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

FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2023

OR

o **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.)**
1 Tesla Road **Austin, Texas**	**78725**
(Address of principal executive offices)	**(Zip Code)**

(512) 516-8177

(Registrant's telephone number, including area code)

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common stock	TSLA	The Nasdaq Global Select Market

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 x No o

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

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 x No o

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 x No o

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	x	Accelerated filer	o
Non-accelerated filer	o	Smaller reporting company	o
Emerging growth company	o		

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. o

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

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

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

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

The aggregate market value of voting stock held by non-affiliates of the registrant, as of June 30, 2023, the last day of the registrant's most recently completed second fiscal quarter, was $722.52 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, 2023). Shares of Common Stock held by each executive officer and director 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 January 22, 2024, there were 3,184,790,415 shares of the registrant's common stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Proxy Statement for the 2024 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, 2023.

TESLA, INC.

ANNUAL REPORT ON FORM 10-K FOR THE YEAR ENDED DECEMBER 31, 2023

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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 supply chain constraints, our strategy, competition, future operations and production capacity, 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 markets in which we operate, prospects and plans and objectives of management. The words “anticipates,” “believes,” “could,” “estimates,” “expects,” “intends,” “may,” “plans,” “projects,” “will,” “would” 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” of the Annual Report on Form 10-K for the fiscal year ended December 31, 2023 and that are otherwise described or updated from time to time in our other filings with the Securities and Exchange Commission (the “SEC”). The discussion of such risks is not an indication that any such risks have occurred at the time of this filing. We do not assume any obligation to update any forward-looking statements.

PART I

ITEM 1. BUSINESS

Overview

We design, develop, manufacture, sell and lease high-performance fully electric vehicles and energy generation and storage systems, and offer services related to our products. We generally sell our products directly to customers, and continue to grow our customer-facing infrastructure through a global network of vehicle showrooms and service centers, Mobile Service, body shops, Supercharger stations and Destination Chargers to accelerate the widespread adoption of our products. We emphasize performance, attractive styling and the safety of our users and workforce in the design and manufacture of our products and are continuing to develop full self-driving technology for improved safety. We also strive to lower the cost of ownership for our customers through continuous efforts to reduce manufacturing costs and by offering financial and other services tailored to our products.

Our mission is to accelerate the world’s transition to sustainable energy. We believe that this mission, along with our engineering expertise, vertically integrated business model and focus on user experience differentiate us from other companies.

Segment Information

We operate as two reportable segments: (i) automotive and (ii) energy generation and storage.

The automotive segment includes the design, development, manufacturing, sales and leasing of high-performance fully electric vehicles as well as sales of automotive regulatory credits. Additionally, the automotive segment also includes services and other, which includes sales of used vehicles, non-warranty after-sales vehicle services, body shop and parts, paid Supercharging, vehicle insurance revenue and retail merchandise. The energy generation and storage segment includes the design, manufacture, installation, sales and leasing of solar energy generation and energy storage products and related services and sales of solar energy systems incentives.

Our Products and Services

Automotive

We currently manufacture five different consumer vehicles – the Model 3, Y, S, X and Cybertruck. Model 3 is a four-door mid-size sedan that we designed for manufacturability with a base price for mass-market appeal. Model Y is a compact sport utility vehicle (“SUV”) built on the Model 3 platform with seating for up to seven adults. Model S is a four-door full-size sedan and Model X is a mid-size SUV with seating for up to seven adults. Model S and Model X feature the highest performance characteristics and longest ranges that we offer in a sedan and SUV, respectively. In November 2023, we entered the consumer pickup truck market with first deliveries of the Cybertruck, a full-size electric pickup truck with a stainless steel exterior that has the utility and strength of a truck while featuring the speed of a sports car.

In 2022, we also began early production and deliveries of a commercial electric vehicle, the Tesla Semi. We have planned electric vehicles to address additional vehicle markets, and to continue leveraging developments in our proprietary Full Self-Driving (“FSD”) Capability features, battery cell and other technologies.

Energy Generation and Storage

Energy Storage Products

Powerwall and Megapack are our lithium-ion battery energy storage products. Powerwall, which we sell directly to customers, as well as through channel partners, is designed to store energy at a home or small commercial facility. Megapack is an energy storage solution for commercial, industrial, utility and energy generation customers, multiple of which may be grouped together to form larger installations of gigawatt hours (“GWh”) or greater capacity.

We also continue to develop software capabilities for remotely controlling and dispatching our energy storage systems across a wide range of markets and applications, including through our real-time energy control and optimization platforms.

Management Opportunities, Challenges and Uncertainties and 2024 Outlook

Automotive—Production

The following is a summary of the status of production of each of our announced vehicle models in production and under development, as of the date of this Annual Report on Form 10-K:

Production Location	Vehicle Model(s)	Production Status
Fremont Factory	Model S / Model X	Active
	Model 3 / Model Y	Active
Gigafactory Shanghai	Model 3 / Model Y	Active
Gigafactory Berlin-Brandenburg	Model Y	Active
Gigafactory Texas	Model Y	Active
	Cybertruck	Active
Gigafactory Nevada	Tesla Semi	Pilot production
Various	Next Generation Platform	In development
TBD	Tesla Roadster	In development

We are focused on growing our manufacturing capacity, which includes capacity for manufacturing new vehicle models such as our Cybertruck and next generation platform, and ramping all of our production vehicles to their installed production capacities as well as increasing production rate and efficiency at our current factories. The next phase of production growth will depend on the continued ramp at our factories and the introduction of our next generation platform, as well as our ability to add to our available sources of battery cell supply by manufacturing our own cells that we are developing to have high-volume output, lower capital and production costs and longer range. Our goals are to improve vehicle performance, decrease production costs and increase affordability and customer awareness.

These plans are subject to uncertainties inherent in establishing and ramping manufacturing operations, which may be exacerbated by new product and manufacturing technologies we introduce, the number of concurrent international projects, any industry-wide component constraints, labor shortages and any future impact from events outside of our control. For example, during the third quarter of 2023, we experienced a sequential decline in production volumes due to pre-planned shutdowns for upgrades at various factories. Moreover, we have set ambitious technological targets with our plans for battery cells as well as for iterative manufacturing and design improvements for our vehicles with each new factory.

Automotive—Demand, Sales, Deliveries and Infrastructure

Our cost reduction efforts, cost innovation strategies, and additional localized procurement and manufacturing are key to our vehicles' affordability and have allowed us to competitively price our vehicles. We will also continue to generate demand and brand awareness by improving our vehicles' performance and functionality, including through products based on artificial intelligence such as Autopilot, FSD Capability, and other software features and delivering new vehicles, such as our Cybertruck. Moreover, we expect to continue to benefit from ongoing electrification of the automotive sector and increasing environmental regulations and initiatives.

However, we operate in a cyclical industry that is sensitive to political and regulatory uncertainty, including with respect to trade and the environment, all of which can be compounded by inflationary pressures, rising energy prices, interest rate fluctuations and the liquidity of enterprise customers. For example, inflationary pressures have increased across the markets in which we operate. In an effort to curb this trend, central banks in developed countries raised interest rates rapidly and substantially, impacting the affordability of vehicle lease and finance arrangements. Further, 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. Moreover, as additional competitors enter the marketplace and help bring the world closer to sustainable transportation, we will have to adjust and continue to execute well to maintain our momentum. Additionally, our suppliers' liquidity and allocation plans may be affected by current challenges in the North American automotive industry, which could reduce our access to components or result in unfavorable changes to cost. These macroeconomic and industry trends have had, and will likely continue to have, an impact on the pricing of, and order rate for our vehicles, and in turn our operating margin. Changes in government and economic incentives in relation to electric vehicles may also impact our sales. We will continue to adjust accordingly to such developments, and we believe our ongoing cost reduction, including improved production innovation and efficiency at our newest factories and lower logistics costs, and focus on operating leverage will continue to benefit us in relation to our competitors, while our new products will help enable future growth.

As our production increases, we must work constantly to similarly increase vehicle delivery capability so that it does not become a bottleneck on our total deliveries. We are also committed to reducing the percentage of vehicles delivered in the third month of each quarter, which will help to reduce the cost per vehicle. As we expand our manufacturing operations globally, we will also have to continue to increase and staff our delivery, servicing and charging infrastructure accordingly, maintain our vehicle reliability and optimize our Supercharger locations to ensure cost effectiveness and customer satisfaction. In particular, as other automotive manufacturers have announced their adoption of the North American Charging Standard ("NACS") and agreements with us to utilize our Superchargers, we must correspondingly expand our network in order to ensure adequate availability to meet customer demands. We also remain focused on continued enhancements of the capability and efficiency of our servicing operations.

Energy Generation and Storage Demand, Production and Deployment

The long-term success of this business is dependent upon increasing margins through greater volumes. We continue to increase the production of our energy storage products to meet high levels of demand, including the construction of a new Megafactory in Shanghai and the ongoing ramp at our Megafactory in Lathrop, California. For Megapack, energy storage deployments can vary meaningfully quarter to quarter depending on the timing of specific project milestones. We remain committed to growing our retrofit solar energy business by offering a low-cost and simplified online ordering experience. In addition, we continue to seek to improve our installation capabilities and price efficiencies for Solar Roof. As these product lines grow, we will have to maintain adequate battery cell supply for our energy storage products and ensure the availability of qualified personnel, particularly skilled electricians, to support the ramp of Solar Roof.

Cash Flow and Capital Expenditure Trends

Our capital expenditures are typically difficult to project beyond the short-term given the number and breadth of our core projects at any given time, and may further be impacted by uncertainties in future global market conditions. We are simultaneously ramping new products, building or ramping manufacturing facilities on three continents, piloting the development and manufacture of new battery cell technologies, expanding our Supercharger network and investing in autonomy and other artificial intelligence enabled training and products, and the pace of our capital spend may vary depending on overall priority among projects, the pace at which we meet milestones, production adjustments to and among our various products, increased capital efficiencies and the addition of new projects. Owing and subject to the foregoing as well as the pipeline of announced projects under development, all other continuing infrastructure growth and varying levels of inflation, we currently expect our capital expenditures to exceed $10.00 billion in 2024 and be between $8.00 to $10.00 billion in each of the following two fiscal years.

Our business has been consistently generating cash flow from operations in excess of our level of capital spend, and with better working capital management resulting in shorter days sales outstanding than days payable outstanding, our sales growth is also generally facilitating positive cash generation. We have and will continue to utilize such cash flows, among other things, to do more vertical integration, expand our product roadmap and provide financing options to our customers. At the same time, we are likely to see heightened levels of capital expenditures during certain periods depending on the specific pace of our capital-intensive projects and other potential variables such as rising material prices and increases in supply chain and labor expenses resulting from changes in global trade conditions and labor availability. Overall, we expect our ability to be self-funding to continue as long as macroeconomic factors support current trends in our sales.

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 may be affected.

The estimates used for, but not limited to, determining significant economic incentive for resale value guarantee arrangements, sales return reserves, the collectability of accounts and financing receivables, inventory valuation, warranties, fair value of long-lived assets, goodwill, fair value of financial instruments, fair value and residual value of operating lease vehicles and solar energy systems subject to leases could be impacted. We have assessed the impact and are not aware of any specific events or circumstances that required an update to our estimates and assumptions or materially affected the carrying value of our assets or liabilities as of the date of issuance of this Annual Report on Form 10-K. These estimates may change as new events occur and additional information is obtained. Actual results could differ materially from these estimates under different assumptions or conditions.

Revenue Recognition

Automotive Sales

Automotive sales revenue includes revenues related to cash and financing deliveries of new vehicles, and specific other features and services that meet the definition of a performance obligation under Accounting Standards Codification (“ASC”) 606, *Revenue from Contracts with Customers* (“ASC 606”), including access to our FSD Capability features and their ongoing maintenance, internet connectivity, free Supercharging programs 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, except sales we finance for which payments are collected over the contractual loan term. We also recognize a sales return reserve based on historical experience plus consideration for expected future market values, when we offer resale value guarantees or similar buyback terms. Other features and services such as access to our internet connectivity, unlimited free Supercharging 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. Other limited free Supercharging incentives are recognized based on actual usage or expiration, whichever is earlier. We recognize revenue related to these other features and services over the performance period, which is generally the expected ownership life of the vehicle. Revenue related to FSD Capability features is recognized when functionality is delivered to the customer and their ongoing maintenance is recognized over time. 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.

Inventory Valuation

Inventories are stated at the lower of cost or net realizable value. Cost is computed using standard cost for vehicles and energy products, which approximates actual cost on a first-in, first-out basis. We record inventory write-downs for excess or obsolete inventories based upon assumptions about 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 write-downs 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 and a warranty on the installation and components of the energy generation and storage systems we sell for periods typically between 10 to 25 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 if 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 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 operating 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 sheets. For liabilities that we are entitled to receive indemnification from our suppliers, we record receivables for the contractually obligated amounts on the consolidated balance sheets as a component of Prepaid expenses and other current assets for the current portion and as Other non-current assets for the long-term portion. Warranty expense is recorded as a component of Cost of revenues in the consolidated statements of operations. Due to the magnitude of our automotive business, our accrued warranty balance is primarily related to our automotive segment.

Stock-Based Compensation

We use the fair value method of accounting for our stock options and restricted stock units ("RSUs") granted to employees and for 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 and/or performance conditions 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.

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.

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 income 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 that are not more likely than not to be realized. We monitor the realizability of our deferred tax assets taking into account all relevant factors at each reporting period. In completing our assessment of realizability of our deferred tax assets, we consider our history of income (loss) measured at pre-tax income (loss) adjusted for permanent book-tax differences on a jurisdictional basis, volatility in actual earnings, excess tax benefits related to stock-based compensation in recent prior years, and impacts of the timing of reversal of existing temporary differences. We also rely on our assessment of the Company's projected future results of business operations, including uncertainty in future operating results relative to historical results, volatility in the market price of our common stock and its performance over time, variable macroeconomic conditions impacting our ability to forecast future taxable income, and changes in business that may affect the existence and magnitude of future taxable income. Our valuation allowance assessment is based on our best estimate of future results considering all available information.

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 or taxes payable 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 some of 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.

Results of Operations

Revenues

	Year Ended December 31,			2023 vs. 2022 Change		2022 vs. 2021 Change	
(Dollars in millions)	2023	2022	2021	$	%	$	%
Automotive sales	$ 78,509	$ 67,210	$ 44,125	$ 11,299	17 %	$ 23,085	52 %
Automotive regulatory credits	1,790	1,776	1,465	14	1 %	311	21 %
Automotive leasing	2,120	2,476	1,642	(356)	(14)%	834	51 %
Total automotive revenues	82,419	71,462	47,232	10,957	15 %	24,230	51 %
Services and other	8,319	6,091	3,802	2,228	37 %	2,289	60 %
Total automotive & services and other segment revenue	90,738	77,553	51,034	13,185	17 %	26,519	52 %
Energy generation and storage segment revenue	6,035	3,909	2,789	2,126	54 %	1,120	40 %
Total revenues	$ 96,773	$ 81,462	$ 53,823	$ 15,311	19 %	$ 27,639	51 %

Automotive & Services and Other Segment

Automotive sales revenue includes revenues related to cash and financing deliveries of new Model S, Model X, Semi, Model 3, Model Y, and Cybertruck vehicles, including access to our FSD Capability features and their ongoing maintenance, internet connectivity, free Supercharging programs and over-the-air software updates. These deliveries are vehicles that are not subject to lease accounting.

Automotive regulatory credits includes sales of regulatory credits to other automotive manufacturers. Our revenue from automotive regulatory credits is directly related to our new vehicle production, sales and pricing negotiated with our customers. We monetize them proactively as new vehicles are sold based on standing arrangements with buyers of such credits, typically as close as possible to the production and delivery of the vehicle or changes in regulation impacting the credits.

Automotive leasing revenue includes the amortization of revenue for vehicles under direct operating lease agreements. Additionally, automotive leasing revenue includes direct sales-type leasing programs where we recognize all revenue associated with the sales-type lease upon delivery to the customer.

Services and other revenue consists of sales of used vehicles, non-warranty after-sales vehicle services, body shop and parts, paid Supercharging, vehicle insurance revenue and retail merchandise.

2023 compared to 2022

Automotive sales revenue increased $11.30 billion, or 17%, in the year ended December 31, 2023 as compared to the year ended December 31, 2022, primarily due to an increase of 473,382 combined Model 3 and Model Y cash deliveries from production ramping of Model Y globally. The increase was partially offset by a lower average selling price on our vehicles driven by overall price reductions year over year, sales mix, and a negative impact from the United States dollar strengthening against other foreign currencies in the year ended December 31, 2023 compared to the prior year.

Automotive regulatory credits revenue increased $14 million, or 1%, in the year ended December 31, 2023 as compared to the year ended December 31, 2022.

Automotive leasing revenue decreased $356 million, or 14%, in the year ended December 31, 2023 as compared to the year ended December 31, 2022. The decrease was primarily due to a decrease in direct sales-type leasing revenue driven by lower deliveries year over year, partially offset by an increase from our growing direct operating lease portfolio.

Services and other revenue increased $2.23 billion, or 37%, in the year ended December 31, 2023 as compared to the year ended December 31, 2022. The increase was primarily due to higher used vehicle revenue driven by increases in volume, body shop and part sales revenue, non-warranty maintenance services revenue, paid Supercharging revenue and insurance services revenue, all of which are primarily attributable to our growing fleet. The increases were partially offset by a decrease in the average selling price of used vehicles.

Energy Generation and Storage Segment

Energy generation and storage revenue includes sales and leasing of solar energy generation and energy storage products, financing of solar energy generation products, services related to such products and sales of solar energy systems incentives.

2023 compared to 2022

Energy generation and storage revenue increased $2.13 billion, or 54%, in the year ended December 31, 2023 as compared to the year ended December 31, 2022. The increase was primarily due to an increase in deployments of Megapack.

Cost of Revenues and Gross Margin

	Year Ended December 31,			2023 vs. 2022 Change		2022 vs. 2021 Change	
(Dollars in millions)	2023	2022	2021	$	%	$	%
Cost of revenues							
Automotive sales	$ 65,121	$ 49,599	$ 32,415	$ 15,522	31 %	$ 17,184	53 %
Automotive leasing	1,268	1,509	978	(241)	(16)%	531	54 %
Total automotive cost of revenues	66,389	51,108	33,393	15,281	30 %	17,715	53 %
Services and other	7,830	5,880	3,906	1,950	33 %	1,974	51 %
Total automotive & services and other segment cost of revenues	74,219	56,988	37,299	17,231	30 %	19,689	53 %
Energy generation and storage segment	4,894	3,621	2,918	1,273	35 %	703	24 %
Total cost of revenues	$ 79,113	$ 60,609	$ 40,217	$ 18,504	31 %	$ 20,392	51 %
Gross profit total automotive	$ 16,030	$ 20,354	$ 13,839				
Gross margin total automotive	19.4 %	28.5 %	29.3 %				
Gross profit total automotive & services and other segment	$ 16,519	$ 20,565	$ 13,735				
Gross margin total automotive & services and other segment	18.2 %	26.5 %	26.9 %				
Gross profit energy generation and storage segment	$ 1,141	$ 288	$ (129)				
Gross margin energy generation and storage segment	18.9 %	7.4 %	(4.6)%				
Total gross profit	$ 17,660	$ 20,853	$ 13,606				
Total gross margin	18.2 %	25.6 %	25.3 %				

Automotive & Services and Other Segment

Cost of automotive sales revenue includes direct and indirect materials, labor costs, manufacturing overhead, including depreciation costs of tooling and machinery, shipping and logistic costs, vehicle connectivity costs, FSD ongoing maintenance 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. Additionally, cost of automotive sales revenue benefits from manufacturing credits earned.

Cost of automotive leasing revenue includes the depreciation of operating lease vehicles, cost of goods sold associated with direct sales-type leases and warranty expense related to leased vehicles.

Costs of services and other revenue includes cost of used vehicles including refurbishment costs, costs associated with providing non-warranty after-sales services, costs associated with our body shops and part sales, costs of paid Supercharging, costs to provide vehicle insurance and costs for retail merchandise.

2023 compared to 2022

Cost of automotive sales revenue increased $15.52 billion, or 31%, in the year ended December 31, 2023 as compared to the year ended December 31, 2022. Cost of automotive sales revenue increased in line with the change in deliveries year over year, as discussed above. The increase was partially offset by a decrease in the average combined cost per unit of our vehicles primarily due to sales mix, lower inbound freight, a decrease in material costs and lower manufacturing costs from better fixed cost absorption. Our costs of revenue were also positively impacted by the United States dollar strengthening against our foreign currencies as compared to the prior periods and by the IRA manufacturing credits earned during the current year.

Cost of automotive leasing revenue decreased $241 million, or 16%, in the year ended December 31, 2023 as compared to the year ended December 31, 2022. The decrease was primarily due to a decrease in direct sales-type leasing cost of revenue driven by lower deliveries year over year.

Cost of services and other revenue increased $1.95 billion, or 33%, in the year ended December 31, 2023 as compared to the year ended December 31, 2022. The increase was generally in line with the changes in services and other revenue as discussed above.

Gross margin for total automotive decreased from 28.5% to 19.4% in the year ended December 31, 2023 as compared to the year ended December 31, 2022. The decrease was primarily due to a lower average selling price on our vehicles partially offset by the favorable change in our average combined cost per unit of our vehicles and IRA manufacturing credits earned as discussed above.

Gross margin for total automotive & services and other segment decreased from 26.5% to 18.2% in the year ended December 31, 2023 as compared to the year ended December 31, 2022, primarily due to the automotive gross margin decrease discussed above.

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. Cost of energy generation and storage revenue also includes 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. Additionally, cost of energy generation and storage revenue benefits from manufacturing credits earned. In agreements for solar energy systems and PPAs where we are the lessor, 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.

2023 compared to 2022

Cost of energy generation and storage revenue increased $1.27 billion, or 35%, in the year ended December 31, 2023 as compared to the year ended December 31, 2022, in line with the increase in Megapack deployments year over year, as discussed above. This increase was partially offset by an improvement in production ramping that drove down the average cost per MWh of Megapack as well as IRA manufacturing credits earned during the current year.

Gross margin for energy generation and storage increased from 7.4% to 18.9% in the year ended December 31, 2023 as compared to the year ended December 31, 2022. The increase was driven by an improvement in our Megapack gross margin from lower average cost per MWh and a higher proportion of Megapack, which operated at a higher gross margin, within the segment as compared to the prior year periods. Additionally, there was a margin benefit from IRA manufacturing credits earned.

Research and Development Expense

	Year Ended December 31,			2023 vs. 2022 Change		2022 vs. 2021 Change	
(Dollars in millions)	2023	2022	2021	$	%	$	%
Research and development	$ 3,969	$ 3,075	$ 2,593	$ 894	29 %	$ 482	19 %
As a percentage of revenues	4 %	4 %	5 %				

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 $894 million, or 29%, in the year ended December 31, 2023 as compared to the year ended December 31, 2022. The overall increase was primarily driven by additional costs in the current year related to the pre-production phase for Cybertruck, AI and other programs.

R&D expenses as a percentage of revenue stayed consistent at 4% in the year ended December 31, 2023 as compared to the year ended December 31, 2022. Our R&D expenses have increased proportionately with total revenues as we continue to expand our product roadmap and technologies.

Selling, General and Administrative Expense

	Year Ended December 31,			2023 vs. 2022 Change		2022 vs. 2021 Change	
(Dollars in millions)	2023	2022	2021	$	%	$	%
Selling, general and administrative	$ 4,800	$ 3,946	$ 4,517	$ 854	22 %	$ (571)	(13)%
As a percentage of revenues	5 %	5 %	8 %				

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 $854 million, or 22%, in the year ended December 31, 2023 as compared to the year ended December 31, 2022. This was driven by a $447 million increase in employee and labor costs primarily from increased headcount, including professional services and a $363 million increase in facilities related expenses.

Restructuring and Other

	Year Ended December 31,			2023 vs. 2022 Change		2022 vs. 2021 Change	
(Dollars in millions)	2023	2022	2021	$	%	$	%
Restructuring and other	$ —	$ 176	$ (27)	$ (176)	(100)%	$ 203	Not meaningful

During the year ended December 31, 2022, we recorded an impairment loss of $204 million as well as realized gains of $64 million in connection with converting our holdings of digital assets into fiat currency. We also recorded other expenses of $36 million during the second quarter of the year ended December 31, 2022, related to employee terminations.

Interest Income

	Year Ended December 31,			2023 vs. 2022 Change		2022 vs. 2021 Change	
(Dollars in millions)	2023	2022	2021	$	%	$	%
Interest income	$ 1,066	$ 297	$ 56	$ 769	259 %	$ 241	430 %

Interest income increased $769 million, or 259%, in the year ended December 31, 2023 as compared to the year ended December 31, 2022. This increase was primarily due to higher interest earned on our cash and cash equivalents and short-term investments in the year ended December 31, 2023 as compared to the prior year due to rising interest rates and our increasing portfolio balance.

Other Income (Expense), Net

	Year Ended December 31,			2023 vs. 2022 Change		2022 vs. 2021 Change	
(Dollars in millions)	2023	2022	2021	$	%	$	%
Other income (expense), net	$ 172	$ (43)	$ 135	$ 215	Not meaningful	$ (178)	Not meaningful

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

Other income, net, changed favorably by $215 million in the year ended December 31, 2023 as compared to the year ended December 31, 2022. The favorable change was primarily due to fluctuations in foreign currency exchange rates on our intercompany balances.

(Benefit from) Provision for Income Taxes

	Year Ended December 31,			2023 vs. 2022 Change		2022 vs. 2021 Change	
(Dollars in millions)	2023	2022	2021	$	%	$	%
(Benefit from) provision for income taxes	$ (5,001)	$ 1,132	$ 699	$ (6,133)	Not meaningful	$ 433	62 %
Effective tax rate	(50)%	8 %	11 %				

We monitor the realizability of our deferred tax assets taking into account all relevant factors at each reporting period. As of December 31, 2023, based on the relevant weight of positive and negative evidence, including the amount of our taxable income in recent years which is objective and verifiable, and consideration of our expected future taxable earnings, we concluded that it is more likely than not that our U.S. federal and certain state deferred tax assets are realizable. As such, we released $6.54 billion of our valuation allowance associated with the U.S. federal and state deferred tax assets, with the exception of our California deferred tax assets. Approximately $5.93 billion of the total valuation allowance release was related to deferred tax assets to be realized in the future years and the remainder benefited us during the year ended December 31, 2023. We continue to maintain a full valuation allowance against our California deferred tax assets as of December 31, 2023, because we concluded they are not more likely than not to be realized as we expect our California deferred tax assets generation in future years to exceed our ability to use these deferred tax assets.

Our (benefit from) provision for income taxes changed by $6.13 billion in the year ended December 31, 2023 as compared to the year ended December 31, 2022, primarily due to the release of $6.54 billion of our valuation allowance associated with the U.S. federal and certain state deferred tax assets.

Our effective tax rate changed from an expense of 8% to a benefit of 50% in the year ended December 31, 2023 as compared to the year ended December 31, 2022, primarily due to the release of the valuation allowance regarding our U.S. federal and certain state deferred tax assets.

See Note 14, *Income Taxes*, to the consolidated financial statements included elsewhere in this Annual Report on Form 10-K for further details.

Liquidity and Capital Resources

We expect to continue to generate net positive operating cash flow as we have done in the last five fiscal years. The cash we generate from our core operations enables us to fund ongoing operations and production, our research and development projects for new products and technologies including our proprietary battery cells, additional manufacturing ramps at existing manufacturing facilities, the construction of future factories, and the continued expansion of our retail and service locations, body shops, Mobile Service fleet, Supercharger, including to support NACS, energy product installation capabilities and autonomy and other artificial intelligence enabled products.

In addition, because a large portion of our future expenditures will be to fund our growth, we expect that if needed we will be able to adjust our capital and operating expenditures by operating segment. For example, if our near-term manufacturing operations decrease in scale or ramp more slowly than expected, including due to global economic or business conditions, we may choose to correspondingly slow the pace of our capital expenditures. Finally, we continually evaluate our cash needs and may decide it is best to raise additional capital or seek alternative financing sources to fund the rapid growth of our business, including through drawdowns on existing or new debt facilities or financing funds. Conversely, we may also from time to time determine that it is in our best interests to voluntarily repay certain indebtedness early.

Accordingly, we believe that our current sources of funds will provide us with adequate liquidity during the 12-month period following December 31, 2023, as well as in the long-term.

See the sections below for more details regarding the material requirements for cash in our business and our sources of liquidity to meet such needs.

Material Cash Requirements

From time to time in the ordinary course of business, we enter into agreements with vendors for the purchase of components and raw materials to be used in the manufacture of our products. However, due to contractual terms, variability in the precise growth curves of our development and production ramps, and opportunities to renegotiate pricing, we generally do not have binding and enforceable purchase orders under such contracts beyond the short-term, and the timing and magnitude of purchase orders beyond such period is difficult to accurately project.

As discussed in and subject to the considerations referenced in Part II, Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations—Management Opportunities, Challenges and Uncertainties and 2023 Outlook—Cash Flow and Capital Expenditure Trends in this Annual Report on Form 10-K, we currently expect our capital expenditures to support our projects globally to exceed $10.00 billion in 2024 and be between $8.00 to $10.00 billion in each of the following two fiscal years. In connection with our operations at Gigafactory New York, we have an agreement to spend or incur $5.00 billion in combined capital, operational expenses, costs of goods sold and other costs in the State of New York through December 31, 2029 (pursuant to a deferral of our required timelines to meet such obligations that was granted in April 2021, and which was memorialized in an amendment to our agreement with the SUNY Foundation in August 2021). For details regarding these obligations, refer to Note 15, *Commitments and Contingencies*, to the consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

As of December 31, 2023, we and our subsidiaries had outstanding $4.68 billion in aggregate principal amount of indebtedness, of which $1.98 billion is scheduled to become due in the succeeding 12 months. As of December 31, 2023, our total minimum lease payments was $5.96 billion, of which $1.31 billion is due in the succeeding 12 months. For details regarding our indebtedness and lease obligations, refer to Note 11, *Debt*, and Note 12, *Leases*, to the consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

Sources and Conditions of Liquidity

Our sources to fund our material cash requirements are predominantly from our deliveries and servicing of new and used vehicles, sales and installations of our energy storage products and solar energy systems, proceeds from debt facilities and proceeds from equity offerings, when applicable.

As of December 31, 2023, we had $16.40 billion and $12.70 billion of cash and cash equivalents and short-term investments, respectively. Balances held in foreign currencies had a U.S. dollar equivalent of $4.43 billion and consisted primarily of Chinese yuan and euros. We had $5.03 billion of unused committed credit amounts as of December 31, 2023. For details regarding our indebtedness, refer to Note 11, *Debt*, to the consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

We continue adapting our strategy to meet our liquidity and risk objectives, such as investing in U.S. government securities and other investments, to do more vertical integration, expand our product roadmap and provide financing options to our customers.

Summary of Cash Flows

(Dollars in millions)	Year Ended December 31, 2023	2022	2021
Net cash provided by operating activities	$ 13,256	$ 14,724	$ 11,497
Net cash used in investing activities	$ (15,584)	$ (11,973)	$ (7,868)
Net cash provided by (used in) financing activities	$ 2,589	$ (3,527)	$ (5,203)

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. Our operating cash inflows include cash from vehicle sales and related servicing, customer lease and financing payments, customer deposits, cash from sales of regulatory credits and energy generation and storage products, and interest income on our cash and investments portfolio. These cash inflows are offset by our payments to suppliers for production materials and parts used in our manufacturing process, operating expenses, operating lease payments and interest payments on our financings.

Net cash provided by operating activities decreased by $1.47 billion to $13.26 billion during the year ended December 31, 2023 from $14.72 billion during the year ended December 31, 2022. This decrease was primarily due to the decrease in net income excluding non-cash expenses, gains and losses of $2.93 billion, partially offset by favorable changes in net operating assets and liabilities of $1.46 billion.

Cash Flows from Investing Activities

Cash flows from investing activities and their variability across each period related primarily to capital expenditures, which were $8.90 billion for the year ended December 31, 2023 and $7.16 billion for the year ended December 31, 2022, mainly for global factory expansion and machinery and equipment as we expand our product roadmap. We also purchased $6.62 billion and $5.81 billion of investments, net of proceeds from maturities and sales, for the year ended December 31, 2023 and 2022, respectively. Additionally, proceeds from sales of digital assets was $936 million in the year ended December 31, 2022.

Cash Flows from Financing Activities

Net cash from financing activities changed by $6.12 billion to $2.59 billion net cash provided by financing activities during the year ended December 31, 2023 from $3.53 billion net cash used in financing activities during the year ended December 31, 2022. The change was primarily due to a $3.93 billion increase in proceeds from issuances of debt and a $2.01 billion decrease in repayments of debt. See Note 11, *Debt*, to the consolidated financial statements included elsewhere in this Annual Report on Form 10-K for further details regarding our debt obligations.

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.