



Impact Report

20
23

Contents

01	
<hr/>	
Governance	4
<hr/>	
1.1	5
Our Mission	
<hr/>	
1.2	6
Overview	
<hr/>	
1.3	8
Materiality and TCFD Alignment	
<hr/>	
1.4	13
Privacy and Security	

02	
<hr/>	
Environment	18
<hr/>	
2.1	19
Displacing Fossil Fuels	
<hr/>	
2.2	27
Carbon Impact of Our Products	
<hr/>	
2.3	36
Carbon Impact of Our Operations	
<hr/>	
2.4	47
Water, Circularity and Biodiversity	

03	
<hr/>	
Product & Safety	52
<hr/>	
3.1	53
Making EVs Affordable	
<hr/>	
3.2	57
Freedom to Travel	
<hr/>	
3.3	61
Maximizing Safety	
<hr/>	
3.4	71
Building the Grid of the Future	

04	
<hr/>	
People & Community	77
<hr/>	
4.1	78
Preparing the Workforce for a Sustainable Energy Future	
<hr/>	
4.2	85
Centering Safety and Engagement	
<hr/>	
4.3	91
Developing Our Leaders Internally	
<hr/>	
4.4	101
Social Impact	

Contents

05

Supply Chain	103
5.1 Supply Chain Decarbonization	107
5.2 Recycling	110
5.3 Responsible Sourcing of Battery Materials	113
5.4 Responsible Sourcing of Other Priority Materials	127
5.5 Tools	131

06

Appendix	141
6.1 TCFD	142
6.2 SASB	143
6.3 United Nations SDG Alignment	144
6.4 Key Metrics	146
6.5 Management Assertion	152

Governance

Sustainability is Core to Our Mission

Our Mission	05
Overview	06
Assessments	08
Privacy and Security	13

Our mission is to accelerate the world's transition to sustainable energy

Since Tesla's inception, our goals have centered on the opportunities presented by the sustainable energy transition. We have developed a clean energy ecosystem that addresses the energy generation, energy storage and transportation sectors. Through our zero direct emission electric vehicles and energy products, we are accelerating the world's transition to sustainable energy.

Governance Overview

Management Involvement

At Tesla, sustainability is everyone's job. Our Sustainability and Impact team, in collaboration with leaders from across the company, ensures the collection, preparation and analysis of data for content within this report.

Material issues and themes related to sustainability are presented to Tesla's Board of Directors (BoD) for review.

For more information on Tesla's corporate governance, refer to our [2024 Proxy Statement](#).

Board of Directors Overview

The BoD serves as a prudent fiduciary for shareholders and oversees Tesla's mission, purpose and strategy, as well as the effectiveness of our impact priorities, initiatives and programs. With those responsibilities in mind, the Board sets the highest standards for ethical behavior, corporate citizenship and corporate governance.

The BoD oversees risks related to environmental, social and governance ("ESG") issues, both at the full-board and committee levels. In particular, our Audit Committee oversees ESG risks as part of overall Enterprise Risk Management, including, among others, risks relating to climate, data privacy, cybersecurity, human rights and supply chain issues.

The Audit Committee also oversees our Impact Report and, as deemed appropriate, other ESG-related disclosures.

Our Compensation Committee oversees human capital management, employee engagement and relations and our compensation philosophy and programs designed to align compensation to the performance of our company and success of our mission to accelerate the world’s transition to sustainable energy.

Our Nominating and Corporate Governance Committee oversees our governance framework and practices, board composition and diversity and engagement on ESG issues with shareholders.

Our BoD continuously evaluates its composition, seeking to ensure the right mix of skills, experience, background and diversity to ensure the exceptional leadership necessary to fulfill our mission. We periodically add new, highly qualified independent directors to the BoD, such as Larry Ellison and Kathleen Wilson-Thompson in 2018, Hiromichi Mizuno in 2020, Joe Gebbia in 2022 and JB Straubel in 2023.

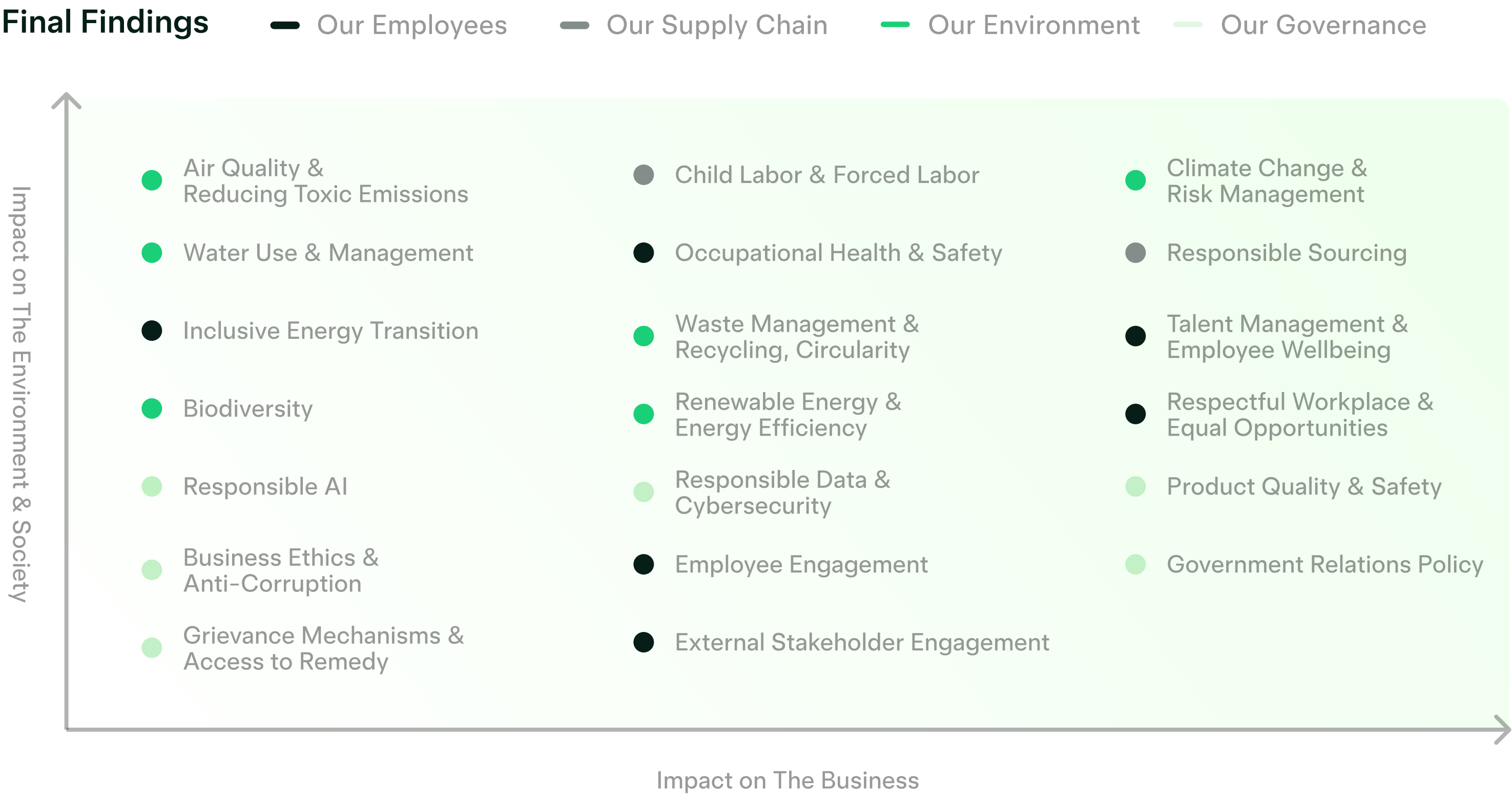
Sustainability Assessment

In 2023, we conducted a sustainability assessment to determine areas material to the business and salient to society and the environment. This assessment resulted in the identification of 20 focus areas listed in the chart on this page.

We started by surveying key global stakeholders, asking them to quantify the impact of certain topics on Tesla. Where appropriate, this was followed up with in-depth interviews with participants to contextualize quantitative scores.

Throughout the process, we partnered with a third-party expert. We will continue to evaluate the saliency of these risks and opportunities periodically to inform our overall strategy.

Note: the following focus areas are ranked relative to each other and not relative to overall importance. We also recognize this as a snapshot in time. As we continue to grow and the world changes, the degree of impact could naturally shift.



TCFD Alignment

We have been aligning this report with Task Force on Climate-Related Financial Disclosures (TCFD) since 2022.

While the focus of this report is to communicate the substantial positive impact Tesla is having on the world, we understand the importance of discussing both the opportunities and risks presented by a changing climate.

Our dedicated governance strategy allows Tesla to assess, manage and act on its own climate-related risks. This strategy is based on recommendations from the TCFD.

Managing Climate Risk

The Sustainability and Impact team works with executives from across Tesla to make decisions affecting the business with consideration to our climate change strategy. The Vice President of Environmental, Health, Safety and Security (EHS&S) leads these interactions and is responsible for our GHG emissions strategy, its implementation and TCFD alignment.

The Sustainability and Impact team at Tesla reports directly to the VP of EHS&S and meets regularly with stakeholders from Engineering and Design, Finance, Investor Relations, Legal, Policy, Supply Chain, among others to present megatrends and climate change updates. The VP of EHS&S reports events directly to the BoD.

Tesla conducts an annual Enterprise Risk Assessment (ERA) that integrates ESG-related risks by engaging in interviews and surveys with members of management across the organization, including key stakeholders in sustainability. Through this exercise, climate-related risks would be flagged to the relevant leadership team for management.

Beginning with Gigafactory Berlin-Brandenburg and Gigafactory Texas in 2021, we initiated site-specific reviews to identify physical climate-related risks that were then addressed during the design process of those factories. In 2022, this was followed by a systematic assessment of our entire manufacturing portfolio and any new locations.

Today, we continue to ensure that our current and future sites are prepared for the potential physical impacts of climate change by integrating assessments into considerations for site design and future expansion plans.

Using the results from these analyses, Tesla is actively working to harden our current and planned manufacturing portfolio against medium and long-term climate impacts. Over time, we will begin to evaluate other assets such as our Sales, Service and Delivery network as well as our charging infrastructure and other relevant assets.

As regulations around GHG emissions management evolve, we may need to make further capital investments that are different from or accelerated relative to existing plans, which may impact profitability. Policy changes may impact certain practices or infrastructure, potentially reducing installed capacity because the technology used—such as with die casting or the paint shop—cannot be fully decarbonized.

Physical Climate Risk Assessment

Tesla performs physical climate risk assessments for our manufacturing and support locations, including for any new manufacturing sites.

We assessed these sites using the following scenarios, which incorporate the science from the latest IPCC report: Business as usual, Emissions peak in 2040 and Paris-aligned—a combined approach using the latest Shared Socioeconomic Pathways (SSPs) and the Representative Concentration Pathways (RCPs).

This includes physical risks related to combined physical risk, flooding, wind risk, heat stress, wildfire, precipitation risk and drought. We assess these hazards against the three scenarios across short- (2025), medium- (2030) and long-term (2050) time horizons.

Given the low likelihood of reaching a Paris-aligned scenario, we report results on business as usual and emissions peaking in 2040.

In the short term, drought poses the biggest risk to our manufacturing portfolio and, in the long term, heat stress will become the more severe climate hazard.

Human Rights Are Core to Our Mission

The ethical treatment of all people and regard for human rights is core to our mission of accelerating a sustainable future. Our Global Human Rights Policy is the formalization of our commitment to uphold, respect and embed human rights and the values they represent throughout our business.

We endorse and base our definition of human rights on the United Nation's Universal Declaration for Human Rights (UDHR). The UDHR focuses on dignity, respect and equality, without discrimination, for all people. We also utilize the United Nation’s Guiding Principles on Business and Human Rights (UNGPs) and the Organization for Economic Cooperation and Development (OECD) Guidelines for Multinational Enterprises.

We are committed to upholding and respecting all internationally recognized human rights throughout our direct operations and supply chain—including with respect to our employees, customers, shareholders, suppliers and the communities in which we live and operate. Tesla’s Global Human Rights Policy outlines the company’s salient human rights issues.

We seek to avoid causing or contributing to actual or potentially adverse human rights impacts, and we expect our suppliers to support and promote these values in their own operations and those of their suppliers.

To learn more about our efforts in our supply chain, see pages 113–131.

Assessing and addressing human rights risks is an ongoing effort that involves engaging with and incorporating input from external stakeholders, including those impacted by our operations and our supply chain, as well as reviewing and updating our policies and procedures where necessary.

We seek to remedy adverse impacts, track and measure our progress and report our findings in our disclosures where appropriate.

Cybersecurity and Data Privacy

We build products with privacy and security at their core

Our privacy-first policies ensure personal data is in customers' hands, letting them decide what information they want to share and when. We believe that responsible data management and transparency is a prerequisite for continuous innovation. Read more about our company-wide approach in our [Privacy Overview](#).

Data privacy is a shared responsibility that every employee and Board member is expected to uphold. Tesla has a large and diverse team of privacy and security professionals across our legal, engineering and product organizations who are dedicated to protecting customer data. Additionally, the Audit Committee of the Tesla BoD is regularly briefed on incidents, emerging trends, controls and corrective actions taken by Tesla to ensure we are living up to our obligations and Privacy Principles.

Our Privacy Principles



We build privacy into our products from start to finish

We ensure privacy across all our products and services, from inception to roll out and beyond.



We always give customers choices about their data

We put individuals in control by giving them clear and transparent ways to access, review, manage and delete their data.



We maintain trust through transparency

We are clear about the personal data we collect and how we use or share it.



We safeguard personal data

We implement rigorous controls and standards designed to protect the security, confidentiality and integrity of Tesla’s data environment.

Privacy From Day One

Tesla's Privacy Principles and commitments are illustrated throughout all our products. For Tesla vehicles, customers' personal data is protected from the moment they take delivery, ensuring that by default the vehicle data generated when driving is not associated with their account or vehicle identification number. We put customers in the driver's seat when it comes to data sharing by providing a dedicated in-vehicle menu to adjust preferences at any time. Additionally, energy products are designed to protect customer privacy. We aim to collect as little personal data as is required to provide an engaging in-app energy experience. To maximize transparency, Tesla has developed a seamless way for customers to download and access their energy and vehicle data at any time directly from the Tesla app.



Engaging the Security Community

We are also focused on ensuring that our vehicles are the most secure on the road. Our team of world-class engineers continuously improve our systems to ensure they are always as secure as possible. And while some of the best security engineers work at Tesla, we believe that in order to design and build inherently secure systems, we must work closely with the security research community and learn from their collective expertise and diversity of thought.



Embedding Security and Privacy

To uphold rigorous standards regarding the security, confidentiality and integrity of customer and employee data, Tesla maintains a global privacy program as well as an information security program (based on the industry-recognized ISO 27001 framework), which includes written policies, processes and standards designed to protect and secure Tesla’s data environment.

Tesla maintains a current ISO/IEC 27001 certification that sets user security standards, for which we undergo yearly audits. We evaluate the health and effectiveness of our information security and privacy program through ongoing assessments, monitoring and testing.

Global Privacy Program

Guides product development and business practices across Tesla to ensure regulatory compliance by maintaining effective and standardized controls across vehicle and energy products as well as insurance and financial services

Third-Party Risk Management

Identify, mitigate and monitor risks from third parties such as vendors, suppliers and other business partners, including those in our supply chain who may require certain Tesla data to conduct operations

Product Security

A comprehensive approach to managing product vulnerabilities including conducting design and code reviews, building defense in depth protections, testing, maintaining security policies, monitoring, partnering with external security researchers and financially rewarding people outside the company who find and report vulnerabilities

Infrastructure Security

Prevention, detection and response to IT outages, security incidents or acts of nature to provide availability of underlying critical services and continuity of operations

Environment

The Future is Electric

Displacing Fossil Fuels	19
Carbon Impact of Our Products	27
Carbon Impact of Our Operations	36
Water, Circularity and Biodiversity	47

In 2023, Our Customers Avoided Releasing Over 20 Million Metric Tons of CO₂e into Our Atmosphere

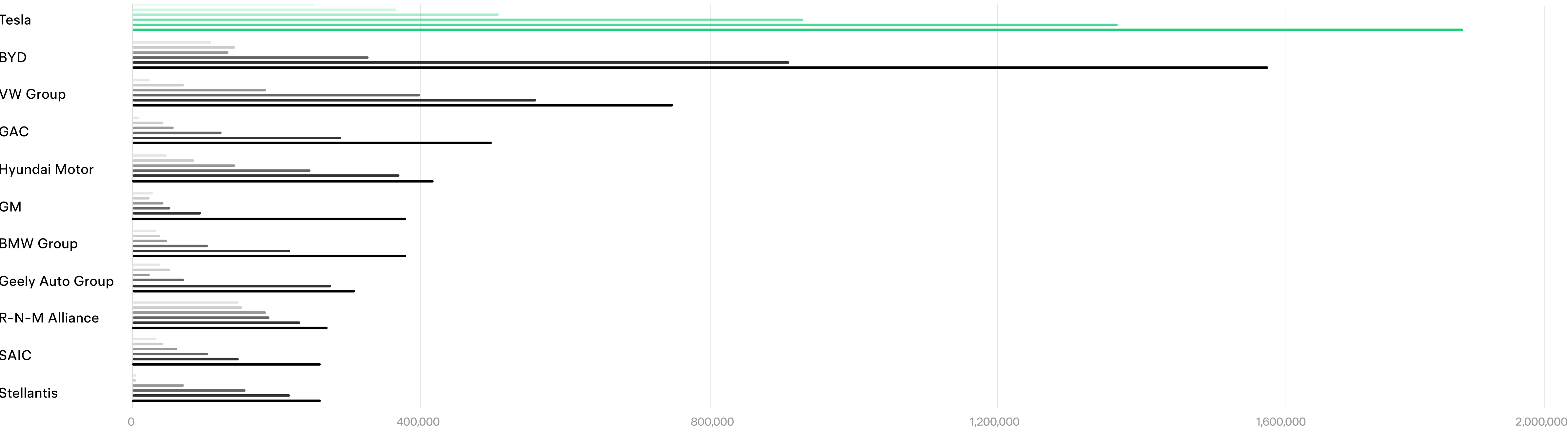
In 2023, the global fleet of Tesla vehicles, energy storage and solar panels enabled our customers to avoid emitting over 20 million metric tons of CO₂e. That's equal to about 51 billion miles of driving an internal combustion engine (ICE) vehicle.

The More Products We Deliver, the Faster We Accelerate Our Mission

Source: EV-volumes.com; microcars not included. Tesla data are production volumes; other OEMs' sales and delivery volumes are assumed to approximate their production for the year.

Electric Vehicles Produced

2018 2019 2020 2021 2022 2023



Tesla Produced and Delivered Over 1.8 Million EVs Globally in 2023

Although we are focused on our own deliveries, electric vehicle (EV) sales by all automakers need to increase. We hope that every vehicle manufacturer will strive to produce hundreds of thousands of EVs per year, as significant reductions in emissions will only be achieved with an industry-wide shift.

Emissions credit revenue is used for EV capacity expansion, which in turn displaces internal combustion engine (ICE) vehicles. In 2023, we generated almost \$1.8 billion in revenue selling zero-emission regulatory credits to other OEMs. While it is common practice today for ICE vehicle OEMs to purchase regulatory credits from other companies (such as Tesla) to offset their emissions, it is not a sustainable strategy. In order to meet increasingly strict regulatory requirements across the world, OEMs will be forced to develop truly competitive EVs.

To support our mission, we are making it as easy as possible for drivers to own and charge an EV. We opened our charging connector design to the world in 2022 and opened our Supercharger network in North America to more EVs starting in 2024. We are also sharing charge port technology with other OEMs to assist the transition of their vehicle designs to be compatible with the North American Charging Standard (NACS). This follows the opening of our network in other regions, including Europe and China.

Current Emissions Frameworks Weren't Built for a Company Like Tesla

We continue to drive the reduction of greenhouse gas emissions (GHG) from energy and transport through use of our products by our customers—this will continue to be the most impactful thing we can do to achieve our mission. The popular frameworks for measuring and reducing GHG emissions continue to not recognize this impact. They were written by and developed for well-established companies with polluting products. These frameworks do not account for the impact of emissions that are avoided through the sale of zero direct emission products (referred to in this report as “avoided emissions”).

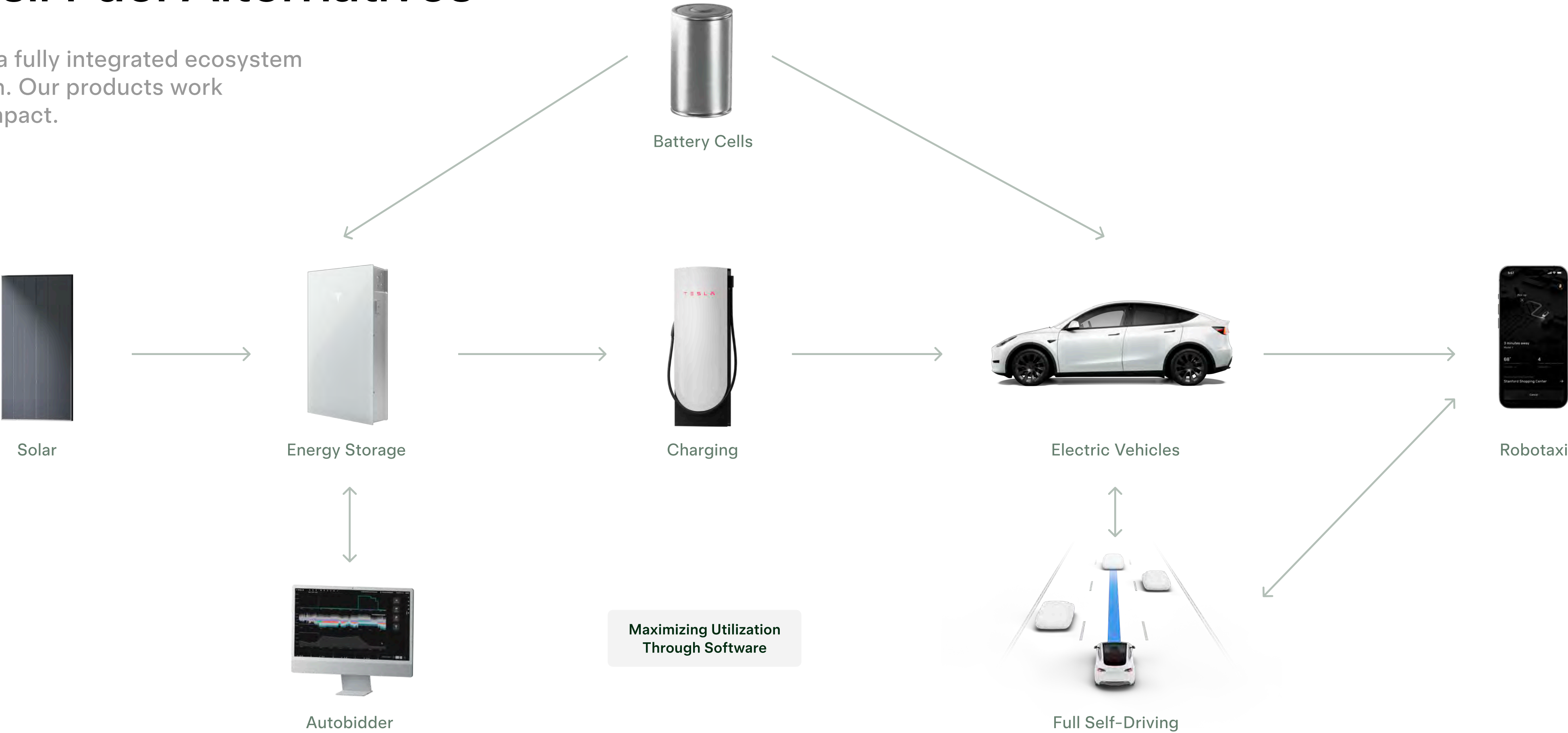
As we continue to grow, Tesla will need to build many more factories to support production of our products. Each one of these products will avoid many tons of CO₂e throughout its life.

Even as Tesla constructs more efficient factories with maximum renewable energy utilization, there will undoubtedly be incremental emissions from our growing factory footprints in the near term as we work to decarbonize all industrial processes and supply chain inputs.

There is a lot of work left to do to build a GHG-accounting system that holds polluters accountable and highlights the work being done by companies to build zero direct emission products and achieve the goal of decarbonizing the economy.

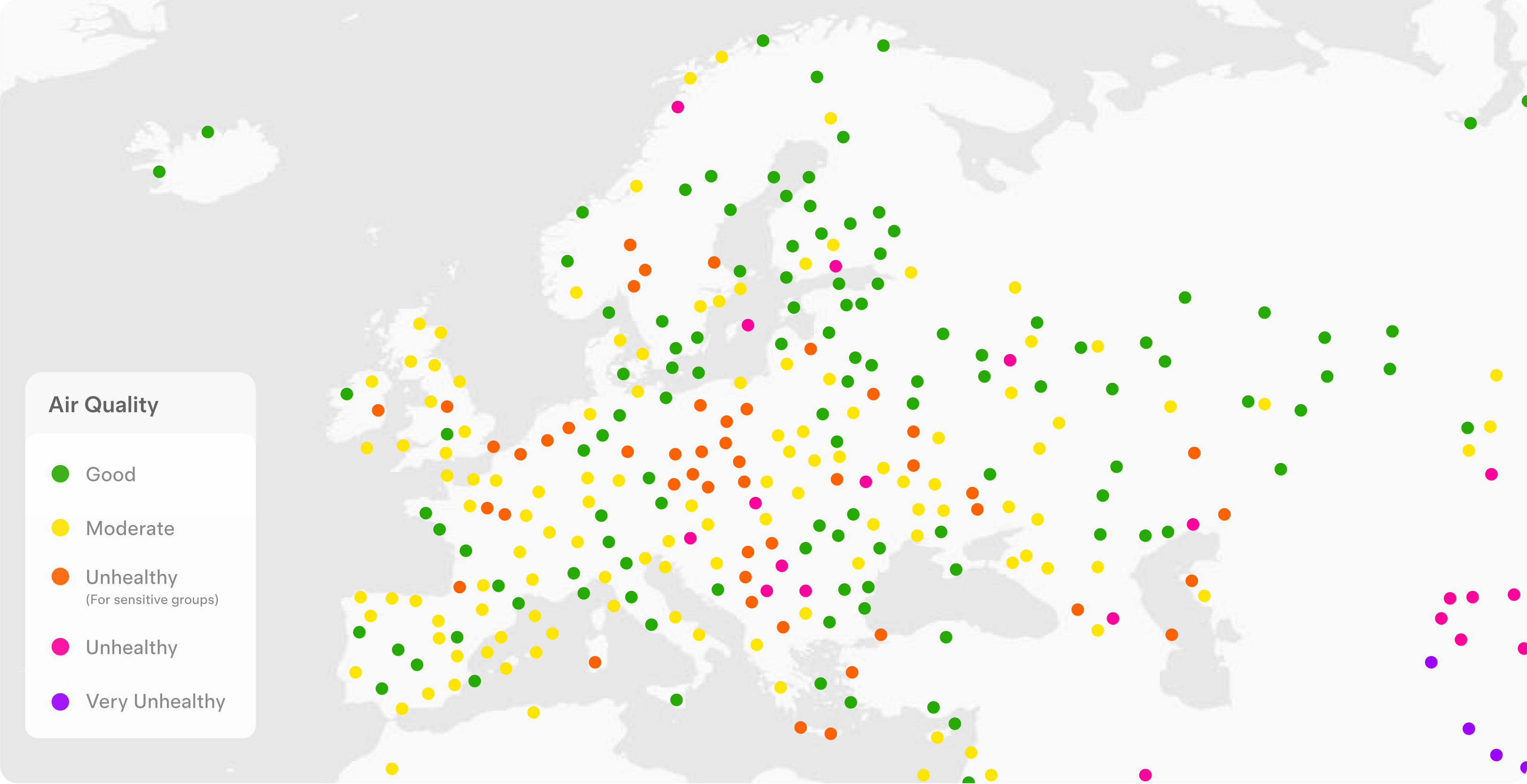
We Make Products That Displace Fossil Fuel Alternatives

We design and manufacture a fully integrated ecosystem for energy and transportation. Our products work together to maximize their impact.



Air Pollution From Burning Fossil Fuels Leads to Premature Deaths

Pollution from burning fossil fuels leads to eight million premature deaths globally each year—that accounts for one-in-five premature deaths worldwide. Our products are not just about the future of our planet, but also about addressing preventable deaths today. This is a major advantage of zero direct emission products that is often forgotten.

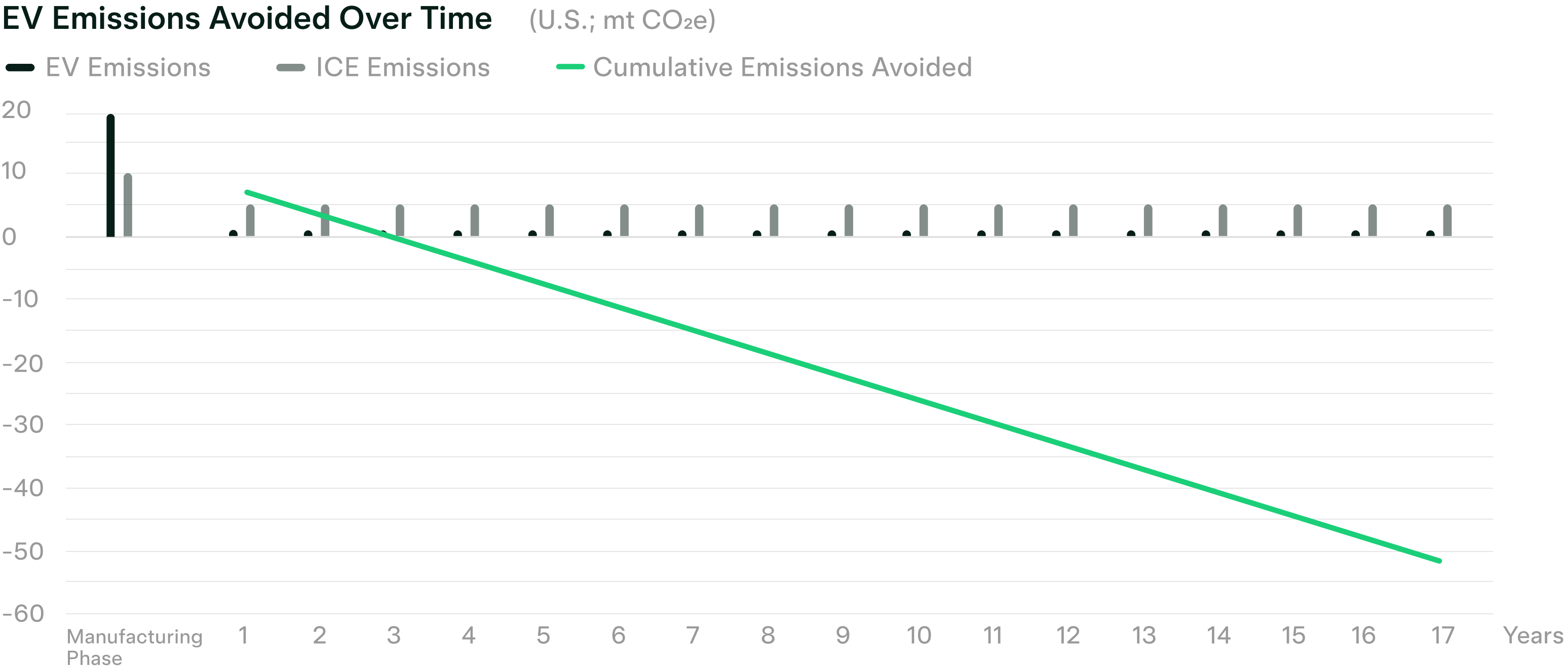


Each Tesla on the Road Avoids About 51 Tons of CO₂e

After approximately three years of driving, a Tesla EV's lifetime emissions are lower than those of a comparable ICE vehicle. While EVs today still emit more GHGs during the manufacturing phase, including emissions from the supply chain, it takes about three years' worth of driving for the total emissions from a Tesla vehicle to fall below that of a comparable ICE vehicle.

After 17 years of driving—the average life of a vehicle in the U.S.—a single Tesla vehicle will avoid about 51 tons of CO₂e. This number is conservative for two reasons: it assumes no improvement in grid emissions over time and an ICE vehicle maintains its fuel efficiency throughout its lifetime.

This year, we updated our avoided emissions calculation methodology using a global model with more primary GHG emissions data collected from our suppliers.



NEDC, WLTP or EPA Testing Cycles Do Not Represent Real-World Fuel or Electricity Consumption

We used real-world energy consumption by Model 3 and Model Y to analyze EV energy consumption. For ICE fuel consumption, we used data provided by Consumer Reports, which reports model year 2023 mid-size premium vehicles achieve 24.9 MPG on average. This translates to approximately 400 grams of CO₂e per mile once we account for emissions generated through the extraction, refining and shipment of oil.



Lifecycle Analysis Glossary

By examining every stage of a product’s lifecycle, from raw extraction to disposal, a lifecycle assessment (LCA) helps identify environmentally taxing hotspots, allows for targeted improvements and enables resource use efficiencies. The per-mile lifecycle emissions of our vehicles include emissions from upstream supply chain, electricity consumption and direct emissions from manufacturing and use-phase emissions when charged from a grid with a generation mix that reflects the geographic distribution of Model 3 and Model Y deliveries in the U.S., Europe and China. This year, we are presenting the standard-range RWD versions of Model 3 and Model Y and have significantly improved GHG emissions data accuracy. As we strive to get more real and granular data, we will continue to update our long-range and other product LCAs for future reports.

To the right are the scenarios and assumptions we're using for our analysis.

SCENARIOS

Model 3/Y*

Personal Use Grid Charged

Emissions per mile if Model 3/Y principally charged at home from the grid

Personal Use Solar Charged

Emissions per mile if Model 3/Y principally charged at home using a solar system and energy storage

Average Premium ICE

Based on an average of mid-size premium sedans and mid-size premium crossover SUVs, with a real-world fuel economy of 24.9 MPG

*In 2023, we followed the same methodology as 2022 to present the LCA as a weighted average of Model 3 and Model Y based on production share for each vehicle (for manufacturing-phase emissions) and delivery volumes in each region (for use-phase emissions). Given that Model 3 and Model Y have 70%-plus parts commonality and share many manufacturing processes, their GHG emissions are very similar.

ASSUMPTIONS

Lifecycle Emissions

Lifecycle Emissions using solar panels and Powerwall exclusively to charge Model 3/Y adds emissions to the manufacturing phase and reduces use-phase emissions to as low as zero.

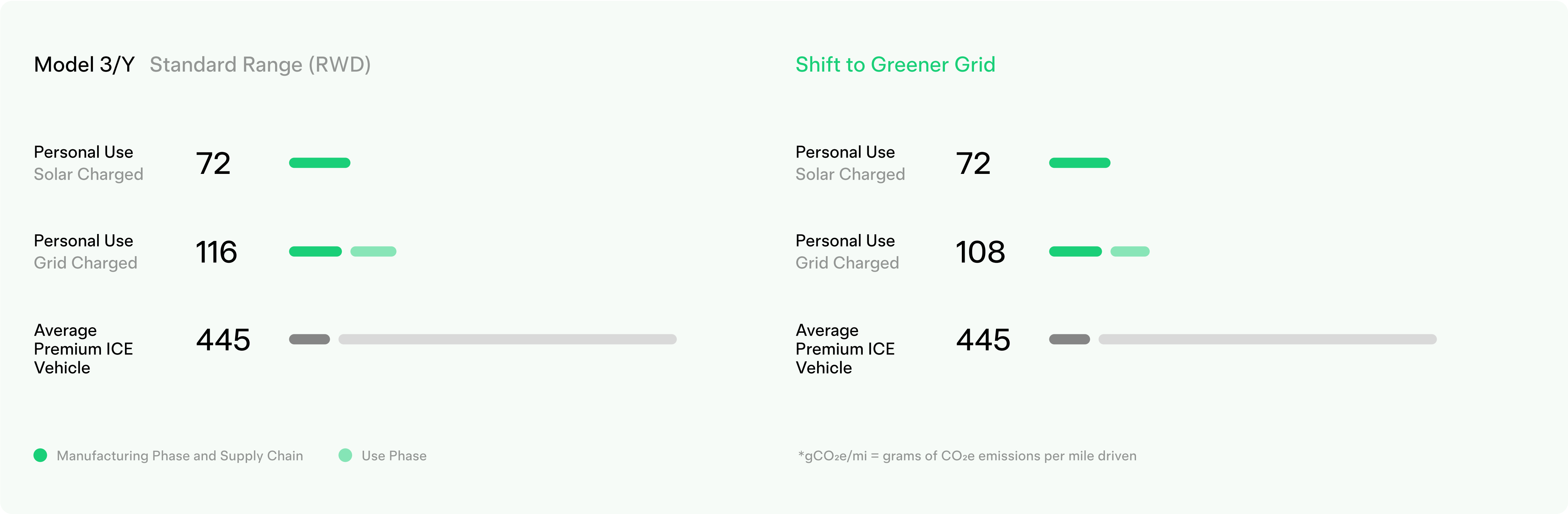
No additional renewable energy capacity on the grid during the life of the vehicle—the shape of the renewable energy adoption curve is still up for debate.

Manufacturing-phase emissions for Model 3/Y in the U.S. represent a Fremont-made vehicle, while manufacturing-phase emissions in Europe and China represent a China-made vehicle.

Average Lifecycle Emissions

United States gCO₂e/mi*

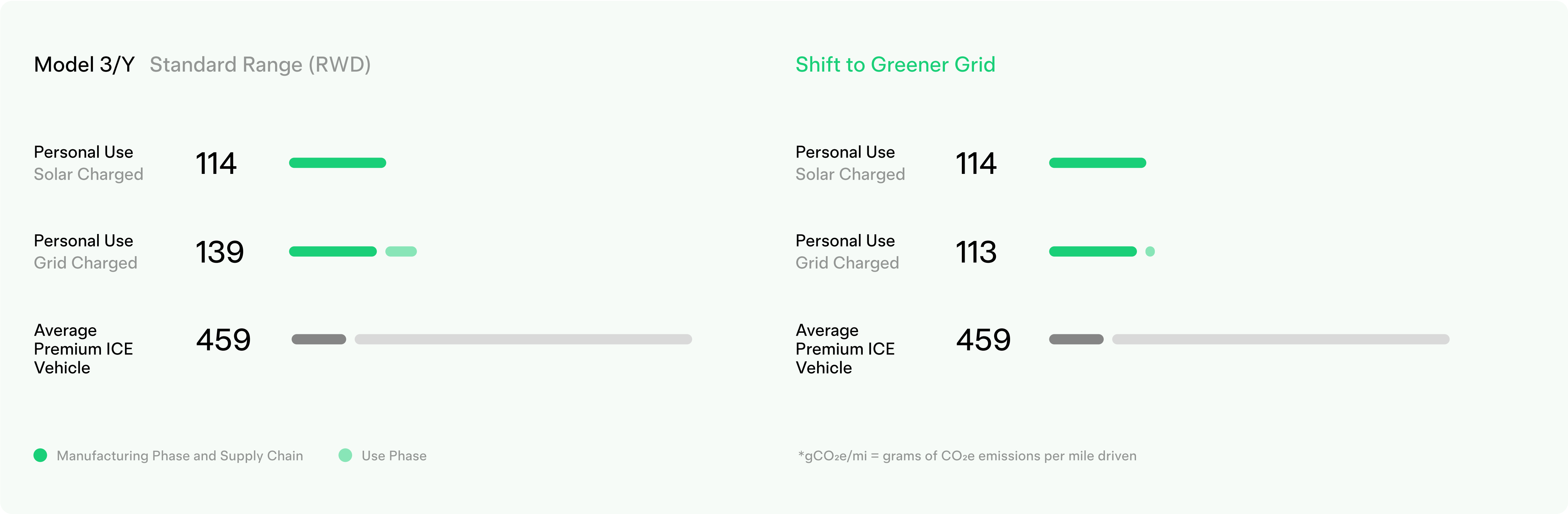
New York gCO₂e/mi*



Average Lifecycle Emissions

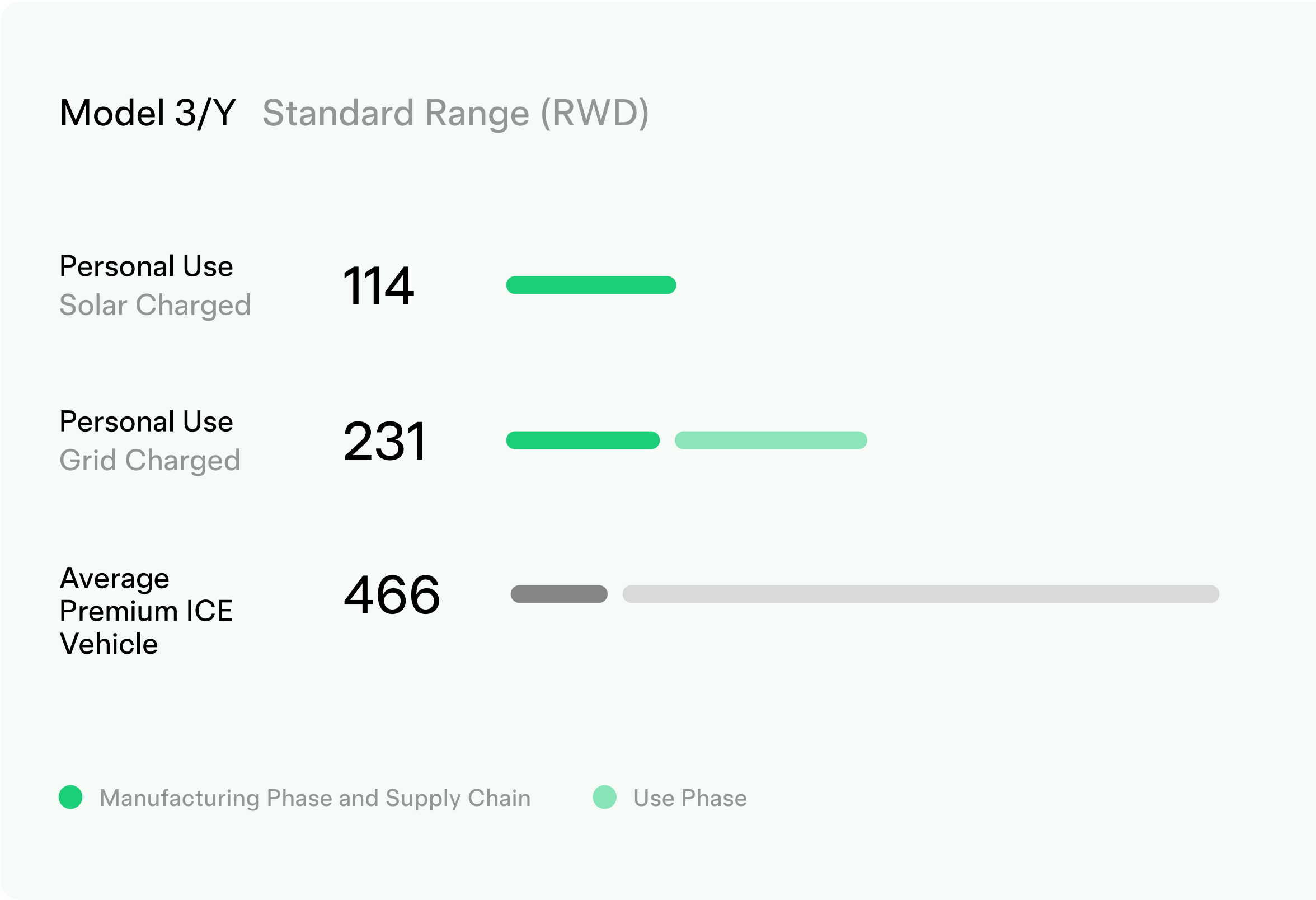
Europe gCO₂e/mi*

France gCO₂e/mi*

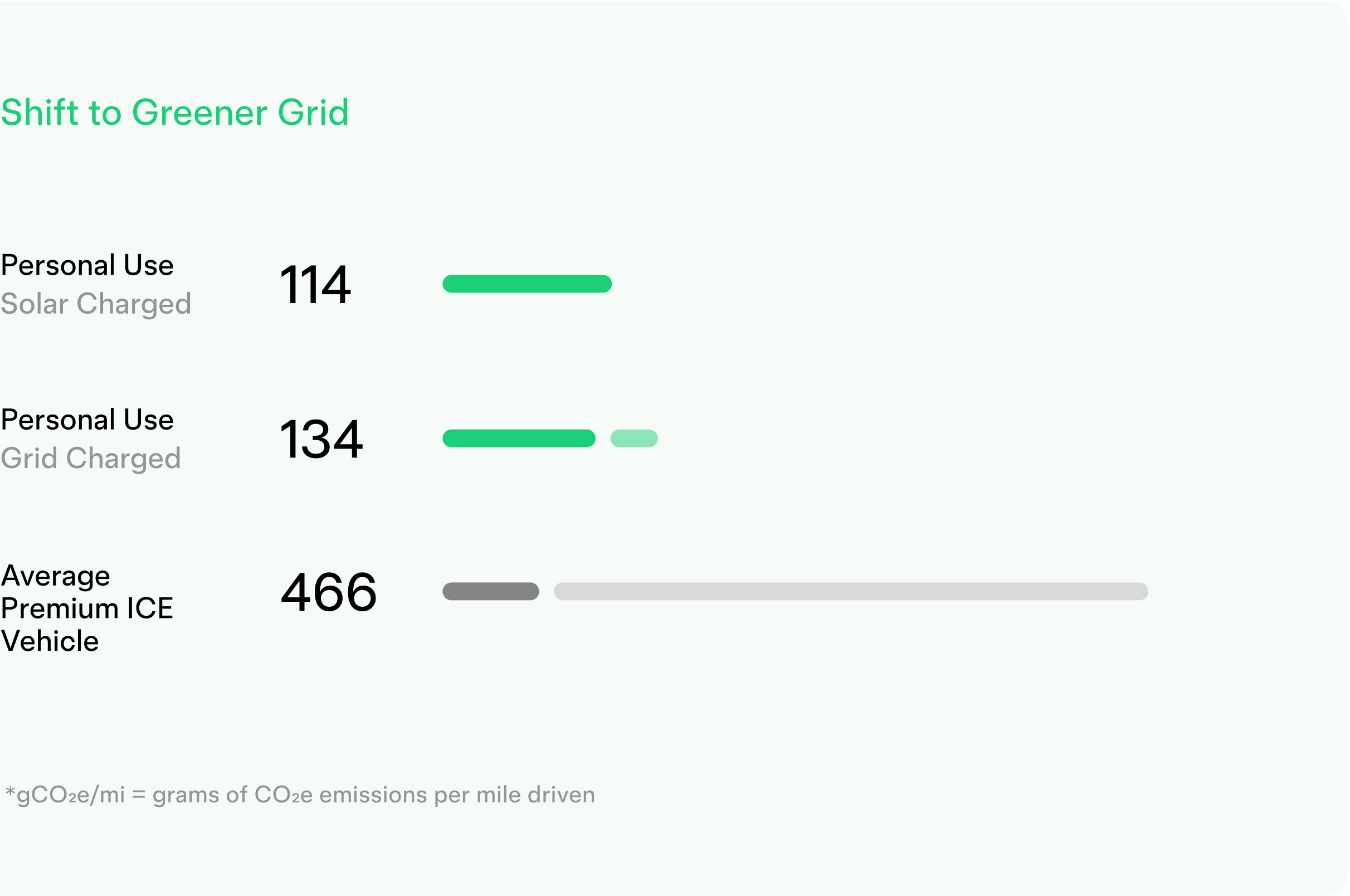


Average Lifecycle Emissions

China gCO₂e/mi*



Sichuan Province gCO₂e/mi*

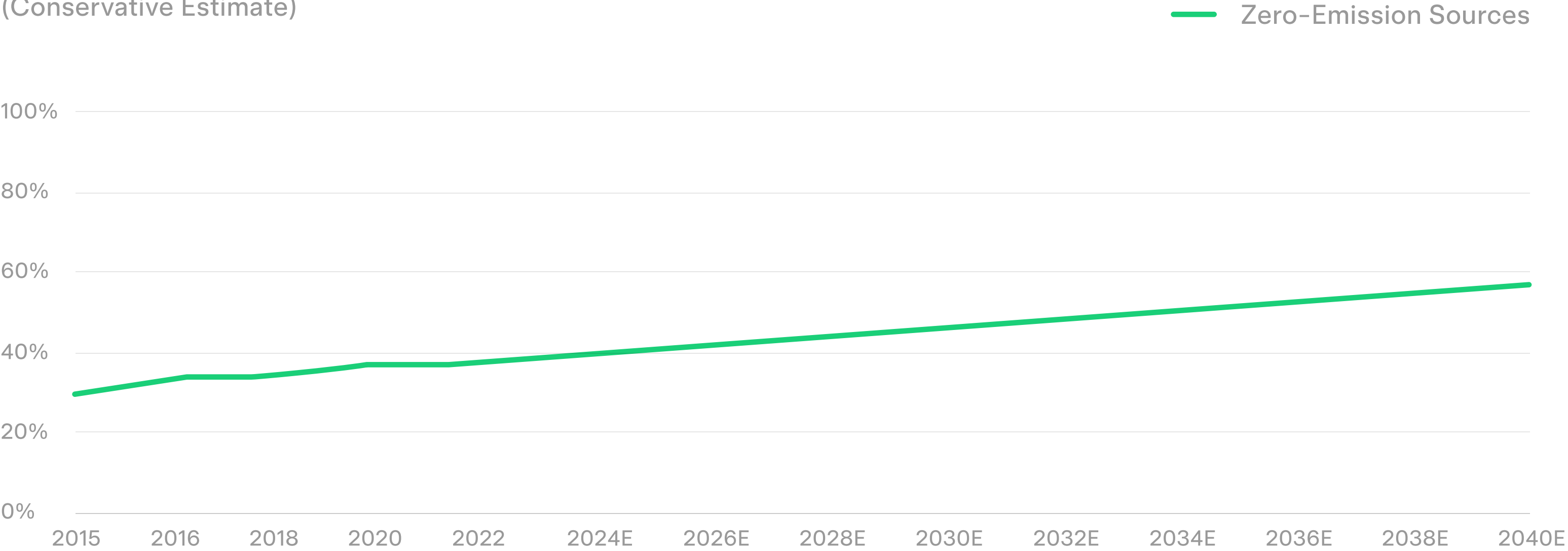


The Carbon Impact of ICE Vehicles Remains the Same Every Year of Use

The LCAs we have presented assume the same emissions per mile for our vehicles throughout their lifetime. This assumption is conservative given the grid keeps getting cleaner. While emissions per mile for EVs will improve with the grid, emissions per mile for ICE vehicles will not.

Based on publicly available sales and fleet data, we estimate that an average vehicle in the U.S. is scrapped after 17 years and slightly less than 200,000 miles of driving. As an ICE vehicle ages, its fuel efficiency only remains stable if serviced properly. Meanwhile, electricity generation to charge EVs has become "greener" over time with the addition of cleaner energy sources to the grid. EV drivers can increase their renewable energy mix by installing solar energy generation or storage systems on their homes.

U.S. Electricity Grid Generation Mix
(Conservative Estimate)



Greater Efficiency Than a Prius, Performance of a Porsche

More efficient vehicles equals less lifetime energy use. Tesla vehicles are among the most efficient EVs built to date. Model Y All-Wheel Drive (AWD) achieves 3.8 EPA miles/kWh, making it the most efficient electric SUV ever made. While achieving the best-in-class energy efficiency, our AWD models also provide impressive acceleration and speed.

Model Y
Long Range AWD

4.8s

0-60mph

135mph

Top Speed



Model 3
Long Range AWD

4.2s

0-60mph

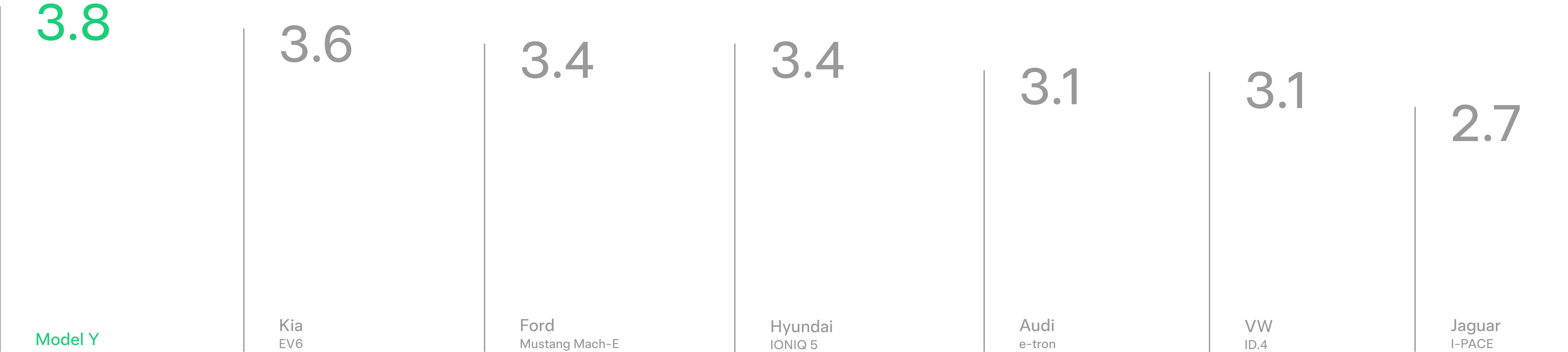
125mph

Top Speed



We Make the Most Efficient Electric SUV on the Road

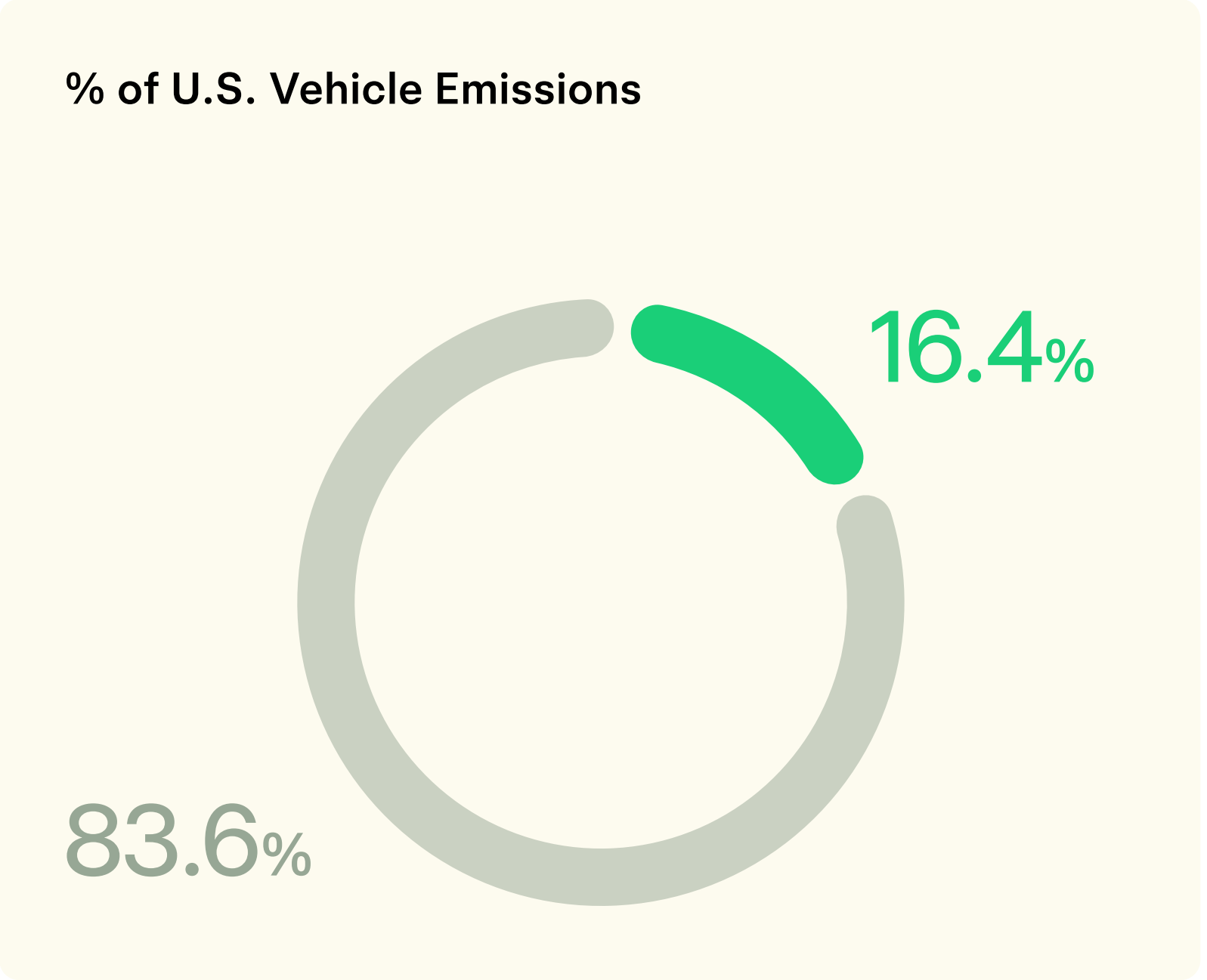
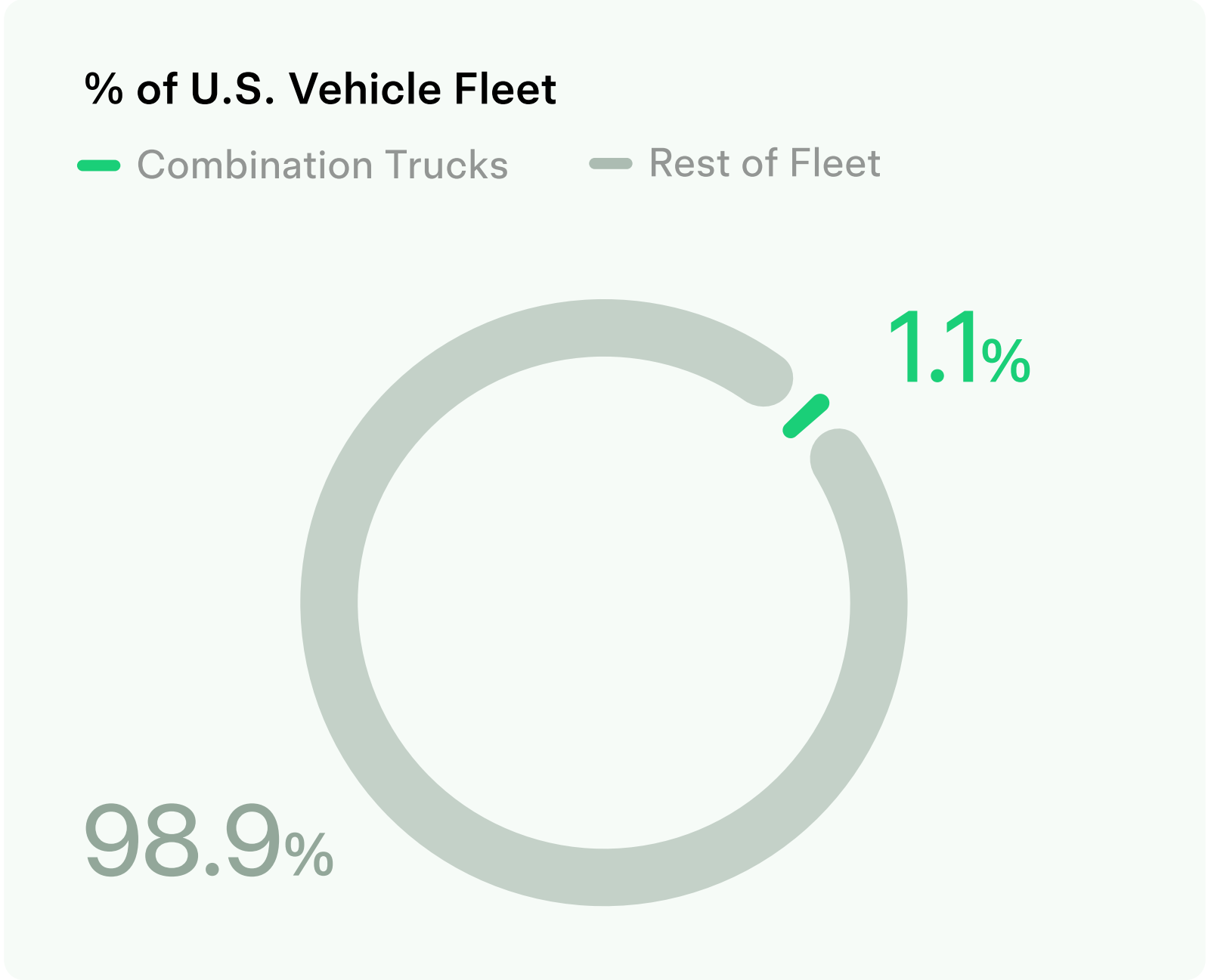
EV Powertrain Efficiency
(EPA rated mi/kWh)



Electrifying Heavy-Duty Trucks is Critical to Our Mission

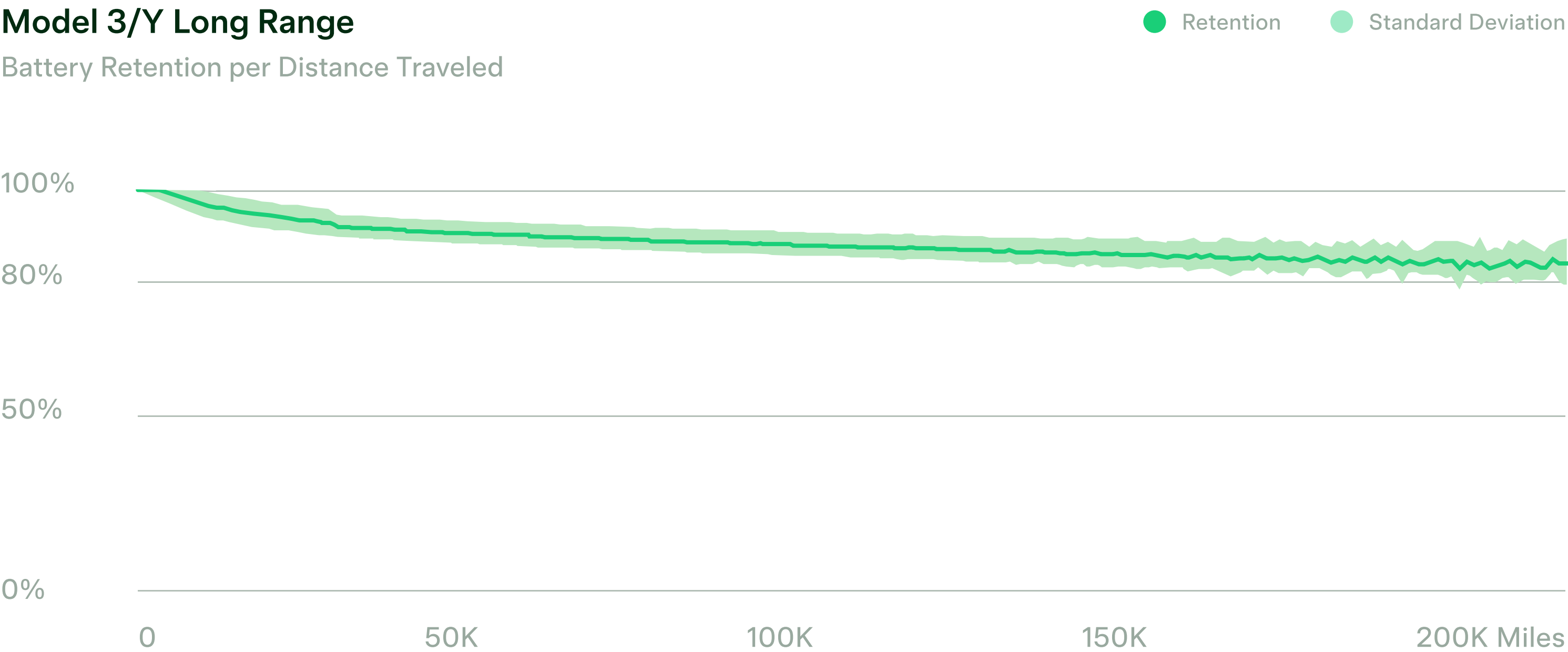
Combination trucks account for about 16% of U.S. vehicle emissions—Semi helps change that. With less than 2 kWh per mile of energy consumption, Semi can travel up to 500 miles on a single charge, fully loaded. Charging with electricity is approximately 2 times cheaper per mile than refueling with diesel. Operators can see estimated fuel savings of up to \$150,000 within their first three years of ownership.* With remote diagnostics, over-the-air software updates and fewer moving parts to maintain, operators will spend less time at service centers and more time on the road.

*Based on average Q1 2024 diesel prices in California and latest electricity rates.



Our Batteries are Designed for 200K+ Miles of Driving

Vehicle battery production can result in over six metric tons of GHG emissions, so it's important that the battery lasts as long as the vehicle. Which is why we often get asked: Will I need to replace my battery at some point in the future? The answer is no. Since we've been selling EVs for over a decade, we have a reliable data set that shows us battery degradation over time. We estimate that a vehicle gets scrapped after approximately 200,000 miles of usage in the U.S. and roughly 150,000 miles in Europe. Even after 200,000 miles of usage, our batteries in Model 3 and Model Y lose just 15% of their capacity on average, while batteries in Model S and Model X lose just 12% of their capacity on average.



We minimize the carbon impact of our operations with our decarbonization strategy

Unlike ICE vehicles, it is possible to fully decarbonize the manufacturing and lifetime use of EVs

Electric vehicles and sustainable energy products have a far better environmental impact than fossil fuel alternatives. This includes the full lifecycle: raw material mining, manufacturing, product use and disposal.

Decarbonization at Tesla

Tesla strives to achieve net-zero GHG emissions across our full product lifecycle, from mining and production through use and end of life recycling. While we have made progress in reducing our emissions intensity in the near term and made meaningful progress on building a plan to achieve net-zero emissions as soon as possible, there remains work to do to finalize this plan. Our goal is to set a target that is both meaningful and thoughtful.

With a mission to accelerate the world’s transition to sustainable energy, decarbonization is at the heart of everything we do. An ambitious stance on GHG emissions reduction is necessary to continue moving the world toward a sustainable energy economy.

We are prepared to continue our decarbonization journey, acknowledging the constantly changing landscape of technological advancements and sustainable energy markets. As we evolve, we strongly believe that starting with an ambitious strategy is not just wise, but necessary. With the sustainable energy sector ascendant, we anticipate a rising demand for zero direct emission products across energy and transportation. Despite this, our dedication to

meticulously tracking and reducing our GHG emissions remains unwavering, alongside our commitment to nurturing innovation—a fundamental aspect of our organizational identity.

In addition, we aim to transition our operational electricity load to 100% renewable electricity well before we achieve our net-zero emissions goal and to continue matching 100% of our Supercharger electricity load annually with renewable electricity.

For more information, please see our supply chain decarbonization strategy starting on page 107.



Net-zero GHG emissions as soon as possible

100%

operational renewable electricity achieved ahead of net-zero emissions

Our Data-Driven Approach to Measure and Track Our Emissions

Tesla has been measuring the GHG emissions from our full value chain in accordance with the GHG Protocol for several years, starting with our supply chain and manufacturing processes through our Sales, Service and Delivery activities. Each year, our data collection process becomes increasingly refined, prioritizing the collection of primary data over database estimates that don't accurately reflect our emissions. We've built an in-house data collection system with integrated controls that will evolve over time with our business.

We're evolving the standard approach to Scope 3 GHG emissions management

Scope 3 GHG emissions calculations are often highly academic—even when they conform to popular frameworks like the GHG Protocol. They rely on large estimations and assumptions that often lead to figures that don't reflect the true impact. Tesla is in a unique position for two reasons: we obtain primary data from the use of our products and our high level of vertical integration and direct sourcing relationships enable us to collect primary data from upstream activities, such as sourcing.

We use primary data to calculate emissions from our products

With data from over six million vehicles on the road and a fleet of solar and storage products, we can calculate our emissions at a much higher level of accuracy than most manufacturers and can therefore develop emissions-reduction solutions accordingly. This also means that we can measure our use-of-product emissions year-over-year instead of estimating their lifetime value.

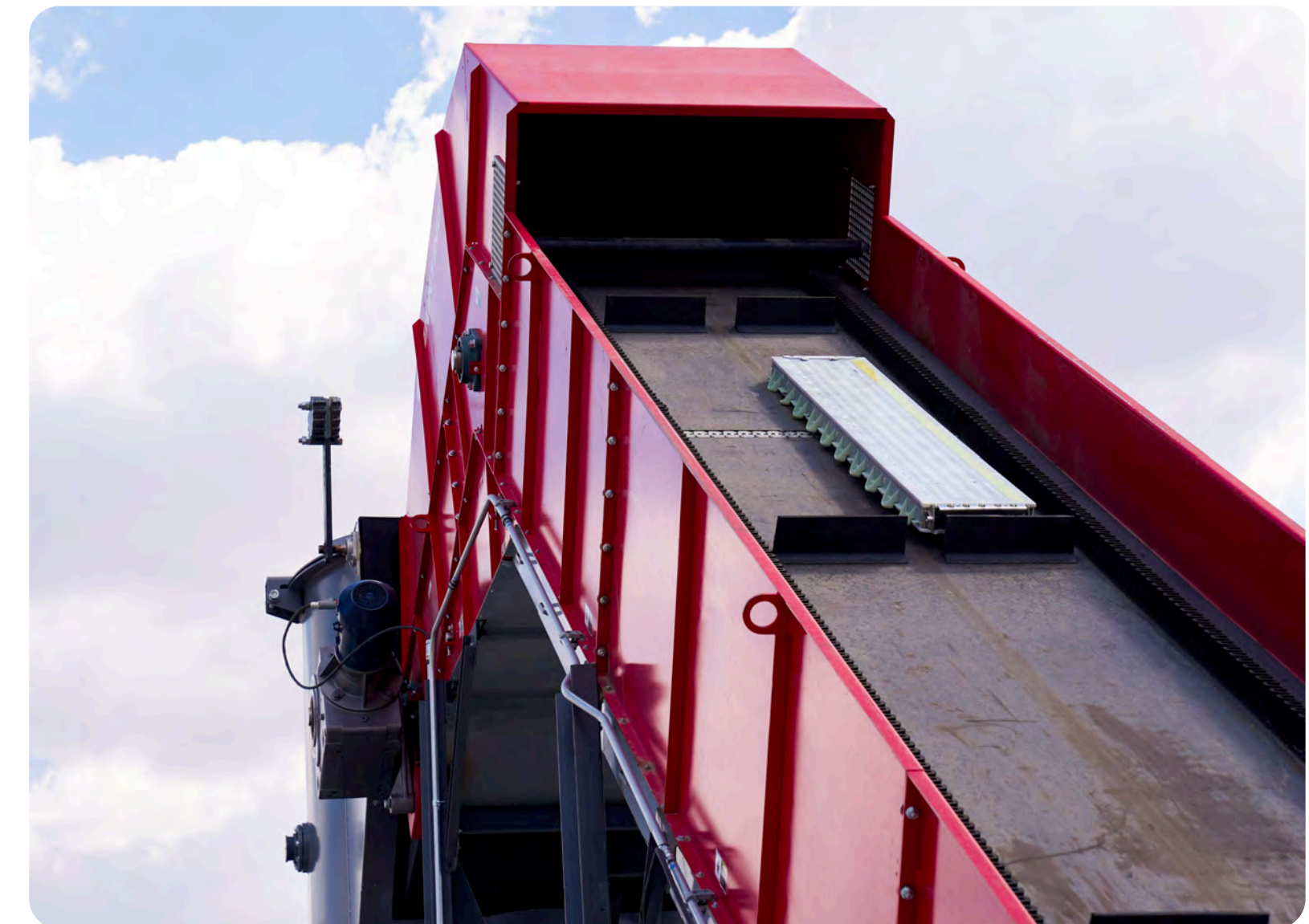
Our Data-Driven Approach to Measure and Track Our Emissions (Cont'd)

We advance innovative approaches to end-of-life emissions

Our approach to understanding the end-of-life impact of our products goes beyond standard frameworks and emission factors. Our circular solutions programming offers an avenue to obtain primary data for the end-of-life of our products. This includes gathering data on the carbon footprint of our recycling processes, allowing for more precise calculations of emissions compared to relying solely on standard global carbon footprint methodologies for battery recycling. Recognizing that our products will reach their end-of-life far in the future, we also forecast regional grid mixes to accurately model future energy scenarios.

This innovative methodology ensures that we reflect the true environmental impact of our products, setting a higher standard for GHG emissions management in the industry.

Continuously enhancing the granularity of our data collection processes across all Scope 3 categories is a priority. Given that Scope 3 emissions make up most of an OEMs' total footprint, leveraging real and accurate data empowers us to begin implementing impactful emissions reduction strategies.



Powering Our Supercharger Network With Renewables

We're powering our vehicles with renewable energy

Our global Supercharger network was 100% renewable again in 2023, achieved through a combination of on-site resources and annual renewable electricity matching. We also continue to match some of our customers' home charging in California with 100% renewable electricity, matching annually.



For 3 years in a row, our global Supercharger network was 100% renewable



Generating More Energy Than is Consumed

In 2023, Tesla solar owners generated enough zero-emissions electricity to power all Tesla locations, including manufacturing, support, research, sales, service and delivery locations—more than three times.

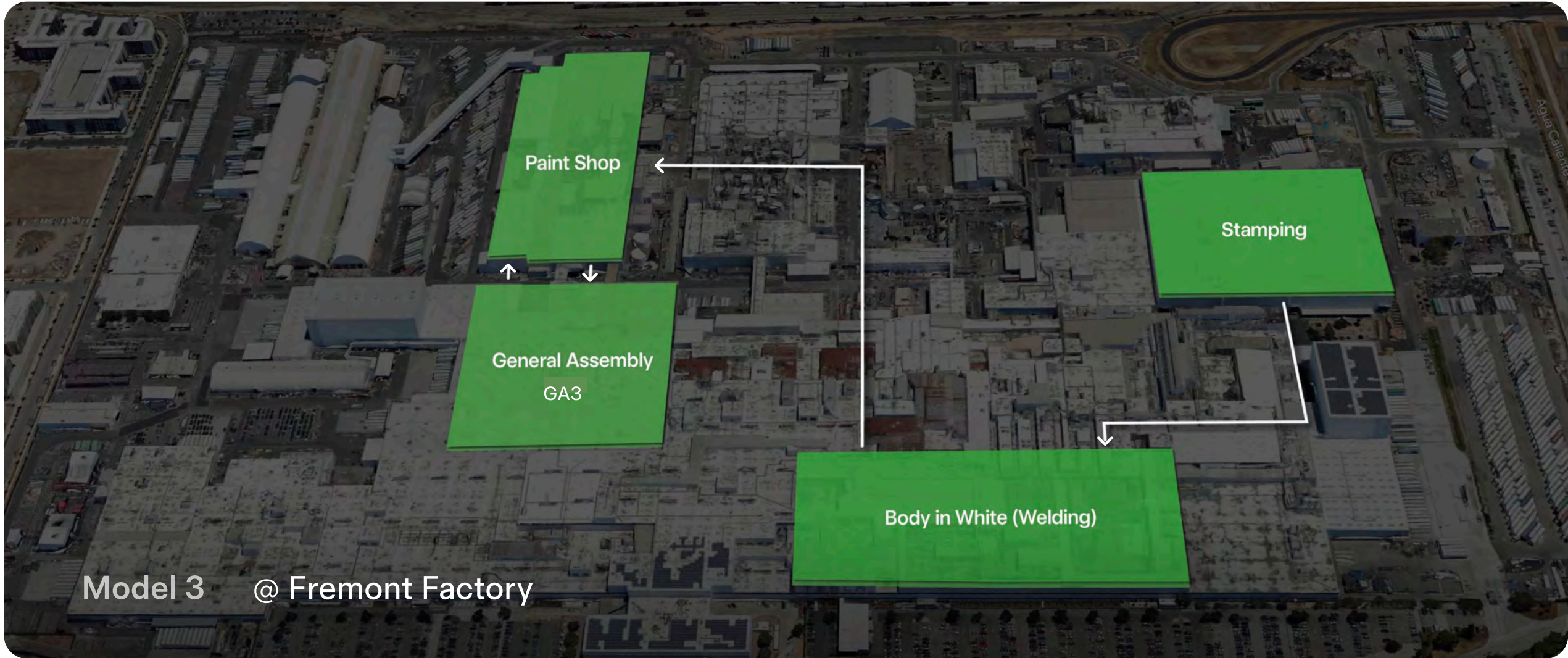
3X

the power needed for Tesla locations generated by owners of Tesla solar panels

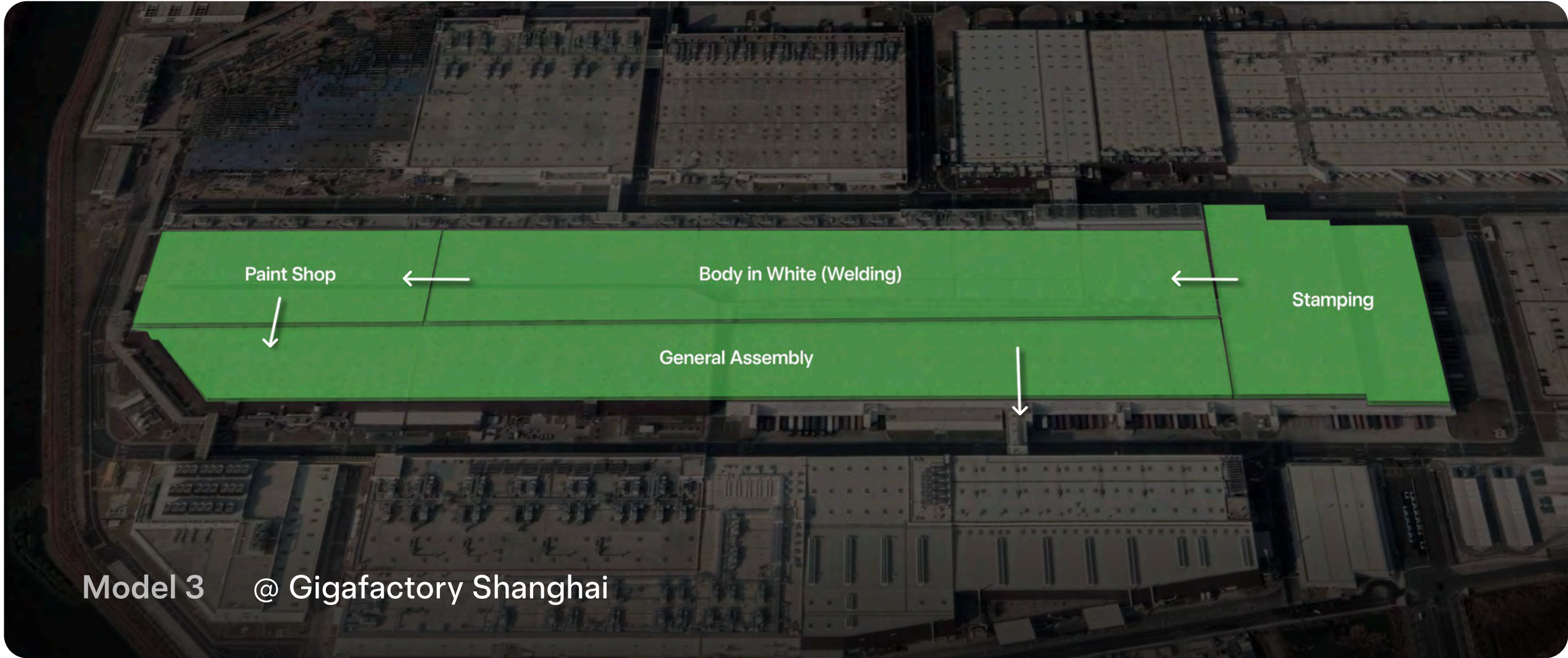


Building Sustainability into Facility Design

We continue to build each new factory to be better and more sustainable than the last. For example, at Gigafactory Texas, we chose highly efficient, insulated, low-emissivity windows to reduce building heating and cooling demand. The incorporation of waste heat recovery from compressors alone will offset over 1 MW of natural gas consumption for process heating. Our efforts are not limited to Gigafactory Texas; Gigafactory Shanghai stands as a testament to our progress, using 35% less energy per vehicle than Fremont Factory. As we continue building out new manufacturing sites, places like Gigafactory Berlin-Brandenburg and Gigafactory Texas will see further enhancements. Learnings from these sites will be integrated into future construction projects. These ongoing improvements underscore our unwavering commitment to sustainable facility design.



Model 3 @ Fremont Factory



Model 3 @ Gigafactory Shanghai

Natural Gas Reductions Across Operations

We also maintain an ongoing commitment to enhancing the efficiency of our manufacturing processes across existing factories, with a focus on natural gas consumption. In 2023, we implemented optimization controls in our plastics and body paint shops at Gigafactory Texas, aimed at increasing the efficiency of natural gas usage and thereby curbing overall consumption. Additionally, strategic adjustments to temperature, fan speed and nozzle placements in our Gigafactory Texas paint shop ovens have yielded natural gas reductions. This proactive approach extends beyond Gigafactory Texas. The evaluation and efficiency of natural gas usage across our global operations will continue to be a priority as we work to reduce emissions from this energy source.



Increasing Our Operational Renewable Electricity Load

In addition to achieving 100% renewable energy for our Supercharger electricity load, we aim to source 100% renewable electricity across our operations. We’ve already begun this journey through the design of new factories covered with solar panels. By year-end 2023, we had installed 46,500 kW of solar at our factories, with the largest installation at Gigafactory Texas. We will continue to add more renewable energy to serve our Tesla sites.

Procuring More Renewables for Operations

In addition to on-site renewable electricity, we are matching our operational energy usage through the procurement of more renewables. We buy electricity directly from a mix of renewable energy projects through long-term Power Purchase Agreements (“PPAs”) on the grids where we operate. Spanning California, Texas and Germany, we’ve secured almost 140 MW of clean energy generation capacity with a majority coming online between 2023 and 2024.

As we expand our operations and footprint, we plan to match remaining operational energy consumption through renewable energy purchases.

100%

of Gigafactory Berlin-Brandenburg’s energy usage was matched with renewable electricity in 2023

100%

operational renewable electricity achieved ahead of net-zero emissions

Greening Our Fleet and Logistics

As a company that produces inherently sustainable products, we see an opportunity to deploy Tesla vehicles to help reduce Tesla's carbon footprint. In 2020, EVs made up ~65% of our Mobile Service fleet. By year-end 2023, we increased this figure to almost 90%. We also added 300 Tesla-owned EVs to our operational fleet in 2023.

We've started to expand our product use into upstream and downstream logistics as well. In 2023, we began using our Semis to deliver inbound battery packs from Reno to supply Fremont Factory. The lifetime internal fleet miles has reached approximately 800,000 miles, which has allowed us to avoid emitting almost 650 metrics tons of CO₂e into the atmosphere. We aim to grow the integration of our Semis for the delivery of our products to customers.

~90%

of Tesla's Mobile Service fleet were EVs by year-end 2023



Reducing Our Carbon Footprint Even Further

Dynamic Controls for Energy Efficiency

In 2023, AI Control for HVAC was expanded from Nevada and Texas to now include our factories in Berlin and California. Additionally, the number of controls in Nevada increased to nearly half of the total HVAC infrastructure. The AI Control policy enables HVAC systems within each Gigafactory to work together to process sensor data, model Gigafactory dynamics and apply control actions that safely minimize the energy required to support production. AI Control is primarily deployed on systems that heat or cool critical Gigafactory production spaces and equipment. To ensure safe operation, AI Control continuously communicates with the preexisting standard control logic of each system. In the event of any AI Control error, each system seamlessly reverts to standard control. As a result, as of 2023, there have been zero safety incidents or production interruptions related to AI Control.

Optimizing Battery Cell Manufacturing

In order to reduce the cost of our vehicles and batteries, we also need to use less energy to produce them. Tesla has an innovative approach to manufacturing cells using a dryelectrode process. Current electrode production processes involve mixing liquids with cathode or anode powders and using massive machinery to coat and dry the electrode. Since this process involves large ovens, today's cell production consumes a lot of energy. The dryelectrode process allows for the direct transition from a cathode or anode powder to an electrode film, reducing energy consumption in the overall cell manufacturing phase by more than 70% based on our latest analysis.

We Minimize Water Usage Throughout Our Operations

Water is becoming increasingly scarce as the climate changes

We are reducing our water usage throughout our operations as much as possible, prioritizing direct use in manufacturing. In the following section, we outline initiatives we are taking at Gigafactory Berlin-Brandenburg and Gigafactory Texas to reduce water consumption per vehicle (including in the production of battery cells).

Producing an EV requires less water than producing an ICE vehicle

Each automaker may draw their boundaries slightly differently, depending on how vertically integrated they are. According to the latest publicly available figures, Tesla withdrew less water at facilities dedicated to vehicle manufacturing per vehicle produced than the majority of established automakers.

Global Water Use per Vehicle Produced by Tesla Is Coming Down Over Time

m³ of Water per Vehicle Produced

3.37

Industry Avg (Latest)

3.27

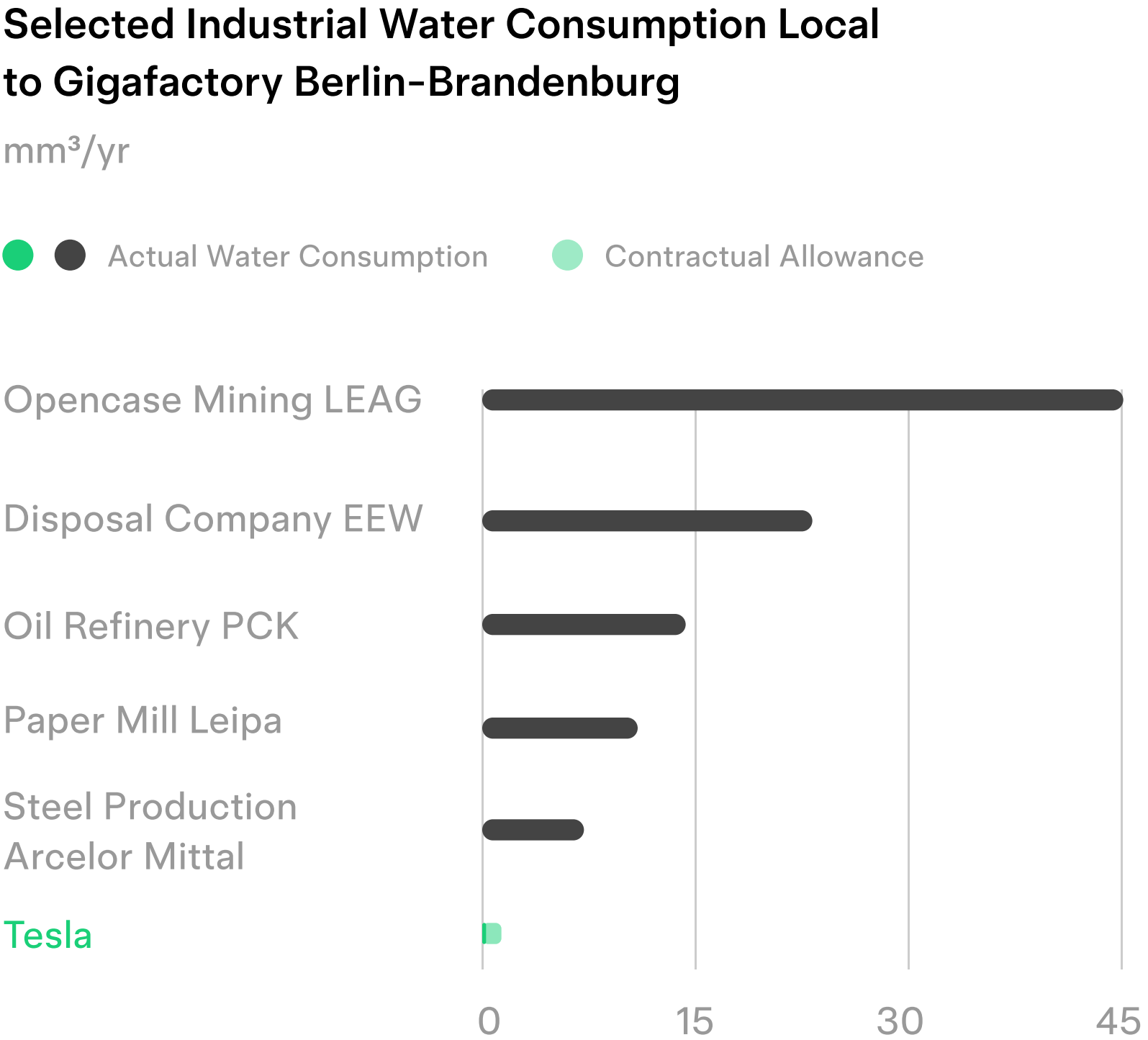
Tesla (2018)

2.48

Tesla (2023)

Tesla is a very small industrial water consumer in Brandenburg

Gigafactory Berlin-Brandenburg was designed to consume as little water as possible. Compared to other industrial companies near the factory in East Brandenburg, Tesla consumes very little water, despite producing hundreds of thousands of vehicles per year. In fact, while Tesla has a contractual allowance to consume 1.4 million cubic meters of water per year, we only consumed a fraction of that—0.45 million cubic meters—in 2023. We continue to find ways to minimize our water usage, including through the launch of an industrial water recovery and recycling plant onsite that recycles up to 100% of the factory process waste water. See our [latest video](#) for more information.



Source: Environmental Ministry of Brandenburg (August 2023); Tesla

Setting a New Standard for Water Use per Vehicle

Water-Intensive Process Optimization

We are constantly optimizing or eliminating water-intensive production processes across our operations. At Gigafactory Berlin-Brandenburg, we implemented hybrid cooling towers, eliminated quench tanks in casting and introduced cascade rinsing systems in the paint shop and battery can wash process. In 2023, we introduced various efficiency processes within our water-intensive paint shops to reduce overall water consumption at Gigafactory Texas.

Rainwater and Condensate Harvesting and Reuse

We are planning to capture at least 25% of roof runoff in a central underground storage system in Gigafactory Texas. Rainwater will be recycled for use in the cooling of manufacturing equipment. In an average year, such systems should save an estimated 14 million gallons of potable city water. Additionally, as hot, humid outdoor air is conditioned, water condenses out of the air. Typically, this condensate is discarded as wastewater. At Gigafactory Texas, we plan to use this condensate in our cooling towers and process water systems to offset incoming site water. Based off latest estimates, this could result in 13.6 million gallons of water conserved annually.

Reclaimed and Recycled Water

The “cooling tower makeup” is the single biggest contributor to water usage in a vehicle factory after paint operations. As water that cools machinery evaporates, it needs to be topped up regularly. The total cooling tower makeup could be offset entirely by non-potable sources such as rainwater or wastewater. Using locally treated wastewater could result in offsetting the entire annual “cooling tower makeup” water demand with non-drinkable uses. We have started using reclaimed water for our landscape irrigation needs at Gigafactory Texas. Once fully deployed, we expect this to save just under 150 million gallons of potable city water annually.

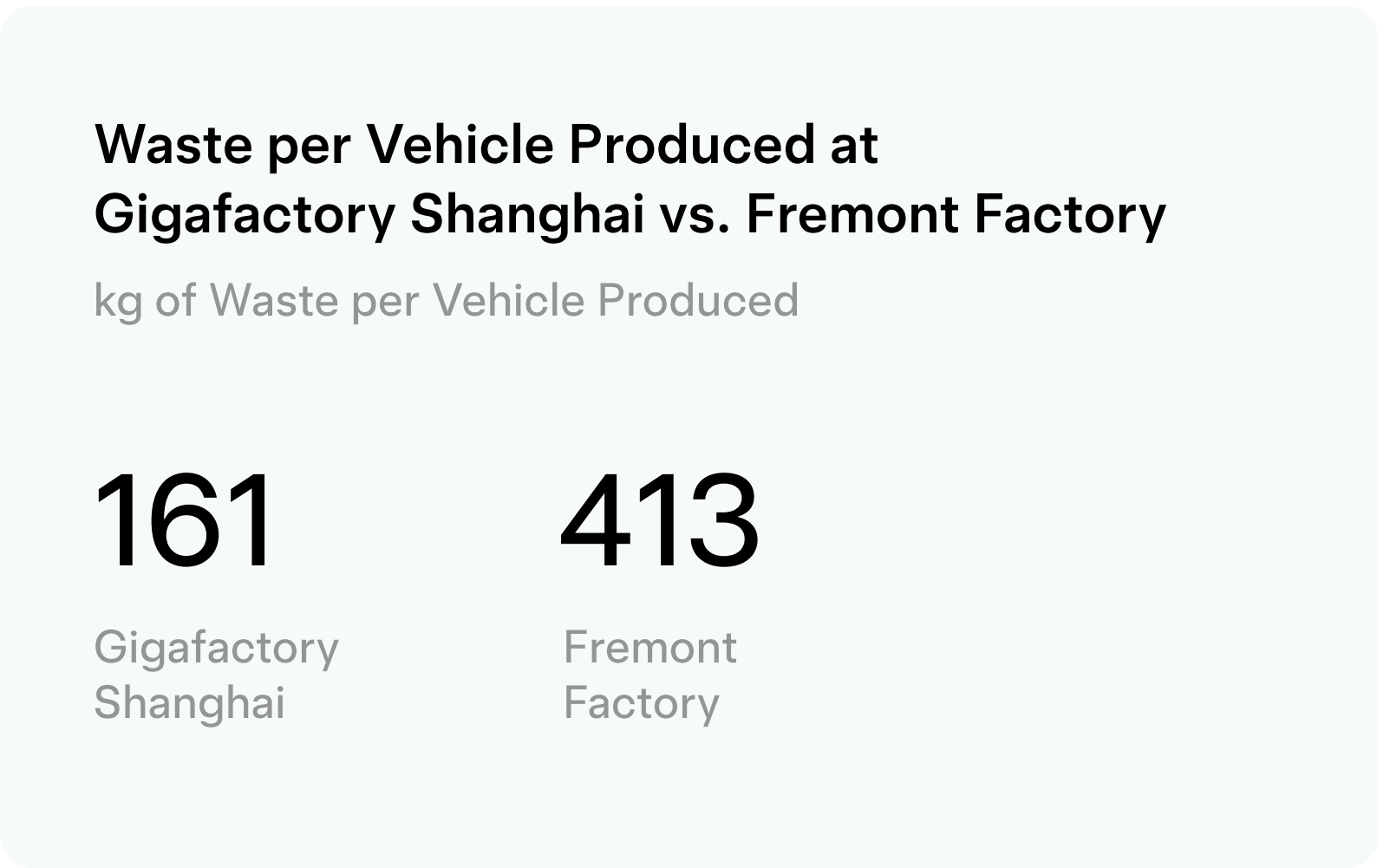
A note about water usage and power generation

It’s important to note the dual benefits of our solar energy products in reducing GHGs and minimizing water consumption. While the impact of power generation on emissions is widely recognized, its effect on water usage often goes unnoticed. Power generation ranks among the top causes of water withdrawal in the U.S., as water for thermoelectric power

is used to generate electricity with steam-driven turbine generators and to cool power-producing equipment. This means that every kilowatt-hour of clean solar energy produced not only lowers GHG emissions, but also lowers water consumption.

As We Build More Efficient Factories, Our Waste per Vehicle Decreases

Our legacy manufacturing operations at Fremont Factory will always produce more waste per vehicle than our newly designed factories. First, because the automotive supply chain doesn't have a strong presence on the West Coast of the U.S., many components need to be shipped from long distances to our Fremont Factory, requiring excessive packaging and creating more waste than necessary. Second, modern factories are better designed for material flow. Trailer entry points surround the whole factory, which means that components can be offloaded precisely at the part of the factory where they are needed.



Circular Solutions

We are driving circularity across our value chain

In our commitment to circularity within our value chain, we prioritize recycling materials to minimize waste. The vast majority of generated waste—such as paper, plastics metals and even water—is recyclable. At Gigafactory Shanghai, for example, just 6% of total waste generated in 2023 was not recycled.

At Gigafactory Texas, we initiated a recycling program aimed at optimizing the reuse of scrap metals in our manufacturing processes. Particularly, we recycle aluminum scrap for use in our castings in Model Y. Model Y castings can use primary aluminum and a diversified feedstock of recycled aluminum, including scrap from our operations as well as recycled components from non-Tesla vehicles, such as aluminum wheels.

Central to our circularity efforts is a strategic focus on battery recycling. We continue to enhance our measurement and tracking of minerals from extraction to the end-of-life of our products. As our operations expand, we will strategically identify additional recycling opportunities.

We know that collaboration with external stakeholders is crucial to our circular solutions journey. We partner with stakeholders outside Tesla to increase accuracy around the carbon impact of our materials.

See page 108 for more information on supplier engagement.

See pages 110-112 for more information on our battery recycling efforts.

90%

of manufacturing waste recycled in 2023



At Gigafactory Texas, all battery manufacturing waste (from cell to battery pack) was recycled in 2023

Biodiversity

We work to preserve the natural environments around our Gigafactories. At Gigafactories Texas, Nevada and Berlin-Brandenburg we’ve taken steps to improve the surrounding ecosystems while minimizing our own footprint. Initiatives have focused on reintroduction of native species in areas previously disrupted at our sites.

In Texas, for example, the land now used for our factory was previously a sand and gravel mine dating back to the 1970’s. Following mining operations, the land was left with vast areas devoid of vegetation. The land required significant reclamation to restore the area to a more stable and ecologically functional state.

Current initiatives at Gigafactory Texas are focused on fostering diverse plant and animal life and restoring ecological balance to allow for the natural recovery of the site.

Gigafactory Nevada partnered with a team of ecologists at the University of Nevada, Las Vegas to conduct habitat surveys to better understand and manage biodiversity on site. We recognize the need to continue taking action to restore, maintain and enhance our local ecosystems.



At Gigafactory Texas, over 30 native plant species were planted

300

native seedlings were planted in areas around Gigafactory Nevada previously disturbed by construction

Product & Safety

Better in Every Way

Making EVs Affordable	53
Freedom to Travel	57
Maximizing Safety	61
Building the Grid of the Future	71

We make products that **people love**

Consumers are unlikely to buy products just because they have a low lifetime carbon footprint. They need to be better in every way—safer, more affordable, faster and more fun. We are not just trying to build “green” products; we are committed to building the best products, period.

Model Y is Priced Below the Average New Vehicle in the U.S.

The accessibility of our products is fundamental to our mission. Model Y is priced on par with premium ICE vehicle equivalents and below the average new car selling price in the U.S. Unfortunately, most other EVs on the market today are often priced at over a \$10,000 premium compared to their direct ICE vehicle equivalents. Even our most affordable Model 3 comes standard with superior equipment and software—such as Autopilot, over-the-air software updates, 4G connectivity and, in our view, the best infotainment system on the market.

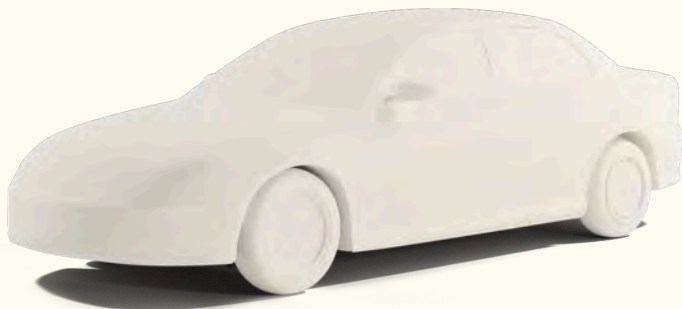
Starting Price
(Before Incentives)

Model Y
Long Range (RWD)

\$44,990



**Average
New Vehicle**



\$47,244

Model Y Total Cost of Ownership per Mile is Similar to Mass-Market ICE Vehicles

While the "sticker price" of Model Y is similar to an equivalent BMW or Audi, the lifetime running costs of EVs are lower than those of ICE vehicles due to lower maintenance costs and cheaper electricity.

Electric vehicles are less expensive to fuel than gasoline powered vehicles. The cost of electricity to power Model Y is up to 3 times lower than a comparable ICE vehicle. This results in approximately \$7,000 of fuel savings over 5 years and 60,000 miles.

For more information, visit [Tesla.com/ModelY](https://tesla.com/ModelY)

Total Cost per Mile
(5 Years, 60,000 Miles)

Model Y
Long Range (RWD)

\$0.70



BMW X3
\$1.17

Honda CR-V
\$0.68

Toyota RAV4
\$0.68

Making EVs Even More Affordable

Our goal is to displace fossil fuels by selling as many Tesla products as possible. To achieve this goal, we need to make our products even more accessible. Affordability begins with how much it costs us to produce our vehicles. We were able to reduce the cost to build a single vehicle by almost 50% since 2018 with the introduction of Model 3 and Model Y as well as the deployment of new, more efficient factories. And we aren't done yet. During 2023 Investor Day, we outlined our goal of reducing costs even further with the introduction of new vehicle and manufacturing technologies.

50%

reduction in the cost to build a single vehicle since 2018



People Use Their Tesla as Their Primary Vehicle

Our data shows that our customers drive Tesla vehicles more than the average vehicle in the U.S., suggesting that they use their Tesla as their primary vehicle. Surveys show that range and charging concerns (real or perceived) are a key reason why many people do not replace their ICE vehicle with an EV. The more confident owners are that their EV can be used for errands, commuting and long road trips, the less they will feel the need to supplement their EV with an ICE vehicle.

Average Annual Miles Driven
(United States)

13,768

Model Y



11,142

Average Vehicle



Freedom of Travel is the Reason People Buy Vehicles in the First Place

Consumers do not buy a vehicle that can meet most of their driving needs—they buy a vehicle that meets all of their driving needs. Since its introduction in 2012, we have increased the range of Model S by over 50%—from 265 miles to 402 miles of range for the long-range version. Our focus on energy efficiency—achieving superior range from the same sized battery—has allowed us to continue to increase range while keeping the battery size relatively stable.



Incredibly Fast Charging Times for V3 and V4 Superchargers

Superchargers can recover up to

200 miles of range

In about

15 minutes of charging

Chargers That Just Work



Average Uptime of Supercharger Sites*

*Uptime of Supercharger sites reflects the average percentage of sites globally that had at least 50% of their daily capacity functional for the year.



We Design Our Vehicles to Be as Safe as Possible

All Tesla safety features come standard

Tesla vehicles are engineered to be some of the safest in the world. Our vehicles are equipped with specifically designed crumple zones, airbags and pretensioning seatbelts—among many other technologies. Beyond the star ratings, we push ourselves to learn more and more about passive and active safety from our fleet. Our safety principles are:



Safety is our core customer experience



The safest crash is no crash






Safety optimization is fleet data driven and deployed at scale

All Tesla vehicles built since October 2016 come with a suite of external cameras, additional sensors and onboard computing that enable advanced safety features like Automatic Emergency Braking, Lane Departure Warning, Forward and Side Collision Warning, Obstacle-Aware Acceleration, blind spot warnings, vulnerable road-user detection and more—all of which continue to improve over time through over-the-air software updates. We deploy these updates to our vehicles at our customers' convenience without a trip to a Service Center. Connectivity is a hallmark of Tesla ownership and software updates continually enhance the customer experience.








Not All Active Safety Systems are Created Equal

Our active safety features are powered by cameras, a neural-net computer and learnings from our fleet of over six million vehicles with billions of miles driven. Built on a deep neural network, Tesla Vision deconstructs the vehicle's environment at greater levels of reliability than classical vision processing techniques can. The system also continually improves over time with accumulated fleet miles.

Safety Assist Rating				
	Model X	Model 3	Model Y	Model S
	94% ¹	94% ¹	98% ²	98% ²
	94% ¹	94% ¹	98% ²	Not Rated
	Not Rated	Superior	Superior	Not Rated
¹ 2019 Safety Assist Ratings ² 2022 Safety Assist Ratings				

Euro NCAP Safety Assist Rating				2020-2022
Tesla Model Y				98%
Tesla Model S				98%
NIO ET7				95%
BMW 2 Series AT				92%
WEY Coffee 01				94%
BMW X1				92%
ORA Funky Cat				93%
Lexus NX				91%
Nissan Ariya				93%
Subaru Solterra				91%
WEY Coffee 02				93%
Toyota bZ4X				91%

Exceeding Safety Standards Across Four Continents

					
Model 3	★★★★★ 2018	 2022	Best in Class ★★★★★ 2019	Top Performer ★★★★★ 2019	Top Rating Occupant Safety Active Safety 2021
Model Y	★★★★★ 2020	 2023	Best in Class ★★★★★ 2022	Top Performer ★★★★★ 2022	Top Rating Occupant Safety Pedestrian Safety Active Safety 2021
Model S	★★★★★ 2013		Best in Class ★★★★★ 2022	★★★★★ 2014	
Model X	★★★★★ 2017		Best in Class ★★★★★ 2019	Top Performer ★★★★★ 2019	

Exceeding Safety Standards Across Four Continents (Cont'd)

Model Y is our latest vehicle to earn a five-star safety rating from the European New Car Assessment Programme (Euro NCAP). As part of this assessment, Model Y received the highest overall score among any vehicle tested under Euro NCAP. Model S and Model Y both received the highest overall safety scores among every vehicle tested by Euro NCAP in 2022.

In the updated and tougher IIHS Side MDB 2.0 crash test (involves 82% more energy than the original 1.0 version of this crash model), the 2023 Model Y secured a Top Safety Pick+ Rating for overall crash safety from the Insurance Institute for Highway Safety (IIHS) despite more stringent eligibility.

Model Y

5-Star Safety Euro NCAP, 2022
Top Safety Pick+ Rating IIHS, 2023



Safety is Enhanced With Driver-Assist Technologies

For more information about our methodology, see our [Vehicle Safety Report](#).



Miles Driven Before One Accident

Million Miles (2023)

Tesla Vehicles
With Driver-Assist
Technologies Engaged

5.64

Tesla Vehicles
No Active Safety

1.24

Total
U.S. Vehicle Fleet*

0.67

*Based on Tesla vehicle data and NHTSA vehicle data.

Safety Score Incentivizes Safe Driving

Customers who choose to be part of our Tesla Insurance program receive a Safety Score^{Beta}. Instead of determining a driver's insurance premium from demographic information (gender, age, education, or marital status) and financial history (credit score), our algorithm calculates Safety Score^{Beta} based on actual driving behavior. Our data shows a lower rate of collision for the cohort of customers who have enabled Safety Score^{Beta}. As the vehicle's Safety Score^{Beta} increases, the number of collisions per mile decreases and insurance premiums reduce. The behaviors we monitor include:

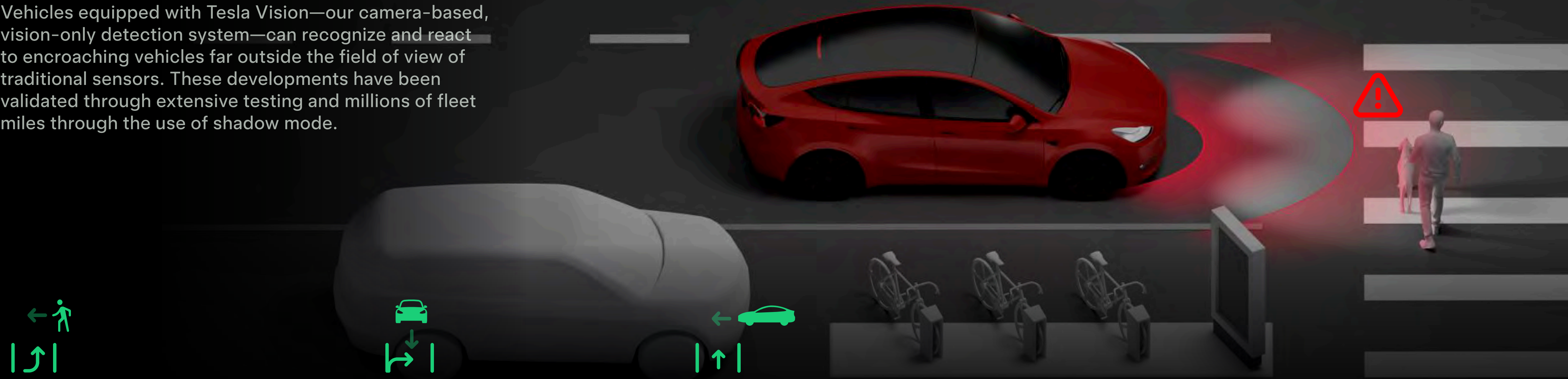
- Forward Collision Warnings
 - Hard Braking
 - Aggressive Turning
 - Unsafe Following (Tailgating)
- Forced Autopilot Disengagement
 - Late-Night Driving
 - Excessive Speeding
 - Unbuckled Driving

Safer Driving, Higher Safety Scores, Fewer Collisions



Automatic Emergency Braking Continues to Improve

Vehicles equipped with Tesla Vision—our camera-based, vision-only detection system—can recognize and react to encroaching vehicles far outside the field of view of traditional sensors. These developments have been validated through extensive testing and millions of fleet miles through the use of shadow mode.



Turning into the path of a pedestrian crossing the road

Turning into the path of an oncoming vehicle

Traveling toward a vehicle on a perpendicular path

Using New Data to Improve Pre-Crash Safety

We can learn from any crash

Whether simulated or real, we can learn from any crash to help optimize the protection of occupants and reduce the likelihood of injury. This fundamental philosophy is one of the reasons our vehicles perform at industry-leading levels in regulatory and consumer crash tests globally. Because our vehicles are connected to Tesla, we can further leverage this philosophy by deploying new safety capabilities and improvements over-the-air as a software update.

Injury Studies

We leverage our ever-growing data set to help ensure occupants receive the best possible restraints (such as seat belts and airbags) for the impact they are involved in and design innovative restraint systems. Our safety analysis engineers evaluate simulation studies to enhance our understanding of the complex impacts that occur in the field. The pace with which we can conduct these studies has accelerated by automating our data pipelines and leveraging machine learning to analyze large data sets. As the capability of driver assistance advances, the nature of the crash exposure to our fleet will change.

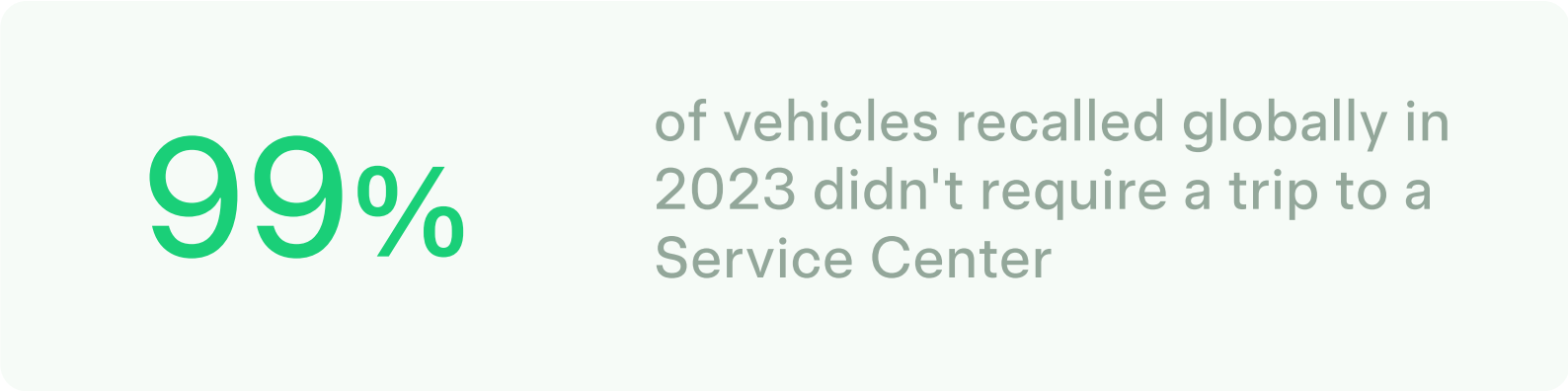
Moving to Tesla Vision increases performance

In 2021, we removed radar from our sensor suite. This improved safety while simultaneously simplifying engineering by removing a noisy signal. Model 3 scored better in both pedestrian (including nighttime tests) and urban crash avoidance scenarios under the Euro NCAP protocols with Tesla Vision only.

Over-The-Air Software Updates Allow for Low-Touch Continuous Improvement

Tesla pioneered the concept of vehicles that improve and become more capable over time by ensuring that every Tesla vehicle made since 2012 can accept over-the-air software updates. These updates have introduced new features and functionality that have made our vehicles smarter, safer and more enjoyable to drive. We have also used the over-the-air system to ensure that our vehicles are not only as secure as possible when they are delivered, but that they continue to stay as secure as possible throughout their lifetime.

Furthermore, 99% of “recalls” of Tesla vehicles in 2023 were handled via over-the-air software updates—allowing our customers to skip a visit to our Service Centers, maximizing convenience and saving time.



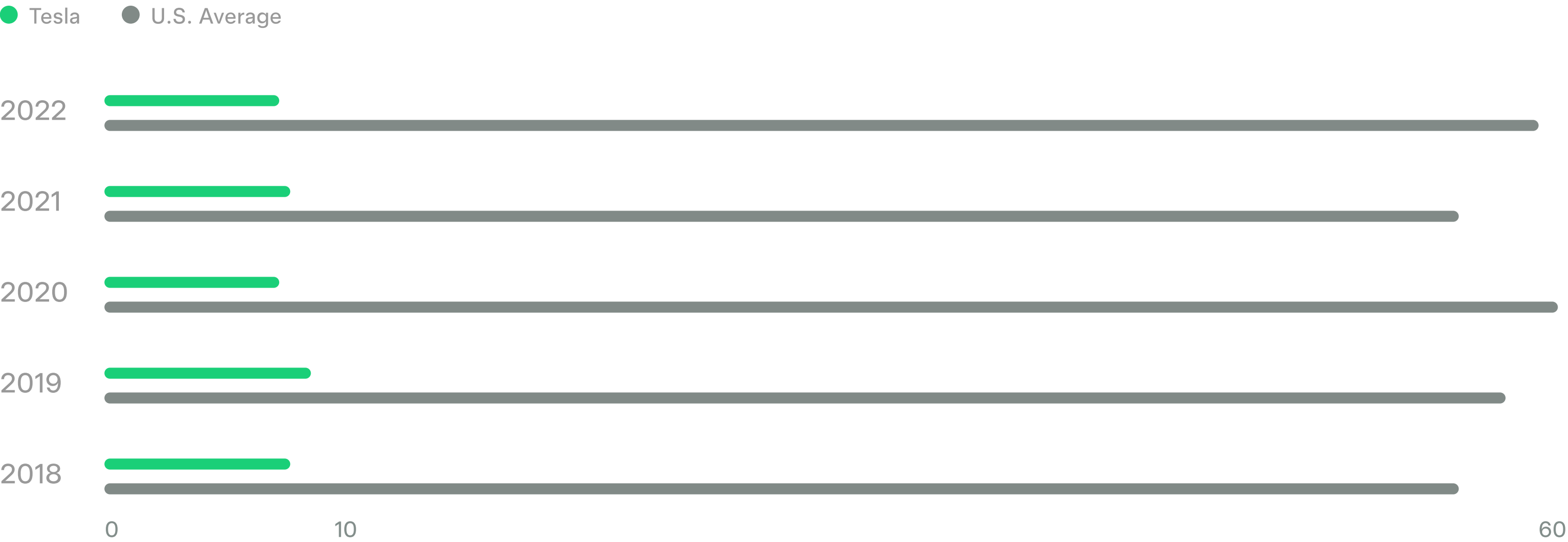
Leading the Industry in Fire Safety

We have always designed our batteries in a way that minimizes the chance of thermal runaway. Our battery packs are industry leading because they are designed to stop a cell runaway event from spreading to a fire. This is one of the many reasons why our rate of vehicle fires is about ten times less likely than an average vehicle. To support a safe transition to sustainable energy, we share safety techniques with the industry.

We publish updated fire safety statistics in our Vehicle Safety Report as they become available. As we rely on non-digital information for some of these cases, there can be a delay between when an incident occurs, when we are notified and when it is included in our statistics. We have developed new and improved methods of identifying and reporting incidents, which will be reflected starting with our 2022 report.

For more information about our methodology, see our [Vehicle Safety Report](#).

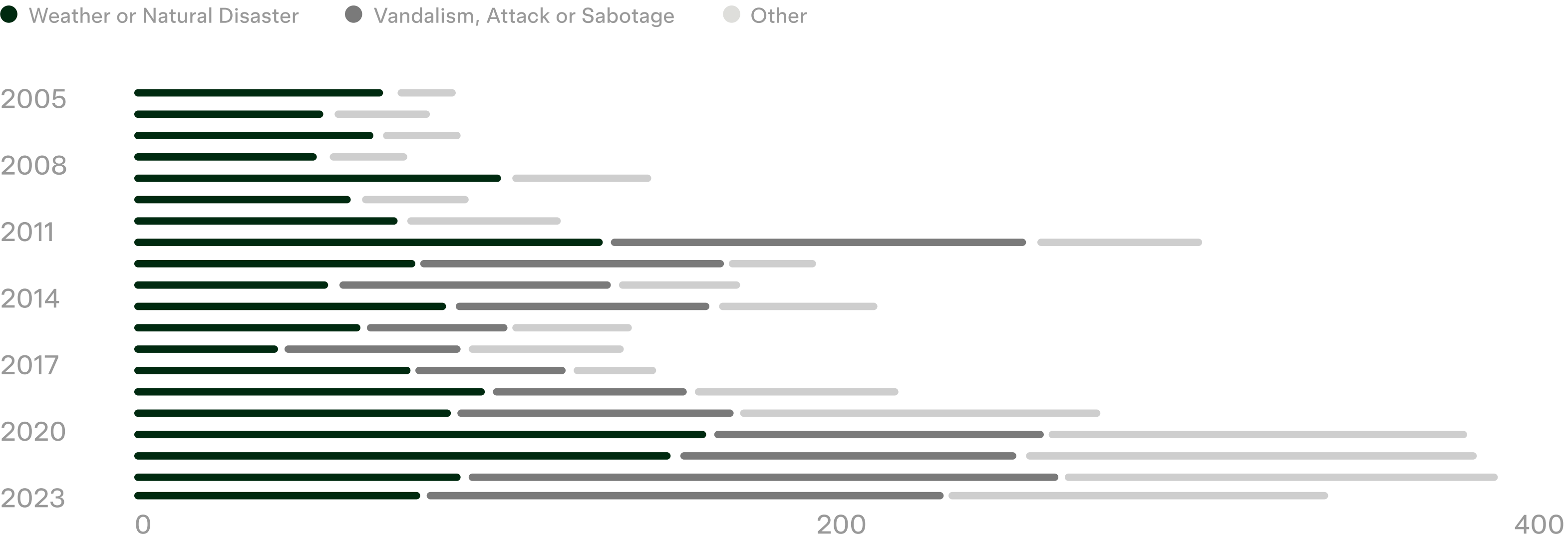
Vehicle Fires Per Billion Miles Traveled In the U.S.



Grid Stability is Required for Decarbonization

As we decarbonize the economy and electrify everything, grid expansion and stability will be more important than ever. Pairing renewables with energy storage is the best way to stabilize and grow the grid while simultaneously making the required GHG emissions reductions needed to avoid the worst outcomes of climate change. Electrical disturbances in the U.S. are becoming more common, predominantly due to weather and natural disasters. According to the U.S. Department of Energy, electrical disturbances cost businesses \$150 billion per year. It is not surprising that homeowners and businesses are increasingly turning to backup power supply options.

Reported Electrical Disturbances
In the U.S.



An Entire Ecosystem

We have an entire ecosystem of energy products including hardware and software across generation and storage. We also have project management capabilities and a strong deployment track record of getting projects done on time. Our energy products can serve many purposes, including reducing emissions, helping to prevent grid outages and acting as backup power if the grid does go down.

Renewable energy paired with battery storage will become the cheapest option available

We are committed to reducing the cost of our products to foster mass adoption. Ultimately, using renewable energy (such as solar and wind) with battery storage will become the cheapest energy option available, regardless of location. This is already the case in many locations around the world. As costs continue to decline, more customers will be able to financially benefit from turning to renewable energy.

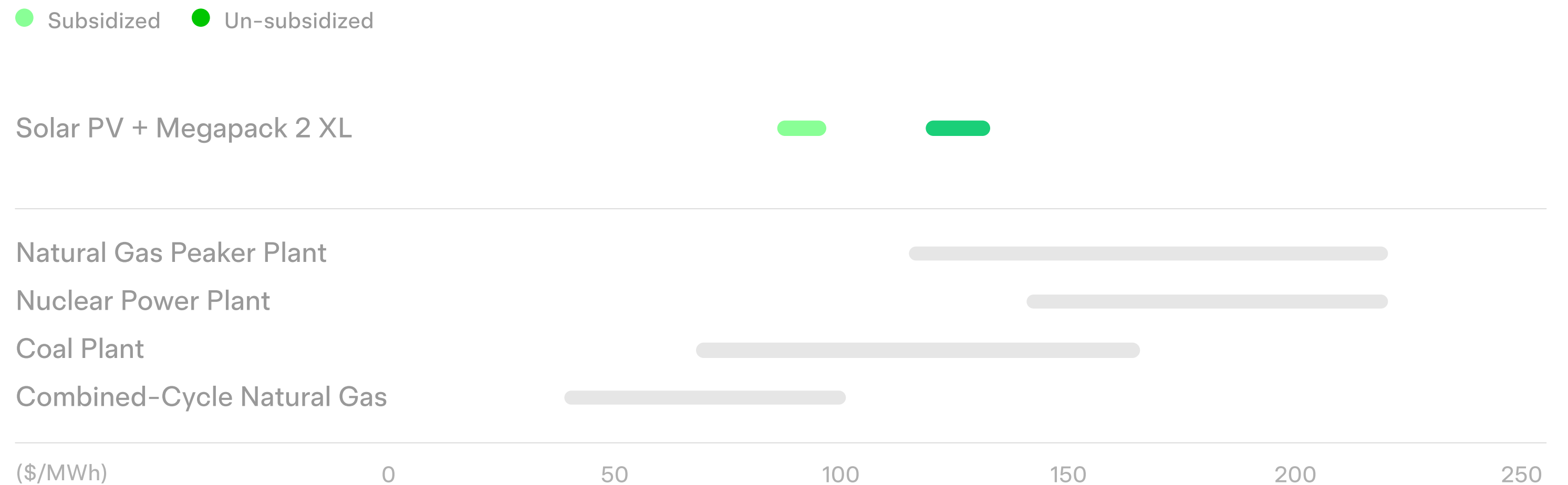


Renewables and Energy Storage Are Already Cost Competitive

Megapack is cheaper per MWh than many fossil fuel alternatives. A single Megapack XL has almost 4 MWh worth of battery storage capacity, and given its scalability, enables projects over 1,000 MWh. In 2022, in order to meet demand that is well in excess of supply for energy storage products, Tesla completed a new production facility, called Megafactory, capable of producing 40,000 MWh of energy storage per year. We also announced another Megafactory in China in early 2023.

The largest energy storage projects deployed in 2023 approached 1,000 MWh in size. Today, Tesla is working with its customers on projects upwards of 3,000 MWh and expects total deployments in 2024 to grow by at least 75% compared to 2023.

Levelized Cost of Energy Comparison for Megapack and Conventional Resources

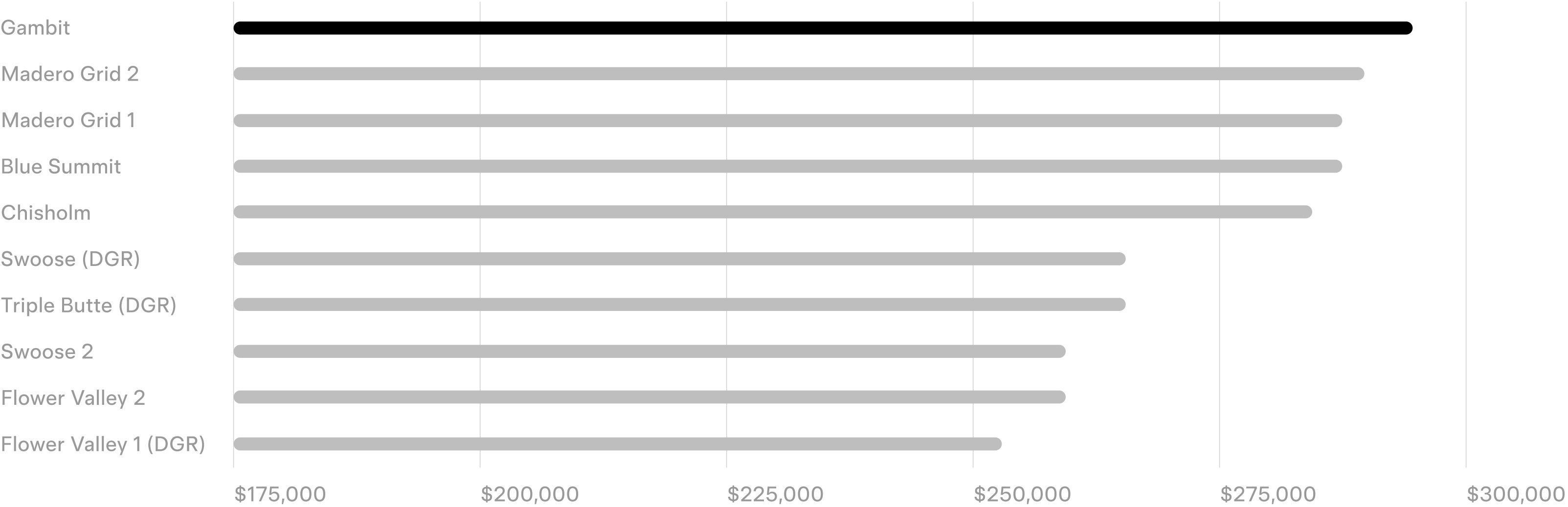


Source: Lazard April 2023 analysis. Megapack 2 XL figures are for our 4-hour duration product and are based on Tesla estimates.

Autobidder Enhances Economic Return for Our Customers

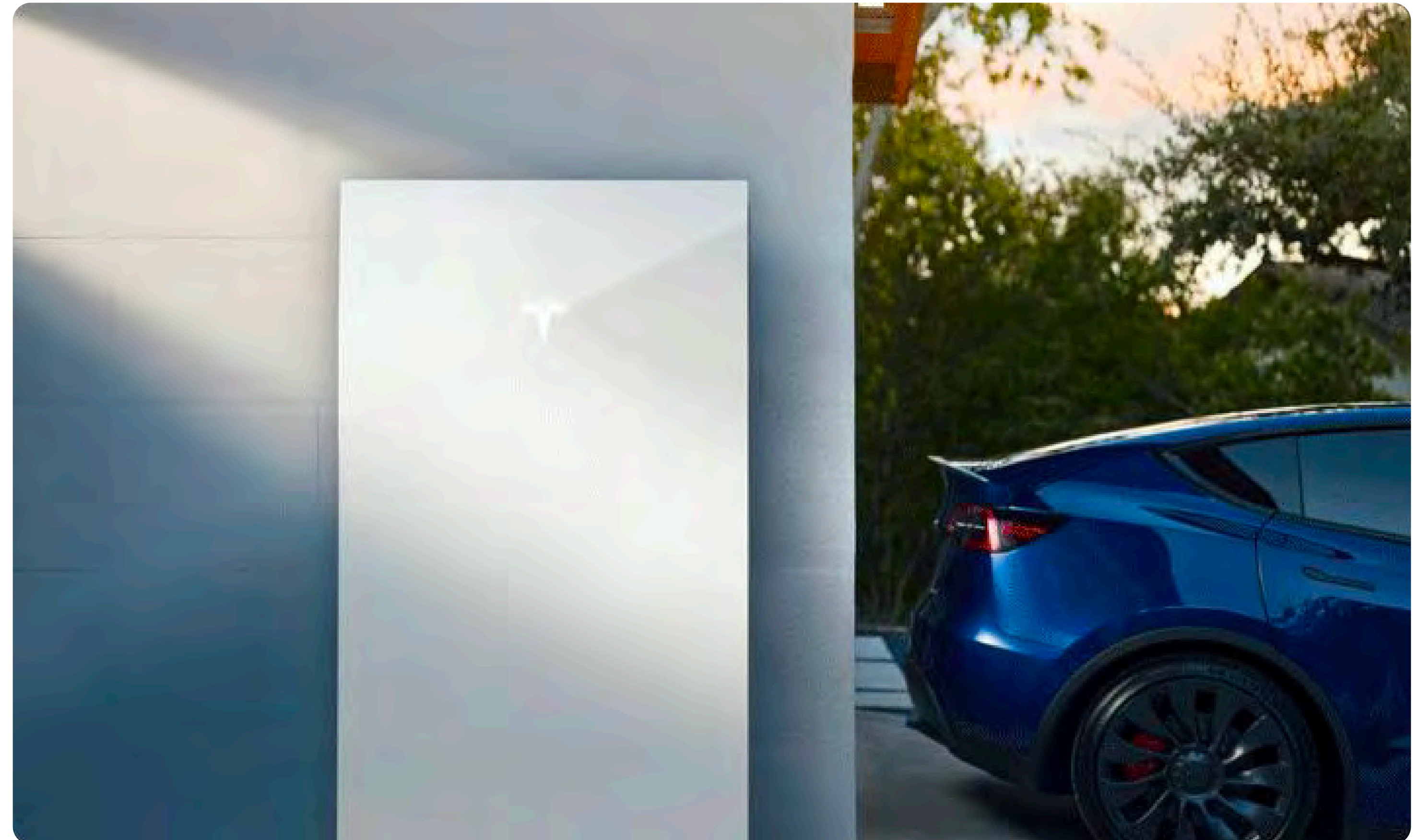
Since launching in 2017, Autobidder—our real-time trading platform for grid-scale battery storage—has generated more than \$350 million in revenue for Tesla and its customers. Autobidder has consistently been named the #1 energy storage optimization software in the markets where we operate. In 2022 and 2023, Autobidder was ranked the top energy storage optimization software in the U.K. by Modo Energy. Gambit was ranked the top performing storage site in Texas in 2022 and 2023 by Modo Energy and Aurora Energy Research. And Hornsdale Power Reserve has been the top-performing energy storage asset in Australia for 6 years in a row.

ERCOT (TX) Energy Storage Projects Annualized Revenues
(Top 10 \$/MW)



Tesla Energy Products Set the Bar for Safety and Reliability

Tesla meets and exceeds many industry safety standards and code requirements, as demonstrated through rigorous testing. The hardware and software safety features in Powerwall and Megapack work in tandem to prevent system faults and maximize product uptime. Continuous monitoring allows for detection, diagnosis and troubleshooting of system warnings and faults—enabling timely and appropriate responses to all safety events involving Tesla products and ensuring the safety of first responders.





Zero Direct Emissions

Unlike fossil fuel peaker plants, battery storage has zero direct emissions



Built-In Safety

Our energy storage products are manufactured with hardware and software safety features



24/7 Monitoring

Early detection, diagnosis and troubleshooting of system errors and Live Support for safety events



Exceeds Standards

Safety is our top priority, and we continuously review, test and update our requirements and procedures



Proactive Fire Control

Designed to prevent battery fires (thermal runaway) and be resilient if they occur



Best-In-Class Performance

Leading energy and power density, upwards of 400 MWh per acre

People & Community

Our Employees Are Critical to Achieving Our Mission

Preparing the Workforce for a Sustainable Energy Future	78
Centering Safety and Engagement	85
Developing Our Leaders Internally	91
Social Impact	101

Preparing the workforce for a sustainable energy future

To sustain our pace of innovation, we must ensure we attract, develop and retain a talented workforce with ample opportunity to contribute to our mission and grow professionally.

We are committed to providing a workplace where our employees feel respected, satisfied and appreciated. Our policies are designed to promote fairness and respect for everyone. We hire, evaluate and promote employees based on their skills and performance.

We Are Focused on Developing the Best Talent

Hiring Events

A core principle of our recruiting strategy is that the best talent doesn't always come from the established recruiting channels. We are focused on attracting and developing diverse talent and supporting their growth into leadership roles, regardless of their background.

Our recruiting efforts focus on providing opportunities for the strongest candidates, regardless of their age, gender identity, sexual orientation, country of origin and other immutable characteristics.

We support organizations and conferences in addition to community engagement and work focused on developing a diverse pipeline of the best candidates.

In 2023, we participated in over 200 recruiting events with universities, the military and other organizations. This helped us cast a wide recruiting net, enabling groups who have not traditionally been included in our hiring pipeline to learn about Tesla and apply for a position.

5.9M

job applications received in 2023

Inspiring the Next Generation of Tesla Leaders

Our education outreach is centered on taking a hands-on approach to inspiring young people through STEM-based programs and events designed to spark curiosity and foster creativity. By providing access to learning opportunities for underrepresented communities, we are preparing even more people for the careers of the future.

Investments in Education

The investments we make in education aims to equip students with the skills and knowledge to be successful in school and at work. By supporting those who live near our factories, we are investing in the long-term health of our communities.

Nevada: In April of 2023, we completed a five-year, \$37.5M investment in K-12 education in the state as part of our commitment to build Gigafactory Nevada. Tesla’s investment has supported thousands of students from all levels in robotics, sustainability and STEM programs. As a result of this investment, over 50% of middle and high schools in Nevada now have an active robotics team.

Texas: At Gigafactory Texas, we continued to support Robotics and Workforce Development programs at Del Valle Independent School District (DVISD) and began work on starting the first Gigafactory Texas High School Robotics lab to support DVISD’s upcoming Pathways in Technology Manufacturing program. In 2023, Tesla invested over \$840,000 to support community organizations across Central Texas.

Inspiring the Next Generation of Tesla Leaders (Cont'd)

Introduce a Girl to Engineering Day

During Engineering Week, Tesla celebrates Introduce a Girl to Engineering Day, a national movement focused on encouraging girls to see engineering as a desirable and impactful career path. Tesla first became involved in 2018 at Gigafactory Nevada and now holds an annual event across many Tesla sites with the goal of creating a fun, engaging learning experience for middle school girls. As a part of the day, students receive a behind-the-scenes tour of a Tesla facility, meet some of the women working at Tesla and participate in hands-on STEM activities with employee volunteers. This year’s event was both in-person and virtual, with over 3,000 registrants across 43 states and 42 countries, hosted at 17 factories, offices and showrooms across the U.S., Canada and Germany.

Manufacturing Day

Tesla celebrates Manufacturing Day each year on the first Friday of October to inspire young people to explore careers in manufacturing. Students and teachers are invited to Tesla factories across North America to learn about our advanced manufacturing. Leaders highlighted Tesla’s mission and students got the chance to experience the Tesla ecosystem through factory tours and interactive trainings. In 2023, events took place at Fremont Factory, Gigafactory Nevada, Gigafactory New York, Gigafactory Texas and Tesla Toronto Automation with over 200 participants from middle and high schools, community colleges and local nonprofits.

Robotics

Tesla’s support for robotics programs serves as a dynamic platform that fosters innovation and equips students with essential STEM skills for the future. Through robotics, students are empowered to work together to explore creative ways to solve problems. Tesla helps support schools through funding, providing Tesla employees as in-classroom volunteers and hosting events. We continue to invest in programs in California, Nevada, New Mexico and Texas. In 2023, Tesla hosted our first Robotics Scrimmage at Fremont Factory for schools from Oakland, California.

Creating Pathways to Career Opportunities in Sustainable Energy

Our workforce development programming is crucial to our success and to bringing in the best talent along the way. It is essential for Tesla to create pathways to cultivate the skills needed for the opportunities in the sustainable energy economy, and we do this through a variety of programs.

START (Manufacturing and Service)

Tesla START is an intensive training program that equips individuals with the skills needed for a successful technician role at Tesla. We partner with colleges nationwide to integrate Tesla START into automotive and manufacturing classroom locations. In 2023, Tesla donated advanced manufacturing equipment and expanded START Manufacturing into new campuses across California, Nevada and the U.K. The first cohort achieved a 100% pass rate and now operate on full-time contracts with Tesla.

Manufacturing Development Program

Our Manufacturing Development Program is designed to provide graduating high school seniors with the financial resources, coursework and experience they need to start a successful manufacturing career at Tesla. We hired 373 graduates through this program in 2023 with a goal of significant growth in 2024 across our Fremont Factory, Gigafactory Nevada, Gigafactory Texas and Gigafactory New York.

Creating Pathways to Career Opportunities in Sustainable Energy (Cont'd)

Technician Trainee Program (Service)

The Tesla Technician Trainee Program provides on-the-job automotive maintenance training at Tesla’s Service Centers. Targeted at individuals already in the industry but with limited experience, the program prepares trainees for employment as entry-level service technicians or for advanced training with Tesla’s START program.

Apprenticeships

In the U.S., the Tesla Apprenticeship is a four-year program combining academic and on-the-job training that prepares specialists in skilled trades. In 2023, we launched additional apprenticeships in partnership with local government at Gigafactory Berlin-Brandenburg with 240 apprenticeships combining theoretical study, applied learning and on-the-job experience. At Gigafactory Shanghai, a program focusing on apprenticeship and educational opportunities engages frontline workers to establish skills and continue their technical knowledge building with a feeder exam and program into Shanghai University of Electricity Power. Between 2022 and 2023, the cohort enrollment grew from 534 to 800 participants. We’ve also rolled out an EV technician training curriculum with partnerships in government and industry associations in Australia, New Zealand, Korea and Hong Kong.

Future Talent Program

Piloted in the U.K. and Ireland, this traineeship pathway is designed for early careers and career changes with a fast track 12-month program to rotate around all Tesla core Sales, Service and Delivery departments with eight-week rotations. Each trainee is supported by a rotational supervisor and a dedicated line manager. During their final eight weeks, trainees select an elective rotation that correlates with the department they would like to pursue as a full-time position upon graduation. Upon completion, we hired 76% of graduates from the first cohort into full-time roles.

Creating Pathways to Career Opportunities in Sustainable Energy (Cont'd)

Internships

Our internship program is an important channel for finding talented individuals who are passionate about sustainable energy. When there is a business need, we hire university and community college students from around the world for internships across the U.S. We provide our interns with the opportunity to engage in meaningful work from day one, with the goal of offering full-time positions when their internship is complete.

Military Fellowship Program

Tesla's Fellowship program, in partnership with the U.S. Chamber of Commerce Foundation's Hire Our Heroes, offers exiting military service members corporate industry experience. The program aims to convert high-performing individuals to full-time roles and create a veteran talent pipeline. In 2023, our Military Transition Program in EMEA consulted with over 1,000 individuals formerly in the service in Germany, U.K., Netherlands and Belgium on potential careers in Tesla.

Employee Education Assistance Program

This year, we launched an Employee Education Assistance Program—providing 70,000 employees in the U.S. with tuition-free or partially funded access to over 400 learning and skills training programs. Focused on providing opportunities to our frontline workforce, it includes virtual, self-paced education options, enabling employees to pursue new qualifications or expand their knowledge while advancing their careers. 80% of eligible employees work on the factory line or in the field.

We Center the Safety and Engagement of Our Employees

The safety and health of our employees is a core value

Everyone across Tesla works to ensure a healthy and safe workplace. We actively engage employees to identify risks before incidents occur and base our programming on three pillars: do the basics right, engage and empower stakeholders and reduce risk. We take a systems-thinking approach and focus on training, collaboration and direct engagements with the people doing the work to build our products.

We want to measure the most critical incidents. While we still report and track OSHA metrics, we’ve continued to utilize the international standard on American Society for Testing and Materials 2920-19 (ASTM) to track and manage safety incidents over time.

Workplace Injuries in 2023
ASTM 2920 Global Standard

2.51
ASTM Rate

368,650,973
Hours

Workplace Injuries in 2022
ASTM 2920 Global Standard

2.86
ASTM Rate

255,950,012
Hours

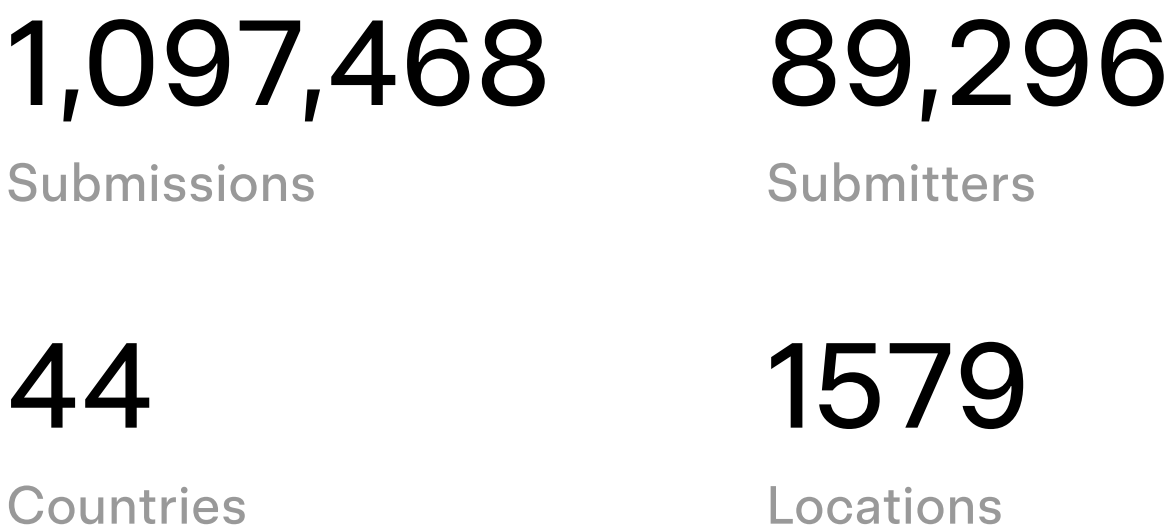
We Listen to Our Employees

We empower our employees to identify improvements. Take Charge—our internal improvement suggestion module—allows employees to submit improvements in environment, health, safety, security, people and more. Promoting a company-wide culture of improvement, Take Charge is used across all departments and regions where Tesla operates. Executive leaders have adopted and been trained in Take Charge. Submissions can be made anonymously and be owned at a cross-functional level.

Take Charge works as a leading indicator for safety and engages those closest to the work—as well as their supervisors—to establish a process to address issues proactively. Since its launch in 2021, we’ve seen a 30% reduction in global injury rate. To ensure integration across our operations, submissions are categorized into Safety, People, Accuracy, Rates and Cost (SPARC):

91% of our employees agreed they knew how to report safety and security events

Take Charge
Submissions (January 2021-January 2024)



Take Charge
Breakdown of Submissions by Category



We Empower Our Employees to Build the Safest Operations

We actively engage employees to identify risks before incidents occur and base our programming on three pillars: do the basics right, engage and empower stakeholders and reduce risk. As we’ve increased employee engagement, we’ve seen our work-related injury rate come down over the same period.



Safety Improvement Suggestions by Employees Are Increasing

2021

49,000

2022

333,000

2023

660,000

Industry Avg.

*The data is taken from companies participating ORCHSE/NSC for 2022



While Our Global Work-Related Injury Rate Is Decreasing (ASTM)

3.57

2.86

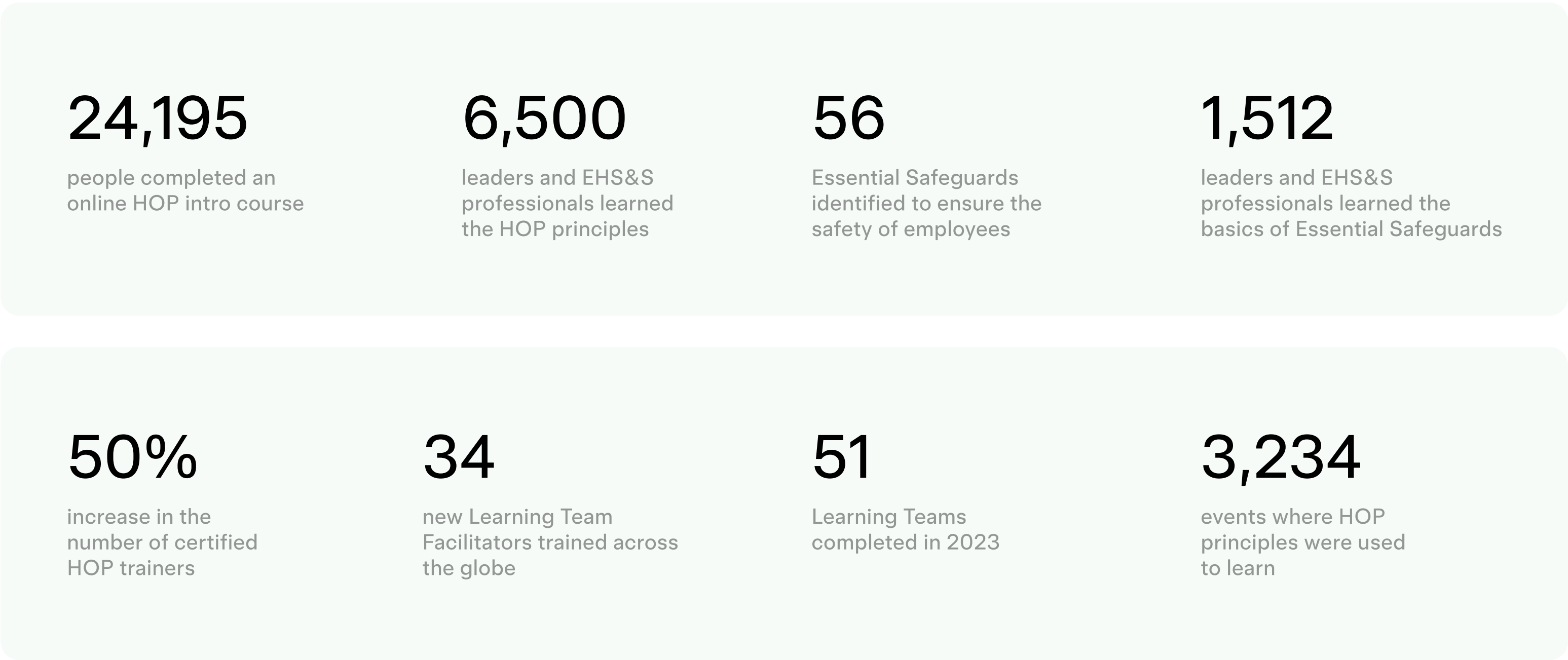
2.51

6.96*

Human and Organizational Performance (HOP) Principles Shape Our Safety Journey

The HOP mission is to accelerate progress through operational learning, increased capacity and systems thinking. HOP enables Tesla to learn quickly and develop robust systems that can tolerate errors and fail safely. It prioritizes making it easy for workers to do the right thing. We develop tools and programs to integrate HOP principles into daily work.

In 2023, we rolled out the Essential Safeguards program, a focused effort on fatality and serious injury prevention by strengthening our preventative and mitigative safeguards.



The Safety of Our Contractors is as Important as Our Own Employees

Our safety focus is not only for our employees but also for those we contract with. To enhance visibility and management of production operations with contractors, we’ve deployed a global contractor onboarding and management system called Workforce Management. This enables coordination of work, identification of critical impacts, assessments of risk and communication of essential safeguards to elevate the environmental, safety and health performance of our onsite contractors and suppliers. We’ve integrated the core HOP principles along with access to event reporting tools including Take Charge.

We also developed a field verification inspection tool and conduct regular inspections to confirm Pre-Work Risk Assessments (PWRA) and Pre-Task Plans (PTP), mobile equipment inspections and permits are completed prior to each shift. In 2023, over 9,000 field verifications were completed. We will continue to integrate this work throughout our global factories and customize tools to fit the needs of our Sales, Service and Delivery (SSD) and Energy business channels.



We Track Employee Sentiment Annually

In 2023, we continued to gather employee sentiment around work, culture, the leadership team, job satisfaction and career growth opportunities through our Employee Engagement Survey. In the company-wide engagement feedback, over 80% of respondents agreed or strongly agreed that they are overall satisfied with working at Tesla, there are clear pathways for growth with feedback from management, they feel respected and accepted by their team, they feel safe at work and know how to report incidents, they are supported by their manager, are satisfied with benefits at Tesla and they know how to raise HR/People-related concerns.

We develop our leaders and their team management skills throughout their time at Tesla by offering specific leadership training, enhancing our performance management tools and continuing to broaden employee recognition. This helps us drive a culture of accountability, collaboration and continuous improvement, which is essential for organizational growth. Our teams are better as a result, and over 80% of employees strongly agreed or agreed that their manager helps their team succeed.



We Continue to Invest in Our Leaders' Development

Leadership: Growth and Development Training

We launched an Upward Feedback program to engage leadership across the company as part of performance management and gauging employee sentiment. Our programmatic approach to leadership development includes a robust training series from new leader onboarding fundamentals to continued learning, which focuses on:

- Leadership essentials
- Driving development
- Emotional intelligence
- Growth mindset
- Communication that counts
- Feedback
- Leading through transitions
- Leading peers
- Servant leadership
- Working with cross-functional teams
- Coaching
- Recognition
- Interviewing with intention

Performance Management

Tesla's comprehensive performance management framework is designed to enhance performance evaluation, formal feedback, goal setting and support mechanisms. It encompasses crucial components such as personal and professional goal setting, ongoing coaching, performance evaluation and a bi-annual review conversations. These elements align employee development with organizational objectives, resulting in heightened performance and overall success. In 2023, Tesla saw:

- 1.5x increase in documented coaching
- 100% completion rate for bi-annual evaluation cycles
- 30,000+ goals developed between employees and their manager, with 96% meeting their goals

Engagement: Shout Outs

Recognizing exceptional work is important. We've continued to see tremendous growth in utilization of our Shout Outs tool, with usage up 138% in 2023. This enables employees to recognize the achievements, contributions or impact of their colleagues. Bringing this visibility to excellent work gives direct feedback to employees and their managers and enables leaders to see the impact their teams are having. As part of this program, we also highlight engagement in key programs such as safety improvements or vehicle delivery volunteering and track career milestones.

We Investigate Concerns and Complaints

An employee can raise concerns or complaints to any member of management, Human Resources (HR) or Employee Relations (ER). If they prefer to report another way, the Integrity Line is available 24 hours a day, seven days a week and allows employees to report concerns anonymously and without fear of retaliation. Concerns are investigated promptly and impartially in a manner appropriate to the circumstances. The ER team engages in feedback loops with leaders and HR to provide guidance on any appropriate follow-up actions, which range from additional communication and training to corrective action and discipline up to termination of employment.

In 2023, when asked through our company-wide Employee Engagement Survey, 81% of employees strongly agreed or agreed they know where to raise HR/People related concerns or suggestions so that they can be reviewed and addressed.

Types of Concerns and Complaints

64%

Human Resources / Employee Relations

3%

Environmental, Health and Safety

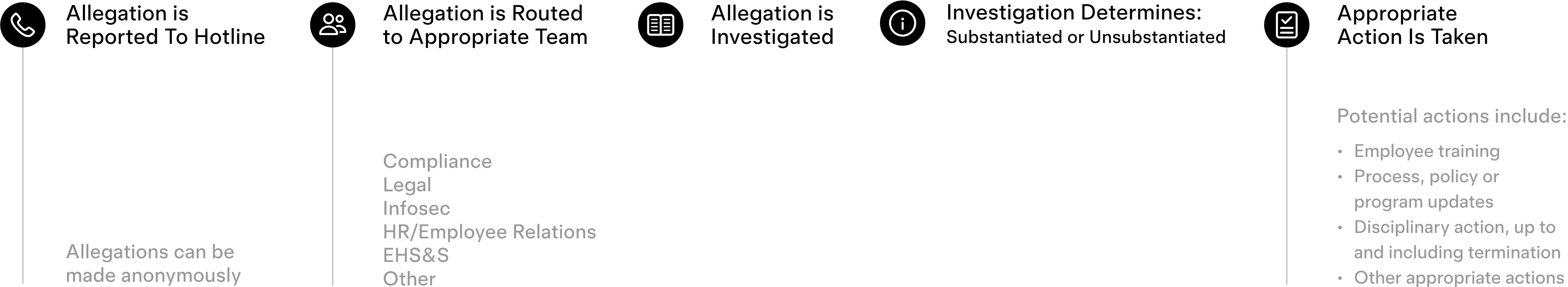
31%

Business Integrity

2%

Misuse of Corporate Assets

Process for Investigating Allegations Received Through Integrity Line



We Do Not Tolerate Harassment or Discrimination

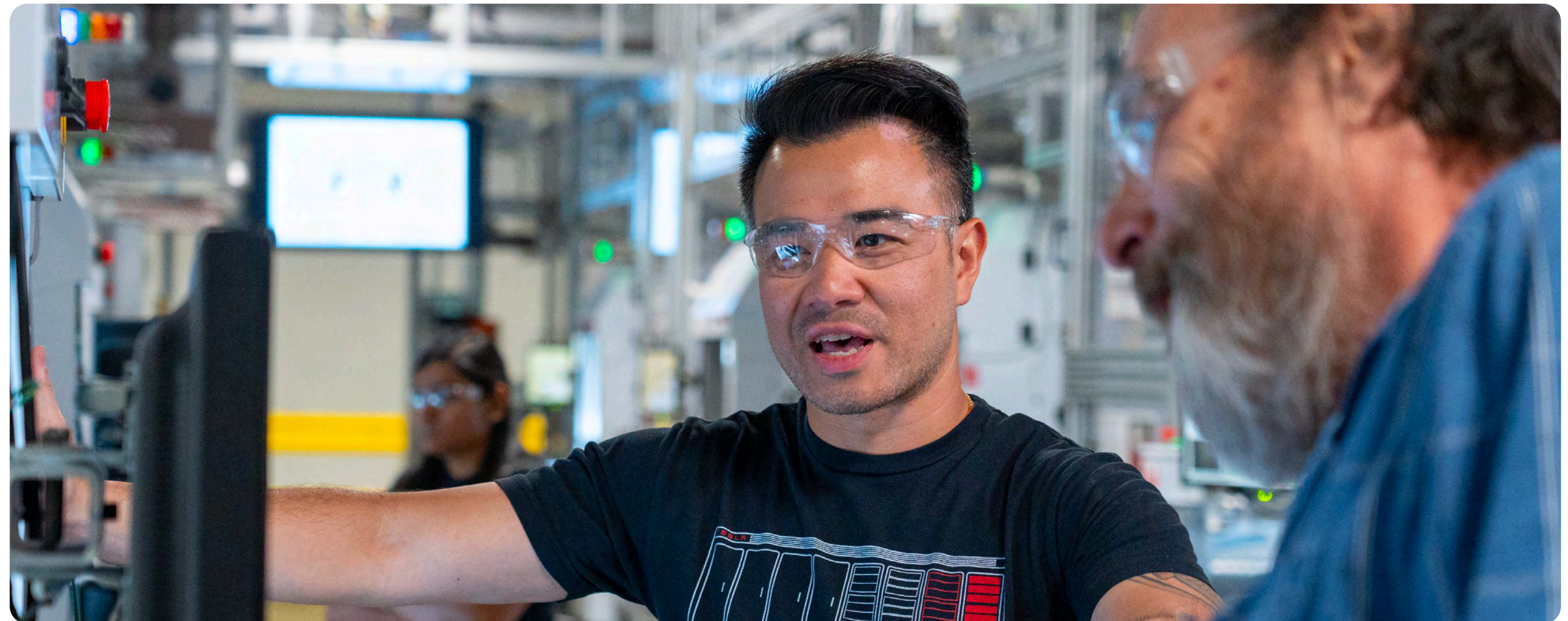
Nearly 100% of Tesla employees completed COBE training in 2023

Our policies are designed to promote fairness and respect for everyone. We hire, evaluate and promote employees based on their skills and performance. As we grow, we continue to address challenges head on. From day one in New Hire Orientation, employees learn about Tesla's respectful workplace. As part of prevention, we set clear expectations with annual Code of Business Ethics and Anti-Harassment (COBE) trainings globally. These trainings are not only included during the onboarding process, but throughout duration of employment with Tesla. Management regularly checks completion rates and follows up to ensure each employee completes all required trainings. In 2023, 97% of Tesla employees completed COBE training.



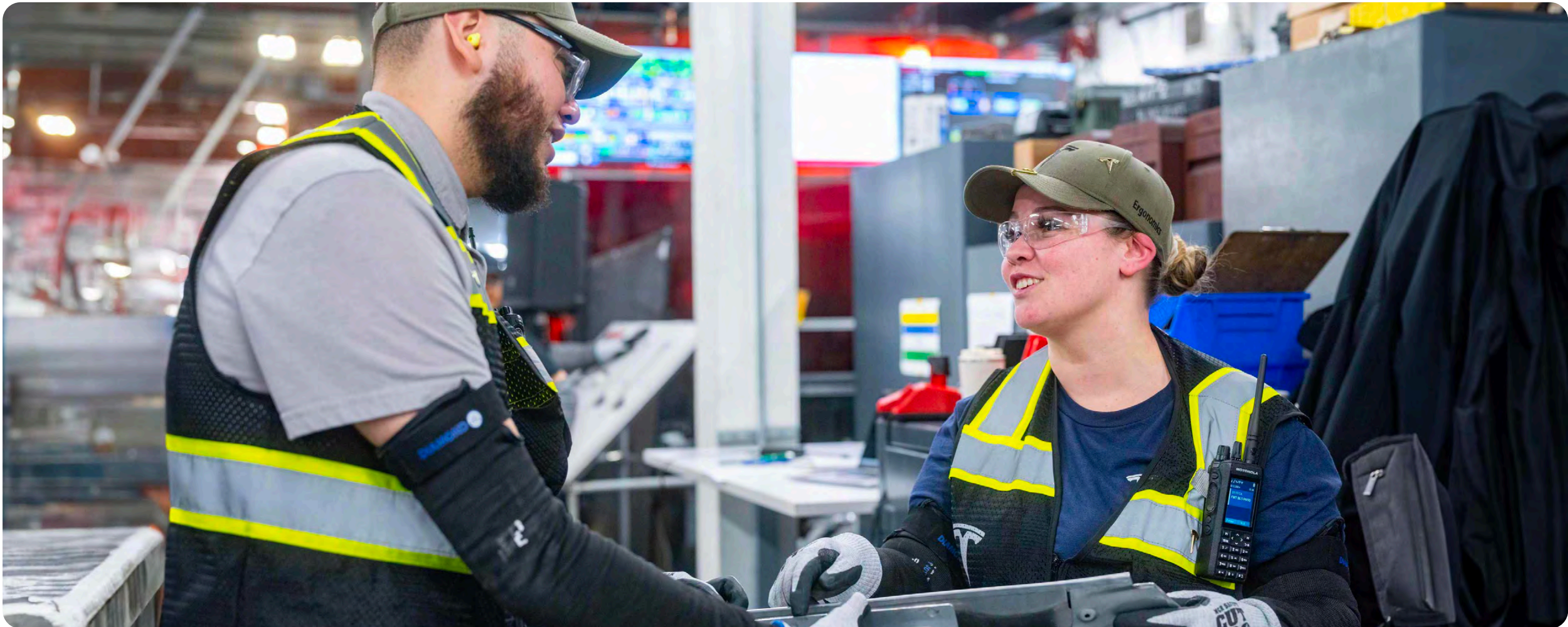
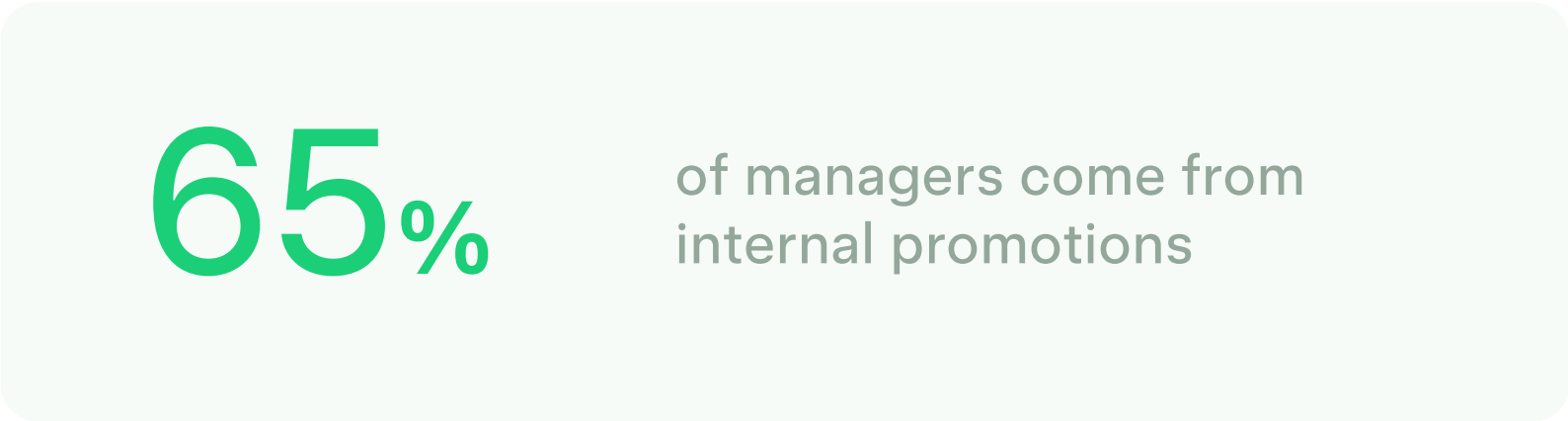
Innovation Through Constructive Conflict

At Tesla, our employees are passionate about making a difference in the world and for each other. We remain unwavering in our demand that our factories, offices, sales locations and Service Centers are places where our employees feel respected and appreciated. Everyone is expected to be trustworthy, demonstrate excellence in their performance and collaborate with others. Innovation and excellence go hand in hand, and we've created psychologically safe environments where people are comfortable with raising new ideas in constructive conflict. In 2023, 91% of employees agreed that we treat each other with respect, even when we have different points of view.



Nearly Two-Thirds of Our People Leaders Come From Internal Promotions

We offer internal career development to our employees and the ability to make a meaningful contribution to a sustainable future. As of the end of 2023, 65% of our managers were promoted from an internal, non-manager position and the average tenure of senior management was over nine years.



Our Programs Support Employee Wellbeing Holistically

Our health programs promote employee wellbeing by offering no-cost paycheck contributions for medical, dental and vision plan options for employees and family members—plus employer-paid life insurance, short- and long-term disability, confidential counseling for employees and their families, employee assistance programs and voluntary benefit programs. Employees can also access student loan and debt consolidation services, transportation subsidies and \$0 cost shuttles, backup childcare, discount programs and tools and resources to support growing families. We have student loan refinancing options, 401(k) contribution matching and a benefits concierge service for LGBTQ+ employees.



We Offer Competitive Pay and Benefits

We continue to attract the best and brightest with our competitive pay and benefits package. We offer employees the opportunity to receive equity during their employment and share in the success of Tesla. Shared ownership of the company is one of the most essential attributes of working at Tesla.



SafetyNet

Limited financial assistance for employees experiencing temporary hardship



Back-Up Care

Five days of back-up daycare, tutoring and distance learning assistance



Employee Perks

Preferred pricing on gym memberships, financial services, childcare and travel as well as savings on Tesla products



Rethink

Resources at no cost to tools and resources for families including those with developmental and learning challenges



16 Weeks of Paid Family Leave

Employees spending time with their family after the birth or adoption of a child



Family Services

Including fertility services, adoption and third-party reproduction services

Employee Stock Purchase Plan (ESPP)

Our employees can purchase Tesla stock at a discount through the ESPP. Enrollment in ESPP is easy with an internal site, stock admin team and support through the administrator. In 2023, we increased efforts around education for how to use this benefit. We want to ensure increased financial health and literacy is something everyone at Tesla can benefit from regardless of role or seniority.



Our Pay Equity Program

Our program is designed to assess whether similarly situated employees are paid in a similar manner after accounting for variables such as:

- Geographic Zone
- Tenure
- Average Performance Score
- Job Function
- Management Level and Role

HR also offers a Pay Equity and Pay Transparency educational course to everyone in the People Organization, with a focus on HR partners and recruiters. This course details what pay equity is, why it is important, how unconscious bias affects pay and hiring, best practices for hiring and compensation and how each person can be an effective partner in helping the company achieve and maintain pay equity.

Community Engagement

Supporting the Communities We Work In

We are committed to positively impacting and strengthening the communities in which we live and work. We have created programs and partnerships in the regions where we operate to ensure communities benefit from our presence. Through our sustainability initiatives, we strive to support the natural environment by harnessing the power of our people, products and programs.

Tesla Impact

Since launching in 2020, participation in our employee volunteer program has more than doubled. In 2023, we implemented a user-friendly volunteer and giving platform, facilitating easy volunteer sign-ups, donations and engagement in major initiatives like Earth Day, Week of Service and Season for Giving, as well as various one-off volunteer events on-site or in our communities. Tesla volunteers continue to make a significant impact through their dedicated efforts.

- Nearly 1,800 employees volunteered or donated
- Over 8,000 volunteer hours
- Over 100 non-profits impacted

EV Charging and Energy Donations

The goal of our EV Charging donations program is to increase access to charging and remove barriers to EV adoption by building infrastructure in communities with little-to-no access to charging. We do this by partnering with community-based organizations and donating Tesla Level 2 Wall Connectors to be installed in publicly accessible areas.

In 2023, we launched a Solar and Energy Storage donation program to help support energy resiliency in communities most impacted by climate change.

Disaster Relief

We’ve been able to help communities around the world to restore power during crises by deploying Mobile Powerwall Units (MPUs):

Maui ●

In Maui, Tesla supported wildfire relief efforts with two direct zero-cost loans of MPUs. We also provided technical support to NGO partners and Certified Installers for the rapid build and deployments to relief camps.

Puerto Rico ●

Tesla pre-positioned five MPUs with a partner organization for crucial fire stations that support operations for most of the year. We also provided engineering support for custom mobile Powerwall trailer designs.

Mississippi ●

Tesla deployed two MPUs after a tornado in Mississippi to support disaster relief efforts at a central health clinic.

Florida ●

After Hurricane Ida, Tesla deployed an MPU to power a relief center.

Australia ●

Tesla deployed two MPUs to community centers in New South Wales after loss of power that resulted from unprecedented flooding.

Supply Chain

Accelerating Sustainability Through Our Sourcing

Supply Chain Decarbonization	107
Battery Recycling	110
Responsible Sourcing of Battery Materials	113
Responsible Sourcing of Other Priority Materials	127
Tools	131

EV supply chains present more opportunities for positive impact than ICE vehicle supply chains

EVs have clear benefits during the use-phase; however, some critics say they rely disproportionately on raw material extraction and as a result have a higher environmental impact up front. In reality, the unique raw materials, manufacturing processes and structure of our supply chain aims to maximize positive environmental and social impact.



ICE Supply Chain

Typically lacks control and transparency in the upstream supply chain
Typically relies on secondary GHG data estimates
Relies on single-use fossil fuels
Typically focuses on manufacturing
Needs more raw material extraction than a sustainable energy economy



Tesla EV Supply Chain

<p>We leverage our market power to make mining and refining better</p> <p>We source the critical minerals needed for our products directly from mines, refiners and smelters. This allows for increased leverage to make mining and processing a better, less GHG-intensive industry with greater traceability. In 2023, we completed more audits in this part of the supply chain than ever before. We made improvements in GHG emissions, water and air quality, mine closure, mine waste, biodiversity and community and civil society engagement, including in Indonesia and the Democratic Republic of Congo.</p>
<p>We are set up for supplier-specific decarbonization</p> <p>Bolstered by our direct relationships with suppliers far up the supply chain, in 2023, we collected more primary and precise GHG data from suppliers in prior years, setting the stage for supplier-specific decarbonization.</p>
<p>We optimize the recyclability of battery inputs</p> <p>EV battery inputs are highly recyclable. In 2023, at our in-house recycling facilities, Tesla processed enough recovered material for 9,000+ Model Y RWD vehicles. This will continue to massively scale as batteries begin to return to us in meaningful quantities over the next decade.</p>
<p>We innovate through vertical integration</p> <p>Our vertical integration enables new innovations that are better for people and the planet. For example, at our lithium refinery in Texas, we replaced toxic materials with a reusable compound.</p>
<p>We'll need less mining for a fully sustainable energy future</p> <p>As demonstrated in Tesla's Master Plan Part 3, a fully sustainable energy future, including producing the number of EVs needed for it, will require less mining than one based on fossil fuels. Fossil fuels currently account for 15.5Gt of material extracted from the earth each year.* In a sustainable energy economy, material extraction will decrease by 10.8Gt—with most fossil fuel extraction being replaced by 3.3Gt of renewable material extraction. Over time, this will further decrease as recycling becomes more prevalent.</p> <p><small>*Based on data from the Circularity Gap Report</small></p>

Priority Engagement Areas and Materials

Our efforts are guided by our commitments and the supplier expectations included in our [Responsible Sourcing Policy](#), [Global Human Rights Policy](#), [Supplier Code of Conduct](#) and international frameworks like the [OECD Guidelines for Multinational Enterprises](#), [OECD Due Diligence Guidance for Responsible Business Conduct](#), [OECD Due Diligence Guidance for Responsible Minerals](#), the [Universal Declaration of Human Rights](#) and the [United Nations Guiding Principles on Business and Human Rights](#).

Additional information on our responsible sourcing efforts can be found in our [Modern Slavery Statement](#) and [Conflict Minerals Report](#).

We identified several priority raw materials and engagement areas for our responsible sourcing efforts using business criteria (demand, criticality) and potential adverse impacts:

Priority Engagement Areas

- Combatting forced labor
- Decarbonization
- Improving water quality
- Preventing child labor
- Protecting forests and biodiversity
- Protecting human rights

Priority Raw Materials

Lithium, Nickel, Cobalt

Batteries, particularly in the cathode

Aluminum

Body structure, chassis, some components of the battery system



Tin, Tantalum, Tungsten, and Gold (3TG)

Various electronic components within the vehicle, such as sensors, circuitry and connectors.

Ferrous Metals (Steel & Iron)

Frame, body panels and motor casings.

More Primary Data Than Ever to Inform Supply Chain Decarbonization

We're working to accelerate the world's transition to sustainable energy not only through our products and operations, but also through our supply chain. To get there, we need accurate emissions data.

Historically, emissions have been underestimated due to limited data and generalized methodologies. That's why we prioritize gathering high-quality and primary data directly from our suppliers.

See page 147 for a full disclosure of our Scope 3 GHG emissions, including supply chain.

In 2023:

345

GHG datapoints were collected directly from our suppliers through our GHG survey or LCAs disclosed by suppliers



We used a process-based model for steel and aluminum for the first time

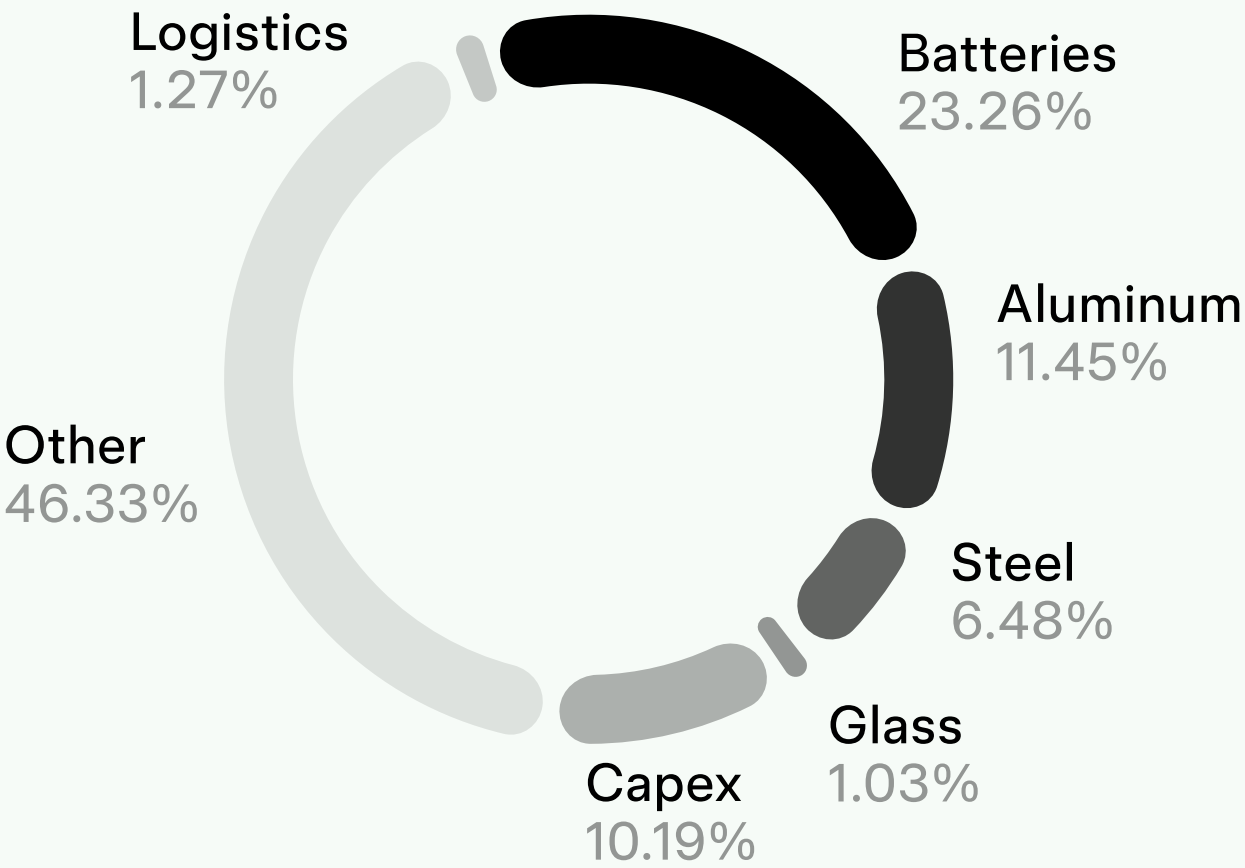


We moved to more regionally representative numbers



We collected significantly more primary data for the battery calculations

Tesla Commodity Supply Chain Emissions



In the Battery Supply Chain: Reducing Emissions Through Supplier Engagement

In 2021 and 2022, we were the first downstream company to disclose an analysis of carbon emissions hotspots methodology in our battery supply chain using LCA methodology. This enables us to address critical areas within our supply chain more effectively.

Tesla requests all suppliers in the battery supply chain to provide annual GHG emissions footprints, either through our GHG Survey, an ISO-certified facility footprint or an ISO-certified and third-party reviewed LCA. We also provided supplier-facing guidelines for Life Cycle Inventory Analysis (LCIA). In 2023, we also began requiring suppliers to provide GHG reduction plans and progress updates, with science-aligned reduction targets set at the cell, cathode, and refining/smelting levels.

In addition to getting primary data from suppliers, we create process-specific estimates of remaining emissions data. These were identified as hotspots through prior analyses.

In 2024, Tesla will work closely with suppliers to develop GHG reduction targets and roadmaps.

Based on the supplier data we will continue to collect, we aim to work with suppliers to develop site-specific decarbonization plans, while designing and sourcing for low-impact cells and increasing the share of recycled material. This will be guided by an overall reduction target for the battery supply chain as well as science-aligned targets set by suppliers.

In 2023:

35

suppliers disclosed facility GHG data

18

suppliers disclosed product LCAs

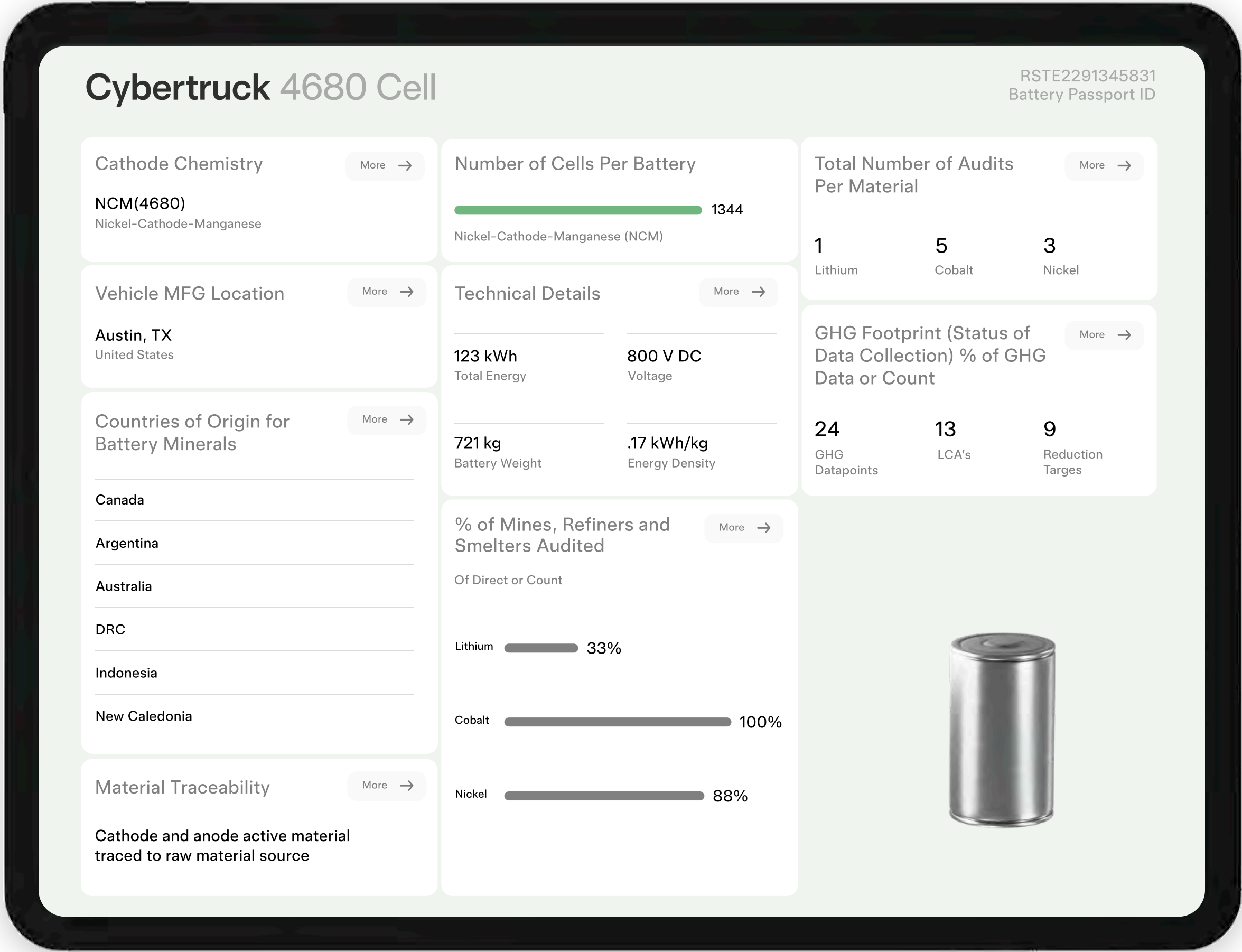
9

suppliers set science-aligned GHG reduction targets

Building on the World's First Battery Passport

In 2022, Tesla was one of two EV producers to publish the world’s first battery passport. This pilot leveraged blockchain technology to enable digital traceability of shipments of cobalt and collected GHG emissions and human rights data from mine to our Gigafactory in Shanghai.

In 2023, we leveraged the lessons learned from this pilot and continued to work toward a scalable Battery Passport to help Tesla owners understand the carbon footprint and supply chain sustainability of their vehicles.



We Optimize the Recyclability of Battery Materials In-House

While ICE vehicles rely on single-use fossil fuels, recovered battery inputs like nickel, cobalt, copper and lithium can be reused for new products. As a leading global manufacturer of EVs and energy products, we are well positioned to safely recover our products and efficiently reclaim battery metals to replace a substantial share of primary mined materials in our batteries with recycled content.

We recycle battery materials using the methods described on the right.



Collection

We typically only know that our products are no longer operational if a customer alerts us. To enhance our collection of end-of-life products for recycling, we expanded the Tesla Operating System to include recovery of end-of-life vehicles and battery packs and continued to track 100% of manufacturing scrap generated at each of our production facilities.

Processing

We continued to invest in and scale our efforts to process recovered materials at Gigafactory Nevada, and our remanufacturing facilities in California and at Gigafactory New York. In addition, we also provide material to third-party recyclers.

Reincorporation

Once the battery materials have been extracted from end-of-life products and refined into battery-quality raw materials, we then reincorporate them into new products.

Battery Recycling: 2023 Key Achievements

2023 Grand Total Recovered (mt)



For more information about our operational decarbonization strategy, see pages 36-45 and 50.

Battery Recycling: Key 2023 Achievements

>90%

of materials recovered from returned or end-of-life products and manufacturing scrap are recycled

500+MT

per month battery recycling throughput at Gigafactory Nevada in Q4

650MWh

of battery materials processed at our battery shredding facility, which is enough for 9,000+ Model Y RWD vehicles

3GWh

of battery materials sent to our recycling partners, which is enough for 43,000+ Model Y RWD vehicles



Wet shredded cell material at Tesla's Gigafactory Nevada

Combatting Forced Labor in Our Supply Chain

Forced labor is a complex issue that affects supply chains in all industries and regions and requires both global and targeted local responses. In 2023, we committed more human and legal resources to combat forced labor risk in our supply chain. Our efforts are informed by International Labor Organization (ILO) guidance, including principles to cease harm and provide remedy, and regulatory frameworks relevant to our global operations.

Our Process:

- ① Require suppliers to acknowledge our Supplier Code of Conduct at onboarding, which includes forced labor provisions, and make commitments to avoid forced labor in supplier contracts
- ② Prioritize mapping high-risk supply chains to raw materials

- ③ Screen our partners using a combination of resources, including reputable third-party tools and experts, including legal advisors
- ④ Conduct audits that assess the following indicators:
 - Supplier sites where working hours exceed the 60-hour weekly threshold
 - Share of foreign migrant workers
 - Supplier sites with dispatch/contract workers
 - Worker accommodation
 - Use of third-party labor agencies
 - Evidence of working hours document falsification, passport withholding, withheld wages, recruitment fees and inhumane treatment
- ⑤ Incorporation of NGO and other stakeholder reports (including feedback) to assess risk and inform business decisions

- ⑥ Where violations are identified, work with suppliers to review root causes, approve plans to improve and remediate issues and monitor evidence of improvement and worker engagement. We may pause sourcing from a supplier until identified issues are remediated or transition away from a relationship when a violation is not resolved

Combatting Forced Labor in Our Supply Chain: 2023 Key Achievements

.

13,018

suppliers screened using industry leading third-party tools

5,400

workers reimbursed over \$150,000 after we identified instances where workers were charged recruitment or other fees for employment

- 984 supplier facilities surveyed on ILO forced labor indicators through Tesla’s Self-Assessment Questionnaire
- 156 suppliers completed audits (covering indicators listed on prior page), including 3,645 worker interviews
- 96% of audited suppliers demonstrate effective grievance mechanisms with the remainder working on corrective actions
- Launched ability to restrict purchasing on our supply chain management portal if potential risks are identified and not mitigated
- Over 1,000 staff covered in monthly trainings for entire procurement team on how to identify potential forced labor risks when visiting suppliers and a December Human Rights Day training—honoring the 75th anniversary of the Universal Declaration of Human Rights—on how Tesla’s mission is linked to human rights in the supply chain. Requested suppliers to complete similar trainings for their staff

Combatting Forced Labor in Our Supply Chain: 2023 Case Studies

Tesla actively combats forced labor in our supply chain to address risks and remedy any potential harm. The following cases highlight the importance of continually engaging and collaborating with suppliers to foster a culture of accountability:



Interiors

We became aware of a potential violation of our Supplier Code of Conduct in our interiors supply chain related to recruitment practices of a labor broker. We quickly commissioned and participated in-person in two independent audits, and, upon confirmation of the risk, the supplier terminated the relationship with its labor broker, while giving contract workers the option to continue working for the supplier under new management. For mitigating future risks, our supplier established new due diligence processes for contracting partners and upstream suppliers, reimbursed all identified recruitment-related health exam fees to workers, established processes to eliminate fees paid by workers in future recruitment paths and created a new sustainability function with dedicated staff.



Battery

In 2023, we conducted detailed chain of custody pilot exercises to verify material traceability for high-risk inputs from battery cell to mine site. We worked hand-in-hand with cross-functional supplier teams to ensure management systems and documentation logs were updated to meet regulatory requirements. As a result of our engagement, suppliers increased material traceability and are strengthening their documentation processes to improve chain of custody.

Combatting Forced Labor in Our Supply Chain: 2023 Case Studies

Interiors Accessories

Aluminum

During a supplier’s first audit, worker interviews cross-checked against the supplier’s records confirmed that workers paid fees to obtain employment, faced involuntary wage deductions and were unable to access passports held by the employer—all of which are violations of Tesla’s Supplier Code of Conduct. Tesla worked with the supplier to formulate a comprehensive corrective action plan covering immediate and long-term actions, resulting in the immediate return of all 10 workers’ passports to enable freedom of movement, a company-wide investigation to understand root causes of fees paid by workers, fee repayment, an end to involuntary wage deduction and management and employee trainings. The case highlighted the importance of continually engaging and collaborating with suppliers to foster a culture of accountability.

We continue to comprehensively map our aluminum supply chain in more detail—with thorough coverage of all manufacturers, traders, transportation providers and other key entities—and completed chain of custody exercises to work toward full material traceability. For example, in one supply line, we were able to map completely upstream and determine that two mines in that supply chain are certified by the Aluminum Stewardship Initiative (ASI) Certification Performance Standard, which includes criteria on forced labor, with one mine also certified by the ASI Chain of Custody Standard, which evaluates a supplier’s traceability management systems—ultimately enabling the assessment of forced labor risk in the most upstream part of this supply chain.

New Levels of Transparency for Child Labor-Free Cobalt

At large-scale mines:

To build our batteries, we use several different cathode chemistries. Our nickel-based cathodes (NMC and NCA) contain cobalt, but others, like our iron-based cathodes (LFP), do not. While our nickel-based cathodes will continue to need cobalt, they contain less cobalt than similar cathode chemistries in the industry, and we are increasing our use of cobalt-free iron-based batteries, particularly for energy storage and standard range products.

By mapping our supply chain, we know where our cobalt comes from—and we only purchase cobalt from large-scale mines. Our direct suppliers undergo third-party audits to ensure no child labor happens at these mines and no material from unauthorized sources enters our supply chain. Four audits were conducted in 2023* and found no instances of child labor at our direct suppliers’ sites. Our suppliers took action on all the social performance findings of the audits and either completed the corrective action plan or have a detailed plan in progress.

In addition, we worked with our supplier Glencore to launch a publicly available satellite monitoring system of its Kamoto Copper Company (KCC) operation located in the DRC. High-resolution images are updated monthly and allow for anyone to see what the operations look like down to 0.5 meters of resolution, thus providing a good picture of what is happening at the mine. Users can also compare these images with images of artisanal operations, which are typically at higher risk of child labor, to identify differences in production methods. This is the first time this level of transparency was achieved as a result of a collaboration between supplier and customer in the battery minerals supply chain.

*Including against the International Council on Mining and Metals (ICMM) Performance Expectations and the Responsible Minerals Initiative (RMI) Responsible Minerals Assurance Process (RMAP). Both include provisions on child labor.



Screenshot from satellite monitoring system launched in collaboration with Tesla supplier Glencore

New Levels of Transparency for Child Labor-Free Cobalt

In artisanal mining communities:

While all of Tesla’s sources are industrial mines, we continue to co-fund the Fair Cobalt Alliance (FCA) working with artisanal and small-scale mining (ASM) communities in the DRC. We remain committed to staying engaged in the DRC to improve conditions for stakeholders impacted by cobalt mining.

In 2023, the FCA accomplished the following:

- 18 children who were found working in ASM enrolled in a comprehensive remediation program that includes re-integration to education, living stipends, and health and psycho-social support
- 21 local community savings and loans groups deployed
- 5,206 artisanal miners trained on safety standards

Cobalt: Risk Identification and Mitigation Summary



>55% of cobalt sourced directly from mines and refiners in 2023

For materials that we do not direct source, we apply the same supply chain mapping and due diligence requirements.

Risk Identification

- 11 cobalt suppliers completed an audit against a Tesla-preferred international standard covering environmental and social risks
- 100% of our direct cobalt suppliers (mines and refiners) completed an audit
- 3 cobalt suppliers completed an LCA
- Regular engagement with NGOs

Examples of Risk Mitigation Actions Completed by Suppliers

- Developed air quality management and water quality management plans
- Conducted a comprehensive third-party human rights risk assessment
- Developed a closure plan that meets international requirements
- Developed a procedure to gather, review and respond to community requests
- Assessed grievance mechanisms against expectations laid out in the United Nations Guiding Principles for Business and Human Rights

Direct Supplier Status

● Complete ● In Progress ● Commitment ● No Commitment

Supplier	Tier	Locations	Audit Status*	LCA Status
Kamoto Copper Company (Glencore)	Mine	DR Congo	● (1) (2)	●
Mutanda Mining (Glencore)	Mine	DR Congo	● (1) (2)	●
Huayou	Refiner	China	● (2)	●
CNGR	Refiner	China	● (2)	●

(1) International Council on Mining and Metals (ICMM) Performance Expectations; (2) Responsible Minerals Initiative (RMI) Responsible Minerals Assurance Process (RMAP)
Committed = written commitment to complete an asset-specific, 3rd party verified LCA within the calendar year. Completed = 3rd party verified LCA published within the past 2 years.

Nickel: Reducing the Environmental and Social Impacts in Indonesia

In 2023, 13% of Tesla's nickel came from Indonesia. We understand that Indonesian production is scaling significantly and the share of Indonesian nickel in global EV supply chains will increase. The transition to EVs will not be possible by only relying on non-Indonesian nickel. Key risks in this context relate to GHG emissions, deforestation, water pollution, indigenous and community rights and worker health and safety in the country. We invested significant resources to address these head-on with our suppliers, NGOs and the Indonesian and U.S. governments. In December 2023, a Tesla delegation focused on environmental and social impact visited mines, smelters and industrial parks in Indonesia and met with government stakeholders (this is the second Tesla visit focusing on these topics after a first visit in 2022).



Tesla staff during visit to nickel mines and smelters in Indonesia in 2023

Nickel: Reducing the Environmental and Social Impacts in Indonesia

GHG Emissions

- Requested and received four facility and production specific LCAs and GHG footprints, covering mines and smelters, with more expected in 2024
- Asked suppliers to set decarbonization targets and move away from captive coal
- Pursuing lower-carbon processing options like High-Pressure Acid Leaching (HPAL) (as opposed to higher-emitting pyrometallurgical processes)

Environmental Protection

- Engaged with NGOs, government and suppliers to promote safer mine waste practices such as dry stack tailings; we have a zero tolerance for tailings disposal into oceans

Indigenous Rights

- Engaged with NGOs, government and suppliers to explore the need for the establishment of a no-go zone for mining to protect indigenous and human rights, particularly those of uncontacted communities, in addition to supplier engagement to reinforce our commitment to protect the right of Indigenous People to grant or withhold Free, Prior and Informed Consent (FPIC)

Traceability

- One supplier built a pipeline for full traceability of nickel ore directly from a mine to a smelter

Audits

- Three identified mine sites were audited against international mining standards, with three smelters scheduled to undergo the Responsible Minerals Initiative (RMI)'s Responsible Minerals Assurance Process (RMAP) in early 2024; Tesla's expectation is that all Indonesian suppliers are audited to international standards

Nickel: Risk Identification and Mitigation Summary

>50%

of nickel sourced directly from mines and refiners in 2023

For materials that we do not direct source, we apply the same supply chain mapping and due diligence requirements.

Risk Identification

- 18 nickel suppliers completed an audit against a Tesla-preferred international standard covering environmental and social risks
- 70% of our direct nickel suppliers (mines and refiners) completed an audit
- 5 nickel suppliers or facilities completed or scheduled an LCA
- NGO engagement

Examples of Risk Mitigation Actions Completed by Suppliers

- Established detailed stakeholder mapping (communities of interest identification under some frameworks)
- Published robust human rights policies and supplier code of conduct
- Invested considerable resources to improving tailings storage facilities to bring them into conformance with international standards
- Evaluated dewatering tailings storage to reduce water withdrawals

Industry Groups

- Tesla chairs the Nickel Working Group in the Responsible Minerals Initiative (RMI)

Direct Supplier Status				
<div><div></div> Complete<div></div> In Progress<div></div> Commitment<div></div> No Commitment</div>				
Supplier	Tier	Locations	Audit Status*	LCA Status
Sudbury (Vale)	Mine + Refiner	Canada	<div></div> (3)	<div></div>
Prony Resources	Mine	New Caledonia	<div></div> (4)	<div></div>
Nickel West (BHP)	Mine	Australia	<div></div> (1)	<div></div>
Murrin Murrin (Glencore)	Mine	Australia	<div></div> (2)	<div></div>
CNGR	Refiner	China	<div></div> (2)	<div></div>
	Refiner	Indonesia	<div></div> (2)	<div></div>
Huayou	Refiner	China	<div></div> (2)	<div></div>
	Refiner	Indonesia	<div></div> (2)	<div></div>
<div>(1) International Council on Mining and Metals (ICMM) Performance Expectations; (2) Responsible Minerals Initiative (RMI) Responsible Minerals Assurance Process (RMAP); (3) Towards Sustainable Mining (TSM); (4) International Finance Corporation (IFC) Performance Standard Committed = written commitment to complete an asset-specific, 3rd party verified LCA within the calendar year. Completed = 3rd party verified LCA published within the past 2 years.</div>				

Innovations in Lithium Sourcing

Lithium is a critical input to all our batteries and another priority for responsible sourcing. Our supply chain team works closely with our own lithium refinery in Corpus Christi, Texas:

Plant Design

- Use of low-toxicity industrial reagents instead of sulfuric acid and sodium hydroxide, generating a byproduct that can be used in construction materials, instead of a hazardous byproduct with residual acid that must be disposed of
- Alkaline reagent leach process uses ~35% less natural gas compared to the traditional processes
- Additional energy optimization and heat integration reduces the plant heating load by >14 MW

Community Engagement

- Active engagement with regional educational and workforce development institutions in advisory board capacities to inform and equip the local labor market to meet the demands of technologically intensive industries
- Investments in municipal improvements and close partnerships with the regional economic development corporation to seed further economic development and growth in the region

For more information on our circular solutions programming within our own operations, please see page 50.



Tesla's lithium refinery in Corpus Christi, Texas, currently under construction

Across Our Lithium Supply Chain

In 2023, our responsible sourcing teams participated in on-site visits with current and prospective Lithium suppliers in Chile and Australia. These visits helped the team better understand suppliers’ current environmental and human rights practices, as well as decarbonization roadmaps.

Two of our direct lithium suppliers also completed or are in the process of completing an independent third-party audit against the Initiative for Responsible Mining Assurance (IRMA) Standard, Tesla’s preferred mining standard. IRMA is a multi-stakeholder led organization with the most comprehensive mining certification system and transparent reporting of results available. Its focus on continuous improvement allows suppliers to improve their results over time. Tesla has been an IRMA member since late 2021. Our goal is to encourage the uptake of IRMA across our supply chain.

5

mines completed or committed to date to an IRMA audit across our lithium, nickel and graphite supply chains



Tesla staff during a visit to a lithium processing facility in Australia in 2023

Lithium: Risk Identification Summary

>75%

of lithium sourced directly from mines and refiners in 2023

For materials that we do not direct source, we apply the same supply chain mapping and due diligence requirements.

Risk Identification

- 100% of our direct lithium suppliers (mines and refiners) completed or committed to an audit against a Tesla-preferred international standard covering environmental and social risks
- 4 lithium suppliers completed an LCA
- Reviewed NGO reports



Tesla staff during a visit to a lithium processing facility in Australia in 2023

Lithium: Risk Mitigation Summary

Examples of Risk Mitigation Actions Completed by Suppliers

- Established effective engagement with local indigenous groups and responded to allegations of lack of FPIC regarding their operations
- Tesla provided technical feedback and comment to supplier’s decarbonization plan and LCA roadmap
- Thorough limnological study completed by group of experts to evaluate local aquatic ecosystems, including biological, chemical and physical properties
- Considering options to install solar energy on top of old tailings storage facilities

Examples of Risk Mitigation Actions Completed by Suppliers as a Result of an IRMA Audit

- Suppliers substantially or fully met all critical requirements
- Suppliers currently closing gaps identified during audits, including: (1)Develop a differential approach for engaging with women and children, (2)Establish a process for a community grievance mechanism and monitor trends, (3)Establish a target for hiring local residents and (4)Operationalize a biodiversity management plan

Industry Groups

Tesla chairs the Lithium Working Group in the Responsible Minerals Initiative (RMI)

Direct Supplier Status

● Complete ● In Progress ● Commitment ● No Commitment

Supplier	Tier	Locations	Audit Status*	LCA Status
Albemarle	Mine	Chile	● (5)	●
	Mine	Australia	● (5)	●
	Refinery	Chile	● (2) (6)	●
	Refinery	China	● (2) (6)	●
Arcadium	Mine	Argentina	● (5)	●
	Refinery	China	● (2) (6)	●
	Refinery	USA	● (2) (6)	●
Ganfeng	Refinery	China	● (2) (6)	●
Yahua	Refinery	China	● (2) (6)	●

(2) Responsible Minerals Initiative (RMI) Responsible Minerals Assurance Process (RMAP); (5) Initiative for Responsible Mining Assurance (IRMA) Standard; (6) Responsible Minerals Initiative (RMI) ESG Standard
Committed = written commitment to complete an asset-specific, 3rd party verified LCA within the calendar year.
Completed = 3rd party verified LCA published within the past 2 years.

Aluminum: Pushing for the Industry to Respect Rights and Lower Emissions

We prioritize aluminum because of the high prevalence of human rights and environmental impacts across the aluminum supply chain—including bauxite mining and the carbon emissions linked to aluminum refining and smelting. We buy aluminum in the form of sheet, ingot, castings, extrusions, forgings and foil. It shows up in many systems in the car—from Tesla’s body Gigacastings to the batteries. Most of our aluminum is alloyed – meaning it is mixed with other elements to optimize engineering properties. The rising total demand for aluminum means that increased recycling is not enough to reach a truly sustainable aluminum sector. Therefore, we engage with producers of both recycled and primary material.

Direct Sourcing and Supply Chain Mapping

We source much of the aluminum used in our vehicles directly from smelters/secondary aluminum producers—sending the material to Tesla plants or to our Tier 1 suppliers. This, combined with our efforts of mapping upstream material sources where we don’t directly source the raw material, enables increased visibility and ability to conduct due diligence.



In 2024, Tesla committed to the ASI for our aluminum foundry in Lathrop, CA

Certification

As a pre-requisite for being awarded new business, Tesla continues to ask its suppliers to certify to the Aluminium Stewardship Initiative’s (ASI) Performance Standard. As of the first quarter of 2024, 92% of Cybertruck aluminum suppliers are certified or working towards this certification. Over 80% of all aluminum Tier 1 suppliers are similarly certified or working towards this certification.

ASI is one of the key industry organizations developing credible decarbonization roadmaps for the aluminum industry. We appreciate that no certification replaces due diligence. We continue to work with ASI, suppliers, and stakeholders to address and reduce risks in our aluminum supply chain in recognition of its outsized impact.

Confirmed Upstream Supplier Locations

- Bauxite Mining: Australia, China, Guinea, Iceland, Indonesia, Solomon Islands*
- Smelting: Australia, Canada, China, Germany, Norway, Malaysia, UAE, U.S.

*The purchase of bauxite from the Solomon Islands occurred before 2020. We include it in this list for transparency, but our strategy is to not further procure bauxite from the Solomon Islands.

Other Risk Mitigation Efforts

In 2023, we directly engaged key mid-tier, direct-sourced smelters, including visits of senior leadership representatives to two of the world’s largest smelters, during which we evaluated the decarbonization roadmaps of all smelters in our European supply base and aligned on strategies to decarbonize. Tesla also participated in a data pilot as part of RMI’s Horizon Zero working group on aluminum which focused on capturing embedded emissions data for aluminum, automating data transfer processes of environmental data, and capturing additional pertinent data such as percentage of post-industrial and post-consumer scrap percentages.

Ferrous Metals (Steel and Iron): Risk Identification and Mitigation Summary

We prioritize identifying and addressing risks in our ferrous materials supply chain because of the high prevalence of environmental impacts across the steel and iron supply chains—steel is a significant factor of Tesla’s supply chain GHG emissions. We buy ferrous materials in the form of sheet, castings and forgings. Steel is a primary component of many systems of the car, but shows up prominently in the body, chassis and powertrain of the vehicle as well as the structure of our energy products. Most of our ferrous materials are alloyed—meaning iron is mixed with other elements to optimize engineering properties. The rising total demand for iron and steel means that increased recycling is not enough for a truly sustainable steel sector. Therefore, we engage with producers of both recycled and primary material.

Direct Sourcing and Supply Chain Mapping

- We source much of the steel used in our vehicles directly from mills—sending the material to Tesla plants or to our Tier 1 suppliers. This direct sourcing strategy, combined with our efforts of mapping upstream material sources where we don’t directly source the raw material, enables increased visibility and ability to conduct due diligence.
- Sourcing country breakdown, based on identified sources:

Mill Country Locations: Austria, Belgium, China, France, Germany, Sweden, U.S.

Other Risk Mitigation Efforts

- In order to understand the carbon footprint of steel suppliers inside our supply chain, as well as those we don’t work with, we continued to work with Climate TRACE, a coalition of researchers and NGOs, with a mission to have an open-source global emissions inventory. Tesla worked with Climate TRACE members on how to make industrial data sets most useful for large steel purchasers. This innovative data-stream enables Tesla not only account more accurately for our current emissions, but also to perform scenarios of future sourcing strategies.
- This year, Tesla engaged with more than a dozen steel producers across multiple continents on their decarbonization strategies.

3TG (Tin, Tantalum, Tungsten and Gold): Risk Identification and Mitigation Summary

Mining communities in the Democratic Republic of the Congo (DRC) and other upstream 3TG sourcing regions are essential to the production of Tesla products. Mining in conflict-affected contexts has a history of negative impacts on communities, including human rights abuses. Our due diligence process includes supplier engagement, visiting 3TG production regions with the purpose of observing on-the-ground conditions, meeting with local stakeholders and exploring opportunities for positive impact. Through these efforts, we aim to avoid contributing to human rights abuses, conflict, and instability through our sourcing, with the ultimate aim to improve on-the-ground conditions in and around 3TG mining communities.



3TG: 2023 Key Achievements

Robust Requirements

- Communicated enhanced requirements to tier-1 suppliers and smelters/refiners (SORs)
- Surveyed tier-1 suppliers to identify SORs that process 3TG in products supplied to Tesla and country of origin of minerals
- Encouraged removal of certain actors from supply chain due to infeasibility of improvements

Stakeholder Engagement

- Solicited program feedback from NGOs, such as actors in the DRC and groups seeking to advance the rights of indigenous peoples
- Chaired the Responsible Minerals Initiative (RMI) Gold Team Working Group

“The assessment provided me an opportunity to confirm that our internal procedures and policies are aligned with the standards, and the assessment will allow us to improve more quickly.”

– Oscar, Compliance Officer

Audits

- Funded three Responsible Minerals Assurance Program (RMAP) assessments to increase compliant SORs in Tesla’s supply chain via contributions to the RMI Audit Fund
- Proposed concrete suggested improvements to industry audit program

Upstream Engagement

- Visited two artisanal mines and two processing facilities in a gold production region in Peru
- Engaged one gold aggregator to become Peru’s 1st RMAP-audited gold aggregator

Impact

- Initiated “Tesla Tech for Good” product donation project aimed at mitigating adverse human rights impacts of mining while simultaneously driving GHG reductions

More information is available in our [Conflict Minerals Report](#) and our [Responsible Sourcing Policies](#).

Impact (Continued)

- Supported the expansion of the Better Mining Supply Chain Due Diligence Monitoring, Corrective Action Plans and 3T minerals traceability program in the DRC and Rwanda to two additional 3T mine sites, enabling on one hand a substantial increase in volume of Better Mining-assured 3T minerals, and on the other hand, an increase of the number of impacted workers by 44.5% in these most upstream positions of the global minerals supply chain.

“Through constant on-site presence and the development of innovative technology, Better Mining brings necessary transparency to conditions on artisanal- and small-scale mine sites, supporting continual improvements and bridging the ethical and accountability gap from consumers towards the ASM operators and their local communities, which are vital for the achievement of the downstream’s sustainability goals. I am very proud of the proven replicability and continued impact and growth of our program over the years, and I am grateful for the commitment of our supporters in this journey.”

– Emmanuel Nguéyanouba, Director of RCS Global Better Mining Programme

Tesla Tech for Good: A Case Study in Applying Technology to Remedy Harm Associated With Supply Chain Activities

Although critical to the EV transition, mining operations can cause a range of potential adverse impacts, for example related to health and safety and the environment. Tesla believes that accelerating the world's transition to sustainable energy should not cause additional harm. The Democratic Republic of the Congo (DRC), a country of particular relevance to the mineral trade, has been in conflict for almost three decades, sustained through the trade of minerals. Too often the minerals leave the country but don't come back—a one way street. In acknowledging the consequences of mining operations, we initiated our Tesla Tech for Good product donation project, aimed at mitigating adverse human rights impacts of mining while simultaneously driving GHG reductions. During a 2022 trip to East Africa, Tesla pursued opportunities to apply our technology to mitigate adverse impacts of supply chain operations, provide remedy for harm caused, and maximize positive impact for people and the planet.

We met with Panzi Hospital & Foundation, a center of excellence in the DRC that provides holistic treatment for survivors of sexual violence—a tactic used by armed actors to perpetuate conflict, gain greater access to resources and control smuggling routes.

Panzi has touched the lives of more than 80,000 survivors of sexual violence, including those affected by wartime, and another 25,000 women with serious gynecological injuries. In collaboration with Panzi and based on their renewable energy strategy, in early 2024 Tesla donated ten Powerwalls and hardware accessories to be installed at one of Panzi's clinics in the DRC.

Tesla and Panzi share the belief that everyone should have access to sustainable, modern, and clean energy to meet their decarbonization goals and address energy insecurity—especially those who are providing life-saving healthcare.

The Powerwalls will enable Panzi to work even in times of energy loss and avoid costs associated with running diesel-fuel generators. In recognition that many social impact initiatives fail to provide long-term solutions, to support sustaining impact of the project, we have committed to fund maintenance costs on the equipment for the next ten years.

Tesla continues to seek opportunities to collaborate with organizations close to mining communities to find transformative solutions and address harm associated with supply chain activities. A sustainable future is one in which the rights of everyone are respected and included in a just energy transition.

Proactive Supplier Engagement & Risk Analysis

Global Standard

In alignment with the Organization for Economic Co-operation and Development (OECD) Due Diligence Guidance for Responsible Business Conduct, risk analysis and identification is a foundational pillar of Tesla’s Responsible Sourcing framework to understand human rights and environment-related risks and violations in its supply chain.

Responsible Sourcing Teams

Tesla’s Responsible Sourcing teams lead risk analysis efforts globally across all sourcing scopes while developing and implementing fit-for-purpose plans to prevent or mitigate actual or potential adverse impacts. Teams are strategically embedded within the supply chain organization, ensuring that environmental and social impacts of our suppliers are monitored and addressed in collaboration with supply chain leadership and buyers directly responsible for sourcing parts, materials and services along with managing supplier relationships and performance.

Collaboration with legal and compliance teams ensures cross-functional alignment. This overall structure encourages a proactive approach to identify and act on both supply chain risks and opportunities to have a positive impact globally as our operational footprint grows.

Risk-Based Approach

Tesla teams leverage the Supplier Self-Assessment Questionnaire (SAQ), Corporate Social Responsibility (CSR) audits and the Tesla Integrity Line to monitor alignment with our Supplier Code of Conduct as well as our Global Human Rights and Responsible Sourcing policies, driving a risk-based due diligence approach that informs when and where to allocate additional resources to prevent, mitigate and report adverse impacts on people, the environment and society. When the likelihood and severity of an adverse impact is high, then due diligence is more extensive.

Supplier Selection Guidelines

In 2023, we added responsible sourcing due diligence to Tesla’s internal Global Procurement Policy supplier selection guidelines to include social and environmental criteria in sourcing decisions before awarding business to any supplier, including but not limited to, CSR audit scores, SAQ results, complaints submitted via Tesla’s Integrity Line and greenhouse gas (GHG) emissions.

Supplier Self-Assessment Questionnaire (SAQ)

The Supplier Self-Assessment Questionnaire (SAQ) pushes Tesla sourcing efforts beyond generalized risk associated with certain commodities and countries by requiring each unique location providing production parts, materials or services to Tesla to submit a response to the SAQ. Suppliers affirm that they have policies, processes and controls at the manufacturing site level consistent with all Supplier Code of Conduct topic areas: labor, health and safety, environment, ethics and supply chain responsibility. This systematic process to identify risk at scale based on actual practices enables Tesla teams to proactively prioritize more extensive due diligence for high-risk suppliers based on the extent of potential impact on workers' health, safety or fundamental human rights and number of workers/employees impacted at the supplier site.

In 2023, we scaled our SAQ program from pilots to full launch reaching nearly 1,000 supplier sites and will continue our outreach in 2024. Follow-up with suppliers includes communication of risks identified and best practices along with development of supplier specific improvement plans, such as guidance on how to close policy gaps and building supply chain mapping capabilities. Additionally, we will communicate results to supply chain leadership and buyers.

Supplier Self-Assessment Questionnaire (SAQ)

Year initiated	2022
Response rate	68%
Total number of supplier manufacturing site submissions	984
Number of impacted workers/employees	1.5 million
Number of countries represented	40
% of suppliers with a social responsibility policy	85%

% of suppliers with an environmental policy	87%
% of suppliers with a health and safety policy	93%
% of suppliers with a Supplier Code of Conduct	81%
% of suppliers that have conducted a supply chain mapping exercise to identify upstream (e.g., Tier 2, Tier 3, Tier 4) suppliers	61%

Supply Chains Assessed

All direct supplier categories, including batteries, aluminum, chemicals, etc.	Indirect materials/services Service centers, construction and on-site contractors
--	--

Grievance Mechanisms

We receive concerns related to responsible sourcing through a variety of grievance channels. 2023 was the first full year the Tesla Integrity Line was available to external parties to raise a potential concern. There is a clear process, detailed and publicly available [here](#). Tesla Integrity Line was added to the Tesla Supplier Portal in 2023 to make it more accessible to supply chain workers with access to the Portal.

Grievance Channel	Number of Concerns Related to Responsible Sourcing
Tesla Integrity Line	1
Responsible Business Alliance	1
Responsible Minerals Initiative’s Minerals Grievance Platform	2
Total	4

Grievance Mechanisms

Below are three examples of concerns received and how we acted on them:

Supply Chain	Category of Concern	Process to Address Concern	Outcome
Battery	Alleged improper use of funds	Engaged with involved parties, launched investigation with compliance team and external counsel, reviewed documents and process	Found no breach of contract and worked with the partner to improve processes
Gold	Alleged deforestation, forced labor, human rights concerns	Engaged with audit programs, engaged directly with gold refiners, sought to understand concerns of impacted stakeholders by engaging directly with an organization that seeks to advance the rights of Indigenous peoples	Encouraged removal of certain actors from Tesla’s upstream supply chain
Tier 2 interior lighting	Alleged worker-paid recruitment fees	Engaged directly with Tier 1 supplier to launch investigation	Engaged Tier 1 supplier with audit programs

In addition to promoting supply chain use of the Tesla Integrity Line, as part of our CSR Audit Program, we assess suppliers’ conformance with our Supplier Code of Conduct expectation to maintain a grievance mechanism of their own. This is assessed through site observation, records review and interviews of management and workers. In 2023, 96% of supplier facilities demonstrated conformance with this expectation.*

We also act on concerns raised through avenues such as via NGOs, investors, customers and employees, among others. For continual improvement we are exploring opportunities to improve supplier awareness of Tesla’s Integrity Line. In the future, we seek to incorporate input from affected-stakeholders on our grievance-handling process, including representatives from vulnerable groups and human rights defenders with the goal to ensure that our mechanism is responsive to the needs of affected stakeholders.

*Based on Initial Audits conducted during 2023 against Tesla’s Supplier Code of Conduct

Sourcing for Social Impact

We invest in communities where we operate—not just in our direct operations but in our supply chain as well to ensure that investments in a sustainable future are equitable. Sourcing for Social Impact programs promote purchasing policies, programs and processes that contribute to socio-economic benefits where Tesla suppliers operate. We operate and source from all types of communities and want to make sure that everyone has access to economic development opportunities in the sustainable energy future.

Programs

Specific programs promote inclusive sourcing from suppliers that traditionally would not have access to procurement opportunities.

We established a Gigafactory Texas Historically Underutilized Business (HUB) program in 2020 as part of our Economic Agreement with Travis County with a focus on identifying suppliers in construction materials and services to support ongoing factory expansion.

More broadly, the purpose of the agreement is to stimulate and encourage business and commercial activity in Travis County as Tesla invests in new construction of Gigafactory Texas operating facilities. Since 2020, Tesla has spent over \$100 million with qualified HUB program suppliers, supporting the growth of small-, minority- and women-owned businesses in Texas.

External Stakeholder Engagement

Held face-to-face meetings with six different Austin-area minority supplier and small business chambers of commerce/councils for in-depth learning sessions on their capabilities and how to leverage them to increase HUB supplier participation.

Became a corporate member of the Southwest Minority Supplier Development Council (SMSDC). SMSDC is a multi-stakeholder organization headquartered in Austin focused on minority-owned business (MBE) advocacy, development, certification and connection. Joining SMSDC as a corporate member supports ongoing efforts to identify and increase spend with HUB suppliers.

Moreover, ongoing corporate member training services will further strengthen Tesla’s Sourcing for Social Impact program to be in alignment with best practices while building relationships with Austin-area stakeholders.

Internal Stakeholder Engagement

Led sourcing organization wide training on Sourcing for Social Impact—covering three learning objectives: 1) explain why sourcing for impact matters, 2) identify resources to search for suppliers and track spend and 3) commit to at least one action which contributes to Tesla's Sourcing for Social Impact program.

Launched Sourcing for Social Impact Steering Committee comprised of buyers, supply chain leadership and global sustainability teams to provide stakeholder advisory support, guidance and strategic oversight of the program to ensure its success by embedding initiative objectives across sourcing teams.

Sourcing for Social Impact

\$1.4B

inclusive spend
since 2021

32%

of year-over-year
inclusive spend increase

45%

of year-over-year increase in
number of impacted suppliers

Corporate Social Responsibility Audits

In 2023, our Corporate Social Responsibility (CSR) audit program continued to be a key component of how we identify and mitigate risks at our suppliers’ sites. It provides us with the ability to have an independent assessment of our direct supplier’s performance to our Supplier Code of Conduct. Our requirement of Corrective Action Plans for non-conformances identified during the audit also means we are contributing to tangible improvements in the lives of workers at our suppliers’ facilities, regardless of being employees or contract workers, as well the processes and management systems at supplier facilities. Our own audit team continued to attend a large portion of on-site audits, including 50% of initial audits, to stress the importance of the program and ensure Tesla’s quality expectations were met.

We strengthened our already stringent expectations of suppliers for what is considered sufficient to pass an audit. Until 2023, this included only the requirement of zero priority non-conformances to avoid a closure audit. In 2023 we added the expectation that suppliers have a score of 60% or higher, otherwise they must undergo a complete re-audit of their facility within one year.

As part of our quality assurance process, Tesla implemented an auditor training program, reviewing Tesla’s process and requirements with auditors approved to conduct audits for Tesla. These trainings involved 134 auditors and included a comprehension test at its conclusion.

We also began incorporating upstream supplier audit results into our CSR audit program, a recognition that our responsibility does not stop at tier 1 suppliers and that we must continue to promote best practices throughout the supply chain. We hold these audits to the same standard: audits conducted to the RBA’s audit checklist and by an independent firm approved by the RBA.

Initial Audits	156
Closure Audits	73
Workers Impacted by Audits	73,065
Countries included in audits	11

Corporate Social Responsibility Audits

Tesla bases its selection of tier-1 suppliers for CSR audit on the following criteria:

Risk Component	Weighting
Country	30%
Spend	25%
SAQ	20%
Product	15%
Supplier Impact	10%

Supplier Audit Findings (2019–2023)

	2019	2020	2021	2022	2023
Audits Conducted (Initial+Closure)	109	79	55	170	229
Average Non-Conformance per Audit*	24	20	15	20	19
Labor	30.5%	30.2%	37.6%	33.0%	31.9%
Health & Safety	29.1%	35.5%	31.3%	31.5%	33.9%
Environment	13.2%	14.6%	13.0%	14.2%	13.0%
Ethics	3.8%	0.6%	0.5%	1.8%	1.4%
Management Systems	23.5%	19.0%	17.7%	19.5%	19.8%

* Breakdown for initial audits only

Appendix

Supporting Materials

TCFD	142
SASB	143
United Nations SDG Alignment	144
Key Metrics	146
Management Assertion	152

TCFD

Topic	Accounting Metric	Response
Governance	Describe the Board’s oversight of climate-related risks and opportunities.	Please see "Governance: Overview" and "Managing Climate Risk" on pages 6 and 10 of this report.
	Describe management's role in assessing and managing climate-related risks and opportunities.	Risks: Please see "TCFD: Physical Climate Risk Assessment" on page 11 of this report. Please see “Sustainability Assessment" on page 8 of this report. Opportunities: Please see "Our Mission" on page 5 of this report. Please see “Sustainability Assessment" on page 8 of this report.
Strategy	Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	Opportunity: Please see "Our Mission" on page 5 of this report. Transition Risk: Please see "Governance: Managing Climate Risk" on page 10 of this report for climate-related procurement risks. Please see "Governance: Managing Climate Risk" on page 10 of this report for other climate-related transition risks. Please see “Sustainability Assessment" on page 8 of this report. Physical Risk: Please see "TCFD: Physical Climate Risk Assessment" on page 11 of this report.
	Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy and financial planning.	Analysis of financial-related impacts from climate-related risks is ongoing. Opportunities: Please see "Our Mission" on page 5 of this report.
	Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	Please see "TCFD: Physical Climate Risk Assessment" on page 11 of this report. Additionally, Tesla's Responsible Sourcing Team works closely with critical suppliers to ensure they are hardening their operations against future climate risk. See Supply Chain section, pages 113-130.
Risk Management	Describe the organization's processes for identifying and assessing climate-related risks.	Please see "Governance: Overview" and "Managing Climate Risk" on pages 6 and 10 of this report, and "TCFD: Physical Climate Risk Assessment" on page 11 of this report.
	Describe the organization's processes for managing climate-related risks.	Tesla's Responsible Sourcing Team works closely with our suppliers to ensure they are operating in a way that mitigates future climate risk. For further discussion of these efforts, please see page 113 of this report.
	Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organization's overall risk management.	Please see “Governance: Managing Climate Risk” on page 10 of this report.
Metrics & Targets	Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	Please see more information on our GHG emissions on page 10 and "TCFD: Physical Climate Risk Assessment" on page 11 of this report.
	Disclose Scope 1, Scope 2 and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	Please see "Key Metrics: GHG Emissions" on pages 146-147 of this report.
	Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	Please see “Decarbonization at Tesla” on pages 37-46 of this report. Please see "TCFD: Physical Climate Risk Assessment" on page 11 of this report.

SASB

Topic	Accounting Metric	Response
Product Safety	Percentage of models rated by NCAP programs with overall 5-star safety ratings, by region.	Please see pages 61–70 for our discussion of vehicle safety. Please see page 63 for specifics related to our 5-star safety ratings.
	Number of safety-related defect complaints, percentage investigated.	Tesla reviews 100% of NHTSA VOQ complaints filed for any and all Tesla vehicles produced.
	Number of vehicles recalled (percentage conducted with OTA software update*).	Number of U.S. recalls in 2023 (how many of those were software only): 13 (46%) Number of U.S. vehicles affected in 2023 (how many of those were software only): 2,590,571 (99%) Number of Global recalls in 2023 (how many of those were software only): 17 (41%) Number of Global vehicles affected in 2023 (how many of those were software only): 5,729,212 (99%)
Labor Practices	Percentage of active workforce covered under collective bargaining agreements.	No Tesla employees in the U.S. are covered by a collective bargaining agreement. Some Tesla employees outside of the U.S. are covered by collective bargaining agreements only to the extent required by law.
	(1) Number of work stoppages and (2) total days idle.	0/0
Fuel Economy and Use-Phase Emissions	Sales-weighted average passenger fleet fuel economy, by region.	Please see pages 28–30 for discussion/data.
	Number of (1) zero emission vehicles (ZEV), (2) hybrid vehicles and (3) plug-in hybrid vehicles sold.	Tesla only sells zero-emission vehicles. In 2023, we delivered 1,808,581 vehicles.
	Discussion of strategy for managing fleet fuel economy and emissions risks and opportunities.	Please see page 27 for a discussion on fleet fuel economy. Please see Sustainability Assessment on page 8 for a discussion on climate-related risks and opportunities.
Materials Sourcing	Description of the management of risks associated with the use of critical materials.	Please see Supply Chain section, pages 113–130.
Materials Efficiency and Recycling	Total amount of waste from manufacturing, percentage recycled.	Please see Key Metrics on page 148.
	Weight of end-of-life material recovered, percentage recycled.	We make the best effort to recycle every battery pack we can. Please see pages 50 for a discussion on our circular solutions programming. Please see page 39 for a discussion on our end-of-life methodology. Please see Key Metrics on page 149 for our 2022 and 2023 end of life emissions.
	Average recyclability of vehicles sold.	Please see page 50 for a discussion on our circular solutions programming.
Number of Vehicles Manufactured		1,845,985
Number of Vehicles Sold		1,808,581

United Nations SDG Alignment

The United Nations defined a blueprint of 17 sustainable development goals to meet the urgent environmental, social, political and economic challenges facing our world. We understand that companies can play a critical role in providing solutions to these challenges. Our mission to accelerate the world’s transition to sustainable energy directly addresses some of these challenges—our products and services have helped to create industry demand for sustainable energy products.

In 2023, we conducted a sustainability assessment to determine strategic focus areas both material to the business and salient to the society and the environment (please see page 8 for more information). On the next page, we’ve mapped our focus areas to the most relevant Sustainable Development Goals (UN SDGs).

United Nations SDG Alignment Goals

UN SDGs	Focus Areas
No Poverty	Responsible Sourcing
Zero Hunger	Child Labor & Forced Labor
Good Health and Well-Being	Waste Management & Recycling, Circularity Product Quality & Safety Responsible Sourcing
Quality Education	External Stakeholder Engagement
Gender Equality	Respectful Workplace & Equal Opportunities
Clean Water and Sanitation	Water Use & Management
Affordable and Clean Energy	Inclusive Energy Transition
Decent Work and Economic Growth	Product Quality & Safety Responsible Sourcing Grievance Mechanisms & Access to Remedy Responsible Data & Cybersecurity Responsible AI Inclusive Energy Transition Occupational Health & Safety Talent Management & Employee Wellbeing Employee Engagement External Stakeholder Engagement Respectful Workplace & Equal Opportunities
Industry, Innovation and Infrastructure	Government Relations Policy

UN SDGs	Focus Areas
Reduced Inequalities	Government Relations Policy Inclusive Energy Transition
Sustainable Cities and Communities	Talent Management and Employee Wellbeing
Responsible Consumption and Production	Waste Management & Recycling, Circularity Air Quality & Reducing Toxic Emissions Product Quality & Safety Responsible Data & Cybersecurity Responsible AI Occupational Health & Safety
Climate Action	Biodiversity Climate Change & Risk Management Renewable Energy & Energy Efficiency Inclusive Energy Transition
Life Below Water	Biodiversity Waste Management & Recycling, Circularity
Life on Land	Waste Management & Recycling, Circularity
Peace, Justice and Strong Institutions	Business Ethics & Anti-Corruption Government Relations Policy Grievance Mechanisms & Access to Remedy Child Labor & Forced Labor Respectful Workplace & Equal Opportunities
Partnerships for the Goals	Government Relations Policy

Key Metrics

As we consistently monitor and refine our carbon footprint reporting, it's inevitable that we'll need to update emissions data from previous years. Our methodologies have only gotten more precise as we have been able to gather more real, granular, and regionalized data.

Please refer to the most recent Impact Report for accurate GHG emission figures for historical years.

Scope 1 and Scope 2 GHG Emissions (mtCO₂e)

2021	GHG Emissions (mtCO ₂ e)	Scope 1	Scope 2 (Location Based)	
	Manufacturing + Support	124,000	342,000	
	SSD	31,000	35,000	
	Other	30,000	26,000	
	Totals	185,000	403,000	588,000
2022	GHG Emissions (mtCO ₂ e)	Scope 1	Scope 2 (Location Based)	
	Manufacturing + Support	148,000	305,000	
	SSD	27,000	74,000	
	Other	27,000	29,000	
	Totals	202,000	408,000	610,000
2023	YoY Manufacturing GHG Emissions (mtCO ₂ e/vehicle)	-29%		
	GHG Emissions (mtCO ₂ e)	Scope 1	Scope 2 (Location Based)	
	Manufacturing + Support	151,000	331,000	
	SSD	29,000	98,000	
	Other	31,000	37,000	
	Totals	*211,000	*466,000	677,000
	YoY Manufacturing GHG Emissions (mtCO ₂ e/vehicle)	-10%		

*Third-party assurance provider performed an attest engagement on the Scope 1 and 2 GHG emission totals but did not evaluate emissions by site type. Please see the assurance letter at the end of this report.

Scope 3 GHG Emissions (mtCO₂e)

Scope 3 Categories	2023 GHG Emissions (mtCO ₂ e)	2022 GHG Emissions (mtCO ₂ e)
Category 1	39,020,000	30,701,000*
Category 2	4,490,000	4,267,000
Category 3	247,000	227,000
Category 4	558,000	557,000
Category 5	255,000	478,000
Category 6	53,000	37,000
Category 7	369,000	608,000
Category 8	75,000	77,000
Category 9	314,000	389,000*
Category 11	3,207,000	3,409,000
Category 12	766,000	421,000

*Restated 2022 values are due to increase in data accuracy capability.

Key Metrics

Vehicle Safety				Waste Generated in Manufacturing (metric tons)			
Number of Vehicular Accidents Per Million Miles Driven (2022)	2023	2022	2021	2023	2022*	2021	
Autopilot Engaged	0.18	0.18		Recycled Hazardous Waste	6,273	6,641	13,092
FSD Engaged	0.21	0.31		Recycled Non-Hazardous Waste	347,304	286,518	230,916
No Active Safety	0.81	0.68		Disposed Hazardous Waste	4,345	20,471	18,599
Total US Vehicle Fleet	1.49	1.53		Disposed Non-Hazardous Waste	29,307	38,737	14,244
Health & Safety				Incinerated Hazardous Waste	7,567	n/a	n/a
ASTM Level One Rate	2.51	2.86	3.57	Incinerated Non-Hazardous Waste	2,415	n/a	n/a
Fatalities	1*	0	1	Total	397,211	352,366	276,851
*Unfortunately, Tesla experienced an employee fatality in China in February of 2023.				YoY Reduction Total Waste/Vehicle	-6.3%	-5.42%	
				Waste numbers have previously been reported in short tons—all numbers have been stated (for 2021 and 2022, restated) in metric tons and will be reported here on out in metric tons.			
				*Restated 2022 values are due to increase in data accuracy capability.			
Uptime of Tesla Supercharger Sites				Water Withdrawal for Manufacturing (cubic meters)			
Uptime of Supercharger Sites*	2023	2022	2021	2023	2022	2021	
Uptime	99.97%	99.95%	99.96%	Total Freshwater Withdrawal	3,871,927	3,363,398	2,874,904
*Uptime of Supercharger sites reflects the average percentage of sites globally that had at least 50% of their daily capacity functional for the year.				YoY Reduction Total Water/Vehicle	-2.4%	-15%	
Energy Consumption (kWh)							
Electricity Consumption (non-renewable)	1,129,864,000						
Electricity Consumption (renewable)	420,083,000						
Fuel Consumption	1,029,221,000						

Average Lifecycle Emissions

United States (g CO ₂ e/mi)			
Model 3/Y (Standard Range RWD)	Manufacturing Phase & Supply Chain	Use Phase	Total
Personal Use (solar charged)	72	0	72
Personal Use (grid charged)	62	54	116
ICE	48	397	445

Europe			
Model 3/Y (Standard Range RWD)	Manufacturing Phase & Supply Chain	Use Phase	Total
Personal Use (solar charged)	114	0	114
Personal Use (grid charged)	103	37	139
ICE	64	396	459

China (g CO ₂ e/mi)			
Model 3/Y (Standard Range RWD)	Manufacturing Phase & Supply Chain	Use Phase	Total
Personal Use (solar charged)	114	0	114
Personal Use (grid charged)	103	129	231
ICE	65	400	466

United States (kgCO ₂ e/kWh)	
Megapack 2XL*	114

*Use phase emissions from our energy storage systems calculations are in progress, including development of methodologies and the refining of real-time data

New York (g CO ₂ e/mi)			
Model 3/Y (Standard Range RWD)	Manufacturing Phase & Supply Chain	Use Phase	Total
Personal Use (solar charged)	72	0	72
Personal Use (grid charged)	62	46	108
ICE	48	397	445

France (g CO ₂ e/mi)			
Model 3/Y (Standard Range RWD)	Manufacturing Phase & Supply Chain	Use Phase	Total
Personal Use (solar charged)	114	0	114
Personal Use (grid charged)	103	11	113
ICE	64	396	459

Sichuan Province (g CO ₂ e/mi)			
Model 3/Y (Standard Range RWD)	Manufacturing Phase & Supply Chain	Use Phase	Total
Personal Use (solar charged)	114	0	114
Personal Use (grid charged)	103	32	134
ICE	65	400	466

Awards and Certifications

EHS Awards

- Tesla Global Energy—The National Safety Council Innovation Award Runner Up for the creation and implementation of the leadership engagement tool used to verify and validate essential safeguards
- Gigafactory Texas—Austin Water Excellence in pretreatment Award
- Fremont Factory—True CBCI Gold Certified zero waste
- Gigafactory Shanghai—UL 2999 Zero Waste to Landfill Platinum Award
- Gigafactory Shanghai—China National Green Factory Award
- Fremont Factory—Certificate of Merit Award—Union Sanitary District for "exceeding USD's standards for compliance, working in a collaborative relationship with USD's Environmental Compliance team, and working with USD in protecting our communities and SF Bay"

Certifications

- Gigafactory Nevada, Gigafactory New York, Gigafactory Shanghai—ISO 14001 and ISO 45001 certified
- Tesla, Inc. Information Security, Cybersecurity, and Privacy Protection ISO/IEC 27001 certified
- Australia Energy—EHS management system certification from the OFSC, Office of the Federal Safety Commission

Diversity EEO-1 Table

*Data only includes U.S. employees (Active/On Leave as of 12/31/2022) who identified their Gender as Male or Female, and also identified Race in their profile

Job Categories	Total							
	White	Hispanic or Latino	Black or African American	Native Hawaiian	Asian	American Indian	Two or More Races	Overall Totals
Service Workers	33%	30%	14%	3%	13%	2%	4%	100%
Laborers & Helpers	29%	44%	13%	3%	5%	0%	6%	100%
Operatives	18%	38%	22%	3%	14%	2%	5%	100%
Craft Workers	39%	41%	8%	2%	7%	1%	3%	100%
Administrative Support	42%	28%	10%	1%	14%	1%	5%	100%
Sales Workers	39%	28%	13%	1%	13%	1%	6%	100%
Technicians	32%	36%	8%	2%	17%	1%	4%	100%
Professionals	40%	13%	3%	0%	39%	0%	3%	100%
First/Mid Officials & Mgrs	47%	23%	7%	2%	17%	1%	4%	100%
Exec/Sr. Officials & Mgrs	55%	7%	3%	0%	33%	1%	3%	100%
Total	29%	32%	13%	2%	18%	1%	4%	100%

Male							
White	Hispanic or Latino	Black or African American	Native Hawaiian	Asian	American Indian	Two or More Races	Total Male
24%	19%	8%	3%	11%	1%	3%	69%
28%	42%	12%	2%	4%	0%	5%	92%
13%	26%	15%	2%	10%	1%	3%	71%
38%	40%	8%	2%	6%	1%	3%	98%
29%	20%	6%	1%	10%	0%	3%	69%
29%	19%	9%	1%	9%	1%	4%	71%
30%	32%	7%	2%	14%	1%	4%	90%
32%	10%	2%	0%	29%	0%	2%	77%
39%	19%	6%	2%	13%	1%	3%	82%
44%	7%	2%	0%	27%	1%	1%	82%
24%	25%	10%	2%	14%	1%	3%	77%

Female							
White	Hispanic or Latino	Black or African American	Native Hawaiian	Asian	American Indian	Two or More Races	Total Female
9%	12%	6%	0%	2%	0%	1%	31%
2%	2%	1%	0%	1%	0%	1%	8%
4%	11%	6%	1%	4%	0%	2%	29%
1%	1%	0%	0%	0%	0%	0%	2%
13%	8%	3%	1%	5%	0%	2%	31%
10%	9%	4%	0%	4%	0%	2%	29%
2%	3%	1%	0%	2%	0%	0%	10%
8%	3%	1%	0%	11%	0%	1%	23%
8%	4%	2%	0%	4%	0%	1%	18%
11%	0%	1%	0%	6%	0%	1%	18%
5%	7%	4%	0%	5%	0%	1%	23%

Report of Independent Accountants



To the Board of Directors of Tesla Inc.

We have reviewed the accompanying management assertion of Tesla, Inc. (Tesla) that the greenhouse gas (GHG) emissions metrics for the year ended December 31, 2023, in management’s assertion are presented in accordance with the assessment criteria set forth in management’s assertion. Tesla’s management is responsible for its assertion and for the selection of the criteria, which management believes provide an objective basis for measuring and reporting on the GHG emissions metrics. Our responsibility is to express a conclusion on management’s assertion based on our review.

Our review was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants (AICPA) in AT-C section 105, Concepts Common to All Attestation Engagements, and AT-C section 210, Review Engagements. Those standards require that we plan and perform the review to obtain limited assurance about whether any material modifications should be made to management’s assertion in order for it to be fairly stated. The procedures performed in a review vary in nature and timing from, and are substantially less in extent than, an examination, the objective of which is to obtain reasonable assurance about whether management’s assertion is fairly stated, in all material respects, in order to express an opinion. Accordingly, we do not express such an opinion.

Because of the limited nature of the engagement, the level of assurance obtained in a review is substantially lower than the assurance that would have been obtained had an examination been performed. We believe that the review evidence obtained is sufficient and appropriate to provide a reasonable basis for our conclusion.

We are required to be independent and to meet our other ethical responsibilities in accordance with relevant ethical requirements related to the engagement.

The firm applies the Statements on Quality Control Standards established by the AICPA.

The procedures we performed were based on our professional judgment. In performing our review, we performed inquiries, performed tests of mathematical accuracy of computations on a sample basis, read relevant policies to understand terms related to relevant information about the GHG emissions metrics, reviewed supporting documentation in regard to the completeness and accuracy of the data in the GHG emissions metrics on a sample basis, and performed analytical procedures.

GHG emissions quantification is subject to significant inherent measurement uncertainty because of such things as GHG emissions factors that are used in mathematical models to calculate GHG emissions, and the inability of these models, due to incomplete scientific knowledge and other factors, to accurately measure under all circumstances the relationship between various inputs and the resultant GHG emissions. Environmental and energy use data used in GHG emissions calculations are subject to inherent limitations, given the nature and the methods used for measuring such data. The selection by management of different but acceptable measurement techniques could have resulted in materially different amounts or metrics being reported.

As discussed in management’s assertion, Tesla has estimated GHG emissions for certain emissions sources for which no primary usage data is available.

Based on our review, we are not aware of any material modifications that should be made to Tesla’s management assertion in order for it to be fairly stated.

PricewaterhouseCoopers LLP

San Jose, California
April 25, 2024

Management Assertion

Scope 1 & 2 GHG Emissions

Overview

With respect to the greenhouse gas (GHG) emissions metrics for the year ended December 31, 2023, presented in table 2 below, which are also included in this Tesla Impact Report 2023 as identified by the “*” symbol, management of Tesla, Inc. (Tesla) asserts that the GHG emissions metrics are presented in accordance with the assessment criteria set forth below.

Management is responsible for the selection of the criteria, which management believes provide an objective basis for measuring and reporting on the GHG emissions metrics, and for the completeness, accuracy, and validity of the GHG emissions metrics. Tesla’s GHG emissions are rounded up to the nearest thousand.

Organizational Boundary

Tesla uses the operational control approach to account for and report its global Scope 1 and Scope 2 GHG emissions. This includes sites engaged in manufacturing; sales, service, and delivery; and other activities described below. Data Centers (leased locations that house Tesla computer systems and associated components), Superchargers (electric vehicle fast charging stations), and beginning in 2023, malls (leased retail storefront within shopping malls for Tesla products) are not included in our boundary as Tesla determined they do not have operational control over emissions from these sites. Data for new or acquired sites are included once the site has been operating for at least a year at the beginning of the reporting period. Conversely, sites that closed or ceased operations during the reporting period are not included in Tesla’s organizational boundary.

Management Assertion

Scope 1 & 2 GHG Emissions

Table 1: Description of Tesla Sites

Site Type	Site Activities
Manufacturing	<ul style="list-style-type: none">• Manufacture Tesla products, including vehicles, Superchargers, solar tiles, and energy storage products.• Support manufacturing through the design and manufacture of equipment and tools used at manufacturing sites or by storing manufacturing materials, parts, or finished products.
Sales, Service, and Delivery (SSD)	<ul style="list-style-type: none">• Sell products, provide vehicle service, store parts for vehicle service, and deliver vehicles.
Other	<ul style="list-style-type: none">• Conduct research & development, administration, energy product warehousing and deployment, and other mixed-use warehousing.

Table 2: Metrics – GHG Emissions

GHG Emissions and Assessment Criteria ^{1,2,3}	Quantity
Scope 1 GHG Emissions ⁴ Direct GHG emissions occurring from stationary combustion, mobile combustion, refrigerant losses, and process emissions.	211,000 Metric Tons CO ₂ e
Scope 2 GHG Emissions (location-based) ⁵ Indirect GHG emissions from the generation of electricity and district heating purchased by Tesla for site operations.	466,000 Metric Tons CO ₂ e

Management Assertion

Scope 1 & 2 GHG Emissions

GHG Emissions Disclosure

- 1

Tesla considers the principles and guidance of the World Resources Institute (WRI) and the World Business Council for Sustainable Development's (WBCSD) Greenhouse Gas Protocol Initiative's A Corporate Accounting and Reporting Standard, Revised Edition, and GHG Protocol Scope 2 Guidance, An Amendment to the GHG Protocol Corporate Standard (together the "GHG Protocol") to guide the criteria to assess, calculate and report GHG emissions.
- 2

GHG emissions quantification is subject to significant inherent measurement uncertainty because of such things as GHG emissions factors that are used in mathematical models to calculate GHG emissions, and the inability of these models, due to incomplete scientific knowledge and other factors, to accurately measure under all circumstances the relationship between various inputs and the resultant GHG emissions. Environmental and energy use data used in GHG emissions calculations are subject to inherent limitations, given the nature and the methods used for measuring such data. The selection by management of different but acceptable measurement techniques could have resulted in materially different amounts or metrics being reported.
- 3

Carbon dioxide equivalent (CO₂e) emissions are inclusive of carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄), and industrial gases such as hydrofluorocarbons (HFCs) and sulfur hexafluoride (SF₆). Perfluorocarbons (PFCs) and nitrogen trifluoride (NF₃) are not emitted by Tesla's sites. Emissions data by individual gas is not disclosed as a majority of CO₂e in Table 1 relates to CO₂. These carbon dioxide equivalent emissions utilize Global Warming Potentials (GWPs) defined by the Intergovernmental Panel on Climate Change's (IPCC) Fifth Assessment Report (AR5 – 100 year), unless a different Assessment Report is already embedded in the emission factor source. Carbon dioxide equivalent emissions are calculated by multiplying actual or estimated energy and fuel usage, refrigerant gas loss or process emissions by the relevant emission factor and GWP. All emission factors are updated annually where applicable.

Management Assertion

Scope 1 & 2 GHG Emissions

GHG Emissions Disclosure

- 4
- Related to Scope 1 GHG emissions:
- a. Stationary combustion (natural gas):
 - Combustion from stationary equipment and machinery.
 - Global natural gas usage data was collected from monthly utility invoices obtained from third-party providers.
 - If usage data was not available, Tesla estimated the natural gas usage by determining an annual natural gas usage rate per square foot based on actual 2023 monthly natural gas usage data for sites in a similar geographic location and type of site. This rate was then multiplied by the square footage of the site building space.
 - Emission factors: United States (U.S.) Environmental Protection Agency (EPA) Emission Factors for Greenhouse Gas Inventories 2023.

b. Stationary and mobile combustion (propane, diesel, and gasoline):
 - Combustion from emergency and portable generators, powered industrial vehicles (e.g., forklifts), temporary space heaters, and other portable equipment (e.g., landscaping equipment).
 - Propane, diesel, and gasoline usage data was collected from invoices and fuel reports obtained from third-party providers.
 - Emission factors: U.S. EPA Emission Factors for Greenhouse Gas Inventories 2023.

c. Emissions from refrigerant loss to the atmosphere:
 - Fugitive emissions from refrigeration, air conditioning, or similar equipment resulting from leakage and service over the operational life of the equipment.
 - Loss data was collected from invoices and vendor reports for refrigerant refills purchased and/or installed.
 - Emission factors from refrigerant loss: U.S. EPA Emission Factors for Greenhouse Gas Inventories 2023; United Kingdom (UK): UK database published by the Department for Environment Food & Rural Affairs (DEFRA) 2023; IPCC Fifth Assessment Report 2013.

d. Fleet mobile combustion (diesel and gasoline):
 - Combustion from the operation of Tesla's on-road and non-road vehicles.
 - Diesel and gasoline usage (volume) was collected from fuel cards issued by Tesla's fleet management partner. Vehicle miles driven by Tesla on-road vehicles was collected from odometer readings and real time telemetrics on each vehicle.
 - Tesla classified vehicles by type: diesel medium and heavy-duty vehicles, gasoline passenger cars, gasoline light-duty trucks, gasoline heavy-duty vehicles, and non-road
 - industrial/commercial equipment. Temporary light duty fleet additions for operational use were categorized as 'other', for which only CO₂ emissions are calculated, because Tesla does not have detailed information on what type of vehicles were rented and miles driven.
 - CO₂ emissions were calculated by multiplying the relevant emission factor by the volume of diesel and gasoline used by Tesla's on-road and non-road vehicles for the year ended December 31, 2023.

Management Assertion

Scope 1 & 2 GHG Emissions

GHG Emissions Disclosure

- CH₄ and N₂O emissions were calculated by multiplying the relevant emission factor (depending on vehicle type and age) by the miles driven by Tesla’s on-road vehicles, and by the volume of diesel and gasoline used by Tesla’s non-road vehicles for the year ended December 31, 2023.
- Emission factors: U.S. EPA Emission Factors for Greenhouse Gas Inventories 2023.
- e. Process emissions:
 - Lithium-ion battery cell recycling:
 - Emissions from processing manufacturing scrap lithium-ion cells at the Gigafactory Nevada cell recycling site.
 - The concentration of CO₂ and CH₄ in emissions (emission rates) were measured during two emissions source tests. GHG emissions were calculated by multiplying the quantity of manufacturing scrap processed, as recorded by the recycling plant operations team, by the CO₂ and CH₄ emission rates developed based on the emissions source tests.
 - Emission of CO₂ resulting from cleaning plastic parts with liquid CO₂:
 - CO₂ emissions were assumed to equal the mass of liquid CO₂ used in the cleaning process as measured by liquid CO₂ sensors on the tank.
 - Combustion of volatile organic compounds (VOCs) emitted to thermal oxidizers at manufacturing sites:
 - The quantity of VOCs emitted to thermal oxidizers were estimated by calculating the potential to emit or by a continuous emissions monitoring system.
 - The CO₂ equivalent emissions were calculated using the number of carbon atoms in the VOCs, the molecular weight and the mass of the VOC exhausted to the thermal oxidizers and multiplied by the destruction efficiency of the thermal oxidizer.
- f. Estimated emissions from the sources above account for approximately 3.8% of Scope 1 GHG emissions.
- g. Excluded Scope 1 GHG emissions: Tesla excluded the following sources of GHG emissions, which are estimated to represent less than 1 percent of Tesla’s reported Scope 1 GHG emissions:
 - GHG emissions from emergency stabilization of damaged and potentially damaged lithium-ion cells.
 - GHG emissions resulting from the chemical reaction of two-part polyurethane foam adhesives.
 - GHG emissions resulting from oxy-acetylene welding used to maintain sites and equipment.

Management Assertion

Scope 1 & 2 GHG Emissions

GHG Emissions Disclosure

- 5

Related to Scope 2 GHG emissions (location-based):

 - GHG emissions from the generation of electricity purchased by Tesla for site operations. For sites that include Superchargers, Tesla did not include electricity procured for customer use through the Supercharger stations as those emissions are included in Scope 3, Category 11 Use of Sold Products. For purchased electricity relative to Data Centers, those emissions are included in Scope 3, Category 8 Upstream Leased Assets.
 - Global electricity usage data was collected from monthly utility invoices obtained from third-party providers.
- If monthly usage data was not available:
 - For sites with less than 12 months of usage data, Tesla estimated the electricity usage by extrapolating the average consumption for the available months in the reporting period.
 - Tesla estimated the electricity usage by determining an annual electricity usage rate per area based on 2023 monthly electricity usage data for sites in a similar geographic location and type of site. This rate was then multiplied by the area of the site building space.
 - If cost data was available without the associated usage, Tesla used local unit costs to calculate usage.
 - District Heating usage data was collected from invoices obtained from third-party providers. If usage data was not available, Tesla estimated the usage by extrapolating the average consumption for the available months. If no data was reported, usage was based on sites in a similar geographic location and type of site.
- The WRI and WBCSD issued additional guidance for Scope 2 emissions in 2015 (in GHG Protocol Scope 2 Guidance, An Amendment to the GHG Protocol Corporate Standard), which sets forth reporting under both location-based and market-based methodologies, where the prior version of the GHG Protocol only addressed a location-based methodology. The location-based method applies average emission factors that correspond to the grid where the consumption occurs, whereas the market-based method applies emission factors that correspond to energy purchased through contractual instruments. Where contractual instruments were not purchased, the market-based emission factors represent either the residual mix, where available, or the location grid-average factors. This management assertion only includes Tesla’s location-based Scope 2 GHG emissions as Tesla is continuing to implement its processes to measure and report its market-based Scope 2 GHG emissions.

Management Assertion

Scope 1 & 2 GHG Emissions

GHG Emissions Disclosure

- Emission factors:
 - Electricity:
 - Canada: Environment Canada. 2023 National inventory report: greenhouse gas sources and sinks in Canada.
 - U.S.: U.S. EPA Emission Factors for Greenhouse Gas Inventories 2023.
 - Shanghai: Shanghai Municipal Bureau of Ecology and Environment 2022.
 - China: China Regional Power Grids 2022.
 - All other countries: International Energy Agency (IEA) Emissions Factors 2023.
 - District Heating: U.S. EPA Emission Factors for Greenhouse Gas Inventories 2023.
- Estimated emissions from the source above account for approximately 8.8% of Scope 2 GHG emissions.

Feedback on This Report

Tesla aspires to do the right thing, and we are constantly looking for ways to do better. If you have suggestions about how our company can improve in any way, feel free to send your ideas to impactreport@tesla.com.

The statements made in this report speak only as of the date on which they are made. We do not assume any obligation to update or revise any statements, whether as a result of new information, future events or otherwise, except as required by law.

