018. We record these credits as earned when we have evidence there is a market for their sale. Credits are applied as a cost offset to either employee expense or to capital assets, depending on the source of the credits. Credits earned from employee hires or capital spending by our partners at Gigafactory 1 are recorded as a reduction to operating expenses. As of December 31, 2018 and 2017, we had earned $195.0 million and $163.0 million of transferable tax credits under these agreements, respectively.

Recent Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board ("FASB") issued ASU No. 2014-09, Revenue from Contracts with Customers, to replace the existing revenue recognition criteria for contracts with customers. In August 2015, the FASB issued ASU No. 2015-14, Deferral of the Effective Date, to defer the effective date of ASU No. 2014-09 to interim and annual periods beginning after December 15, 2017. Subsequently, the FASB issued ASU No. 2016-08, Principal versus Agent Considerations, ASU No. 2016-10, Identifying Performance Obligations and Licensing, ASU No. 2016-11, Rescission of SEC Guidance Because of Accounting Standards Updates 2014-09 and 2014-16 Pursuant to Staff Announcements at the March 3, 2016 EITF Meeting, ASU No. 2016-12, Narrow-Scope Improvements and Practical Expedients, and ASU No. 2016-20, Technical Corrections and Improvements, to clarify and amend the guidance in ASU No. 2014-09. We adopted the ASUs on January 1, 2018 on a modified retrospective basis through a cumulative adjustment to accumulated deficit. The adoption of the ASUs changed the timing of revenue recognition to be at delivery for certain vehicle sales to customers or leasing partners with a resale value guarantee, which now qualify to be accounted for as sales with a right of return as opposed to the prior accounting as operating leases or collateralized lease borrowings. Upon adoption of the ASUs, we recorded a decrease to our beginning accumulated deficit of $623.2 million including income tax effects, which were immaterial. Refer to the Revenue Recognition section above for details.

In February 2016, the FASB issued ASU No. 2016-02, Leases, to require lessees to recognize all leases, with limited exceptions, on the balance sheet, while recognition on the statement of operations will remain similar to current lease accounting. The ASU also eliminates real estate-specific provisions and modifies certain aspects of lessor accounting. Subsequently, the FASB issued ASU No. 2018-10, Codification Improvements to Topic 842, ASU No. 2018-11, Targeted Improvements, and ASU No. 2018-20, Narrow-Scope Improvements for Lessors, to clarify and amend the guidance in ASU No. 2016-02. The ASUs are effective for interim and annual periods beginning after December 15, 2018, with early adoption permitted. We will adopt the ASUs on January 1, 2019 on a modified retrospective basis through a cumulative adjustment to our beginning accumulated deficit balance. Prior comparative periods will not be restated under this method, and we will adopt all available practical expedients, as applicable. Further, solar leases that commence on or after January 1, 2019, where we are the lessor and which are currently accounted for as leases, will no longer meet the definition of a lease. Instead, solar leases commencing on or after January 1, 2019 will be accounted for under ASC 606. In addition to recognizing operating leases that were previously not recognized on the consolidated balance sheet, we also expect most of our build-to-suit leases to be de-recognized with a net decrease of approximately of $100.0 million to our beginning accumulated deficit before income tax effects, as our build-to-suit leases will no longer qualify for build-to-suit accounting and will instead be recognized as operating leases or finance leases. Upon adoption, our consolidated balance sheet will include an overall reduction in assets in the range of approximately $400.0 million to $500.0 million and a reduction in liabilities in the range of approximately $500.0 million to $600.0 million. The ASUs are not expected to have a material impact on the consolidated statement of operations or the consolidated statement of cash flows.

In June 2016, the FASB issued ASU No. 2016-13, Measurement of Credit Losses on Financial Instruments, to require financial assets carried at amortized cost to be presented at the net amount expected to be collected based on historical experience, current conditions and forecasts. Subsequently, the FASB issued ASU No. 2018-19, Codification Improvements to Topic 326, to clarify that receivables arising from operating leases are within the scope of lease accounting standards. The ASUs are effective for interim and annual periods beginning after December 15, 2019, with early adoption permitted. Adoption of the ASUs is modified retrospective. We are currently obtaining an understanding of the ASUs and plan to adopt them on January 1, 2020.

In August 2016, the FASB issued ASU No. 2016-15, Classification of Certain Cash Receipts and Cash Payments, to reduce the diversity in practice with respect to the classification of certain cash receipts and cash payments on the statement of cash flows. The ASU is effective for interim and annual periods beginning after December 15, 2017.

Adoption of the ASU is retrospective. We adopted the ASU on January 1, 2018, which did not have a material impact on the consolidated financial statements.

In November 2016, the FASB issued ASU No. 2016-18, Statement of Cash Flows: Restricted Cash, which requires entities to present the aggregate changes in cash, cash equivalents, restricted cash and restricted cash equivalents in the statement of cash flows. As a result, the statement of cash flows now presents restricted cash and restricted cash equivalents as a part of the beginning and ending balances of cash and cash equivalents. The ASU is effective for interim and annual periods beginning after December 15, 2017. Adoption of the ASU is retrospective. We adopted the ASU on January 1, 2018, which resulted in restricted cash being combined with unrestricted cash reconciling beginning and ending balances. Refer to the Restricted Cash section for the reconciliation.

In January 2017, the FASB issued ASU No. 2017-01, Clarifying the Definition of a Business, to clarify which transactions should be accounted for as acquisitions (or disposals) of assets or businesses. The ASU is effective for interim and annual periods beginning after December 15, 2017. Adoption of the ASU is prospective. We adopted the ASU on January 1, 2018, which did not have a material impact on the consolidated financial statements.

In January 2017, the FASB issued ASU No. 2017-04, Simplifying the Test for Goodwill Impairment, to simplify the test for goodwill impairment by removing Step 2. An entity will, therefore, perform the goodwill impairment test by comparing the fair value of a reporting unit with its carrying amount and recognizing an impairment charge for the amount by which the carrying amount exceeds the fair value, not to exceed the total amount of goodwill allocated to the reporting unit. An entity still has the option to perform a qualitative assessment to determine if the quantitative impairment test is necessary. The ASU is effective for interim and annual periods beginning after December 15, 2019, with early adoption permitted. Adoption of the ASU is prospective. We have not yet selected an adoption date, though the ASU is currently not expected to have a material impact on the consolidated financial statements.

In February 2017, the FASB issued ASU No. 2017-05, Gains and Losses from the Recognition of Nonfinancial Assets, to clarify the scope of asset derecognition guidance and accounting for partial sales of nonfinancial assets. The ASU is effective for interim and annual periods beginning after December 15, 2017. We adopted the ASU on January 1, 2018 on a modified retrospective basis through a cumulative adjustment to accumulated deficit. Upon adoption of the ASU, we recorded a $9.4 million decrease to our beginning accumulated deficit balance.

In May 2017, the FASB issued ASU No. 2017-09, Scope of Modification Accounting, to provide guidance on which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting. The ASU is effective for interim and annual periods beginning after December 15, 2017. Adoption of the ASU is prospective. We adopted the ASU on January 1, 2018, which did not have a material impact on the consolidated financial statements.

In August 2017, the FASB issued ASU No. 2017-12, Targeted Improvements to Accounting for Hedging Activities, to simplify the application of current hedge accounting guidance. The ASU expands and refines hedge accounting for both non-financial and financial risk components and aligns the recognition and presentation of the effects of the hedging instrument and the hedged item in the financial statements. The ASU is effective for interim and annual periods beginning after December 15, 2018, with early adoption permitted. Adoption of the ASU will be prospective for us. We plan to adopt the ASU on January 1, 2019, and the ASU is currently not expected to have a material impact on the consolidated financial statements.

In January 2018, the FASB issued ASU No. 2018-01, Land Easement Practical Expedient Transition to Topic 842, to permit an entity to elect a practical expedient to not re-evaluate land easements that existed or expired before the entity’s adoption of ASU No. 2016-02, Leases, and that are not currently accounted for as leases. The ASU is effective for the same periods as ASU No. 2016-02, and the ASU will not have a material impact on the consolidated financial statements.

In August 2018, the FASB issued ASU No. 2018-15, Customer’s Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement that Is a Service Contract. The ASU aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangements that include an internal-use software license). The ASU is effective for interim and annual periods beginning after December 15, 2019, with early adoption permitted. Adoption of the ASU is either retrospective or prospective. We are currently obtaining an understanding of the ASU and plan to adopt the ASU prospectively on January 1, 2020.

Note 3 – Business Combinations

Grohmann Acquisition

On January 3, 2017, we completed our acquisition of Grohmann Engineering GmbH (now Tesla Grohmann Automation GmbH or "Grohmann"), which specializes in the design, development and sale of automated manufacturing systems, for $109.5 million in cash. We acquired Grohmann to improve the speed and efficiency of our manufacturing processes.

At the time of acquisition, we entered into an incentive compensation arrangement for up to a maximum of $25.8 million of payments contingent upon continued service with us for 36 months after the acquisition date. Such payments would have been accounted for as compensation expense in the periods earned. However, during the three months ended March 31, 2017, we terminated the incentive compensation arrangement and accelerated the payments thereunder. As a result, we recorded the entire $25.8 million as compensation expense in the three months ended March 31, 2017, which was included within selling, general and administrative expense in the consolidated statements of operations.

Fair Value of Assets Acquired and Liabilities Assumed

Fair value estimates are based on a complex series of judgments about future events and uncertainties and rely heavily on estimates and assumptions. The judgments used to determine the estimated fair value assigned to each class of assets acquired and liabilities assumed, as well as asset lives and the expected future cash flows and related discount rates, can materiality impact our results of operations. Significant inputs used included the amount of cash flows, the expected period of the cash flows and the discount rates. During the fourth quarter of 2017, we finalized our estimate of the acquisition date fair values of the assets acquired and the liabilities assumed. Prior to finalization, there were no changes to the fair values of the assets acquired and the liabilities assumed.

The allocation of the purchase consideration was based on management's estimate of the acquisition date fair values of the assets acquired and the liabilities assumed, as follows (in thousands):

Assets acquired:	
Cash and cash equivalents	$334
Accounts receivable	42,947
Inventory	10,031
Property, plant and equipment	44,030
Intangible assets	21,723
Prepaid expenses and other assets, current and non-current	1,998
Total assets acquired	121,063
Liabilities assumed:	
Accounts payable	(19,975)
Accrued liabilities	(12,403)
Debt and capital leases, current and non-current	(9,220)
Other long-term liabilities	(10,049)
Total liabilities assumed	(51,647)
Net assets acquired	69,416
Goodwill	40,065
Total purchase price	$109,481

Goodwill represented the excess of the purchase price over the fair value of the net assets acquired and was primarily attributable to the expected synergies from potential monetization opportunities and from integrating Grohmann's technology into our automotive business as well as the acquired talent. Goodwill is not deductible for U.S. income tax purposes and is not amortized. Rather, we assess goodwill for impairment annually in the fourth quarter, or more frequently if events or changes in circumstances indicate that it might be impaired, by comparing its carrying value to the reporting unit's fair value.

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Identifiable Intangible Assets Acquired

The determination of the fair values of the identified intangible assets and their respective useful lives as of the acquisition date was as follows (in thousands, except for useful lives):

	Fair Value	Useful Life (in years)
Developed technology	$12,528	10
Software	3,341	3
Customer relations	3,236	6
Trade name	1,775	7
Other	843	2
Total intangible assets	$21,723	

Grohmann's results of operations since the acquisition date have been included within the automotive segment in the consolidated statements of operations. Standalone and pro forma results of operations have not been presented because they were not material to the consolidated financial statements.

SolarCity Acquisition

On November 21, 2016 (the "Acquisition Date"), we completed our acquisition of SolarCity. Pursuant to the Agreement and Plan of Merger (the "Merger Agreement"), each issued and outstanding share of SolarCity common stock was converted into 0.110 (the "Exchange Ratio") shares of our common stock. In addition, SolarCity's stock option awards and restricted stock unit awards were assumed by us and converted into corresponding equity awards in respect of our common stock based on the Exchange Ratio, with the awards retaining the same vesting and other terms and conditions as in effect immediately prior to the acquisition.

Fair Value of Purchase Consideration

The Acquisition Date fair value of the purchase consideration was as follows (in thousands, except for share and per share amounts):

Total fair value of Tesla common stock issued (11,124,497 shares issued at $185.04 per share)	$2,058,477
Fair value of replacement Tesla stock options and restricted stock units for vested SolarCity awards	87,500
Total purchase price	$2,145,977

Furthermore, the assumed unvested SolarCity awards of $95.9 million are recognized as stock-based compensation expense over the remaining requisite service period. Per ASC 805, the replacement of stock options or other

share-based payment awards in conjunction with a business combination represents a modification of share-based payment awards that must be accounted for in accordance with ASC 718, Stock Compensation. As a result of our issuance of replacement awards, a portion of the fair-value-based measure of the replacement awards is included in the purchase consideration. To determine the portion of the replacement awards that is part of the purchase consideration, we measured the fair value of both the replacement awards and the historical awards as of the Acquisition Date. The fair value of the replacement awards, whether vested or unvested, was included in the purchase consideration to the extent that pre-acquisition services were rendered.

Transaction costs of $21.7 million were expensed as incurred to selling, general and administrative expense on the consolidated statements of operations.

Fair Value of Assets Acquired and Liabilities Assumed

Fair value estimates are based on a complex series of judgments about future events and uncertainties and rely heavily on estimates and assumptions. The judgments used to determine the estimated fair value assigned to each class of assets acquired and liabilities assumed, as well as asset lives and the expected future cash flows and related discount rates, can materiality impact our results of operations. Specifically, we utilized a discounted cash flow model to value the acquired solar energy systems, leased and to be leased, as well as the noncontrolling interests in subsidiaries. Significant inputs used included the amount of cash flows, the expected period of the cash flows and the discount rates.

The allocation of the purchase consideration was based on management's estimate of the Acquisition Date fair values of the assets acquired and the liabilities assumed, as follows (in thousands):

Assets acquired:	
Cash and cash equivalents	$213,523
Accounts receivable	74,619
Inventory	191,878
Solar energy systems, leased and to be leased	5,781,496
Property, plant and equipment	1,056,312
MyPower customer notes receivable, net of current portion	498,141
Restricted cash	129,196
Intangible assets	356,510
Prepaid expenses and other assets, current and non-current	199,864
Total assets acquired	8,501,539
Liabilities assumed:	
Accounts payable	(230,078)
Accrued liabilities	(284,765)
Debt and capital leases, current and non-current	(3,403,840)
Financing obligations	(121,290)
Deferred revenue, current and non-current	(271,128)
Other liabilities	(950,423)
Total liabilities assumed	(5,261,524)
Net assets acquired	3,240,015
Noncontrolling interests redeemable and non-redeemable	(1,066,517)
Capped call options associated with 2014 convertible notes	3,460
Total net assets acquired	2,176,958
Gain on acquisition	(30,981)
Total purchase price	$2,145,977

Gain on Acquisition

Since the fair value of the net assets acquired was greater than the purchase price, we recognized a gain on acquisition of $88.7 million in the fourth quarter of 2016, which was recorded within other income (expense), net, on the consolidated statements of operations.

During the fourth quarter of 2017, we finalized our estimate of the Acquisition Date fair values of the assets acquired and the liabilities assumed. Prior to finalization, during the year ended December 31, 2017, we recorded an $11.6 million measurement period adjustment to MyPower customer notes receivable, net of current portion, and a

$46.2 million measurement period adjustment to accrued liabilities. The measurement period adjustments were recorded as losses to other income (expense), net, in the consolidated statement of operations and reduced the gain on acquisition initially recognized in the fourth quarter of 2016.

Identifiable Intangible Assets Acquired

The determination of the fair values of the identified intangible assets and their respective useful lives as of the Acquisition Date was as follows (in thousands, except for useful lives):

	Fair Value	Useful Life (in years)
Developed technology	$113,361	7
Trade name (1)	43,500	3
Favorable contracts and leases, net	112,817	15
IPR&D	86,832	Not applicable
Total intangible assets	$356,510	

(1) Refer to Note 4, Intangible Assets, for discussion over changes to the assumptions of the useful life of this asset post acquisition.

Unaudited Pro Forma Financial Information

The consolidated financial statements for the year ended December 31, 2016 include SolarCity's results of operations from the Acquisition Date through December 31, 2016. Net revenues and operating loss attributable to SolarCity during this period and included in the consolidated statement of operations were $84.1 million and $68.2 million, respectively.

The following unaudited pro forma financial information for the year ended December 31, 2016 gives effect to our acquisition of SolarCity as if the acquisition had occurred on January 1, 2015 (in thousands, except per share data):

Revenue	$7,536,876
Net loss attributable to common stockholders	(702,868)
Net loss per share of common stock, basic and diluted	$(4.56)
Weighted-average shares used in computing net loss per share of common stock, basic and diluted	154,090

The unaudited pro forma financial information includes adjustments for the depreciation of solar energy systems, leased and to be leased, the intangible assets acquired, the effect of the acquisition on deferred revenue and noncontrolling interests and the transaction costs related to the acquisition. The unaudited pro forma financial information is presented for illustrative purposes only and is not necessarily indicative of the results of operations of future periods. The unaudited pro forma financial information does not give effect to the potential impact of current financial conditions, regulatory matters, synergies, operating efficiencies or cost savings that might be associated with the acquisition. Consequently, actual results could differ from the unaudited pro forma financial information presented.

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Note 4 – Intangible Assets

Information regarding our acquired intangible assets was as follows (in thousands):

	December 31, 2018				December 31, 2017			
	Gross Carrying Amount	Accumulated Amortization	Other	Net Carrying Amount	Gross Carrying Amount	Accumulated Amortization	Other	Net Carrying Amount
Finite-lived intangible assets:								
Developed technology	$ 152,431	$ (40,705)	$ 1,205	$ 112,931	$ 125,889	$ (19,317)	$ 1,847	$ 108,419
Trade names	45,275	(44,056)	170	1,389	45,275	(10,924)	261	34,612
Favorable contracts and leases, net	112,817	(16,409)	—	96,408	112,817	(8,639)	—	104,178
Other	35,559	(11,540)	719	24,738	34,099	(7,775)	1,137	27,461
Total finite-lived intangible assets	346,082	(112,710)	2,094	235,466	318,080	(46,655)	3,245	274,670
Indefinite-lived intangible assets:								
IPR&D	60,290	—	(13,264)	47,026	86,832	—	—	86,832
Total indefinite-lived intangible assets	60,290	—	(13,264)	47,026	86,832	—	—	86,832
Total intangible assets	$ 406,372	$ (112,710)	$ (11,170)	$ 282,492	$ 404,912	$ (46,655)	$ 3,245	$ 361,502

The in-process research and development (“IPR&D”), which we acquired from SolarCity, is accounted for as an indefinite-lived asset until the completion or abandonment of the associated research and development efforts. If the research and development efforts are successfully completed and commercial feasibility is reached, the IPR&D would be amortized over its then estimated useful life. If the research and development efforts are not completed or are abandoned, the IPR&D might be impaired. The fair value of the IPR&D was estimated using the replacement cost method under the cost approach, based on the historical acquisition costs and expenses of the technology adjusted for

estimated developer's profit, opportunity cost and obsolescence factor. During the year ended December 31, 2018, we concluded that a portion of the IPR&D was not commercially feasible, and consequently recognized an abandonment loss of $13.3 million in restructuring and other expenses in the consolidated statements of operations. Additionally, $26.5 million of IPR&D was put into production during the year ended December 31, 2018, and we expect to complete the remaining research and development efforts in the first half of 2019. The nature of the research and development efforts consists principally of planning, designing and testing the technology for viability in manufacturing solar cells and modules. If commercial feasibility is not achieved for the remaining IPR&D, we would likely look to other alternative technologies.

The costs associated with one of the trade names acquired by us has been fully amortized as of December 31, 2018 as we phased out the use of such trade name in our sales and marketing efforts.

Total future amortization expense for intangible assets was estimated as follows (in thousands):

	December 31, 2018
2019	$ 34,637
2020	