
Impact Report
'24



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

To learn more, view the Extended Version

Everything we do is in support of our mission

Since our founding in 2003, Tesla has been focused on having a positive impact on our world by replacing fossil fuel-powered products across the transportation and energy industries with cleaner—and safer—alternatives.

We create products that are sustainable, and we work tirelessly to integrate sustainability into each step of our value chain, from responsible sourcing and manufacturing to our products' inherent sustainability and end-of-life circularity. Our product offering has expanded from sports cars to include sedans, SUVs and trucks as well as electric vehicle charging, solar panels and energy storage for homes, businesses and the grid.

Now we are further accelerating our mission—and impact—through autonomy. Enhancing our products with artificial intelligence, such as with our autonomous vehicles and robots, increases their utilization, makes them more efficient and safer to use while increasing access and further reducing emissions.

We are also focused on preparing our workforce for a sustainable future through training, meaningful career pathways and employee retention programs.

Creating a safer, cleaner, more enjoyable world

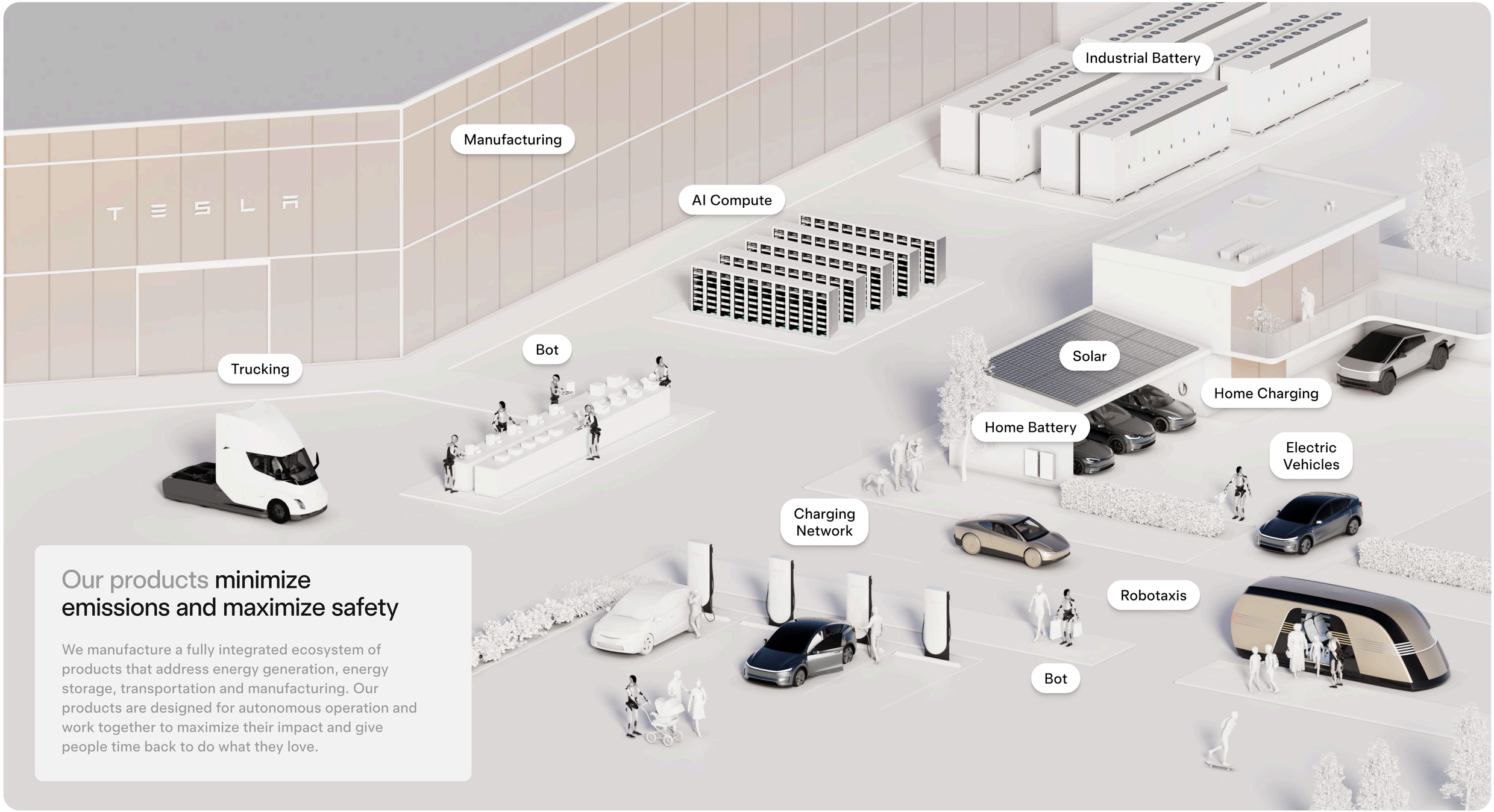
Pollution emitted during the burning of fossil fuels leads to 8 million premature deaths globally each year. That accounts for one in five premature deaths worldwide. Our zero direct-emission products contribute less climate-warming carbon and less fine particulate pollution into the Earth's atmosphere.

Each year, about 1.19 million people die in traffic accidents globally, with traffic injuries being the leading cause of death for children and young adults between the ages of 5 and 29.

We believe autonomy will save lives, time and money while improving quality of life for everyone. Autonomous transportation will make our roads safer for drivers, passengers and pedestrians alike.

Optimus, our autonomous humanoid robot, will give people back more time to do impactful work and enjoy their lives by automating time-consuming, unsafe and repetitive tasks at work and in the home.





Our products minimize emissions and maximize safety

We manufacture a fully integrated ecosystem of products that address energy generation, energy storage, transportation and manufacturing. Our products are designed for autonomous operation and work together to maximize their impact and give people time back to do what they love.

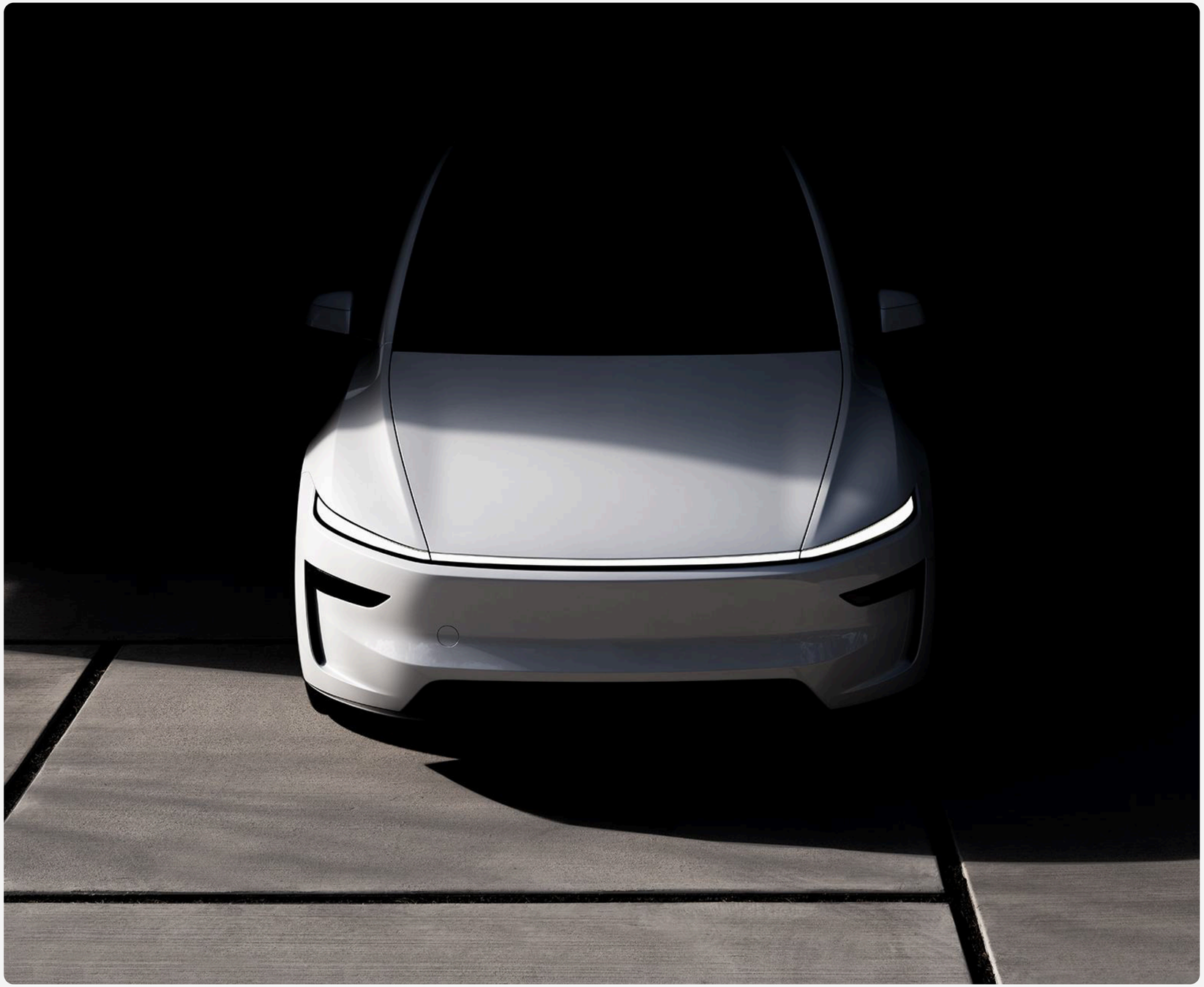


32M

In 2024, our customers avoided releasing nearly 32 million metric tons of CO_2e into the Earth's atmosphere by using our products—a 60% increase compared to 2023.

This number will continue to grow as we produce and deliver more products to customers around the world and increase their utilization through autonomy.





We strive to achieve net-zero GHG emissions

Our goal to reach net-zero emissions includes our products' supply chain, manufacturing, use and end-of-life. Today our avoided emissions are the most important metric for Tesla to measure, but our goal is to achieve net-zero emissions across our product lifecycles over time. We aim to make our operational electricity load 100% renewable before reaching our net-zero emissions target. We also match our Supercharger network's electricity use with renewable electricity, reducing our and our customers' GHG emissions for four years in a row.



CO_2e

100%

Our Supercharger network has been powered by 100% renewables for four years

100%

Gigafactory Berlin-Brandenburg has been powered by 100% renewable electricity for two years

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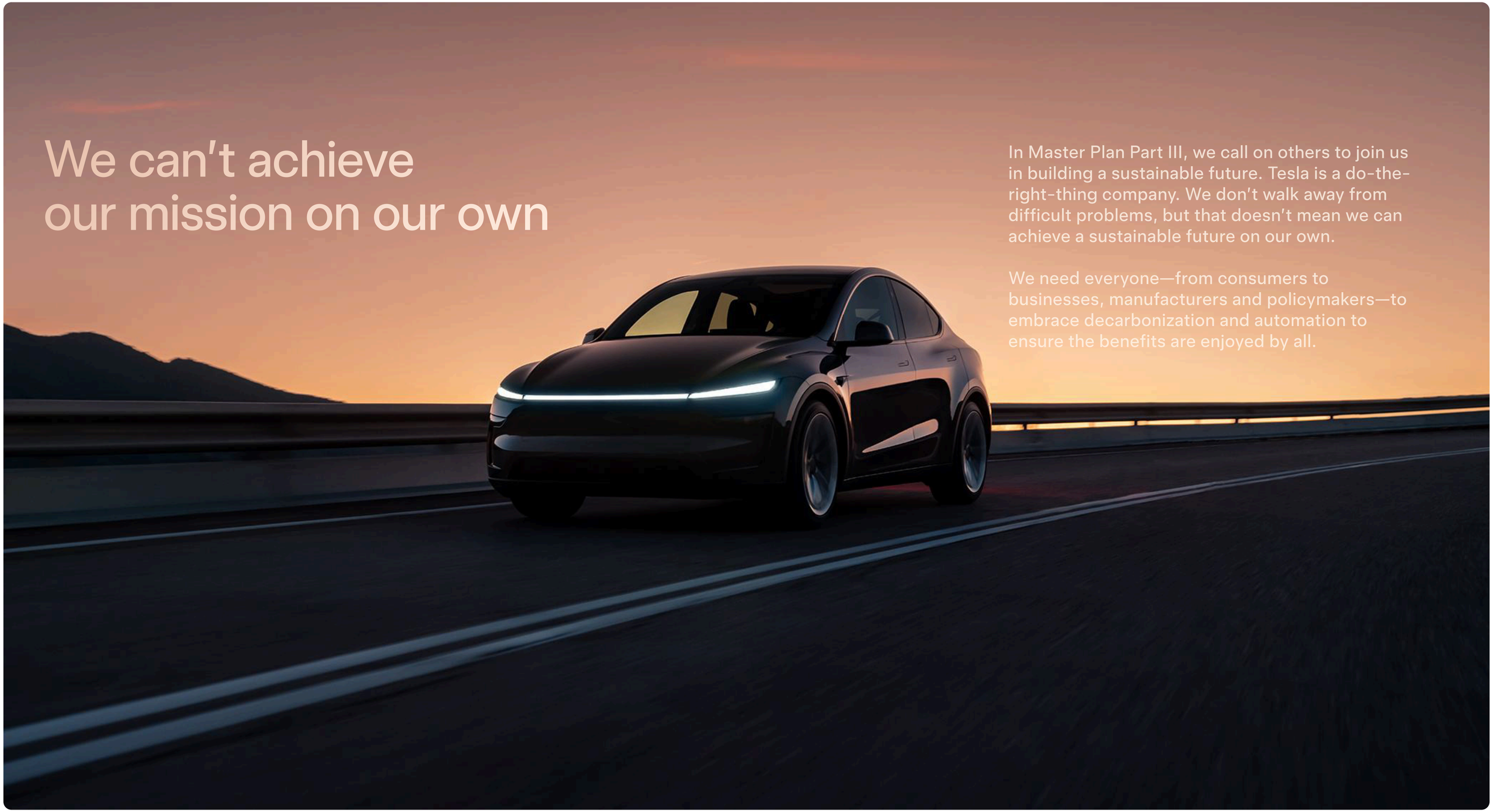
Charging EVs becomes more sustainable over time as electricity generation becomes cleaner. By comparison, the carbon impact of ICE vehicles remains the same every year of use.

We can't achieve our mission on our own



In Master Plan Part III, we call on others to join us in building a sustainable future. Tesla is a do-the-right-thing company. We don't walk away from difficult problems, but that doesn't mean we can achieve a sustainable future on our own.

We need everyone—from consumers to businesses, manufacturers and policymakers—to embrace decarbonization and automation to ensure the benefits are enjoyed by all.



Our Products

We're creating a world where sustainable, safe and reliable transport and energy is available to all

01

Our mission starts with making our products as affordable, safe and fun as possible

To achieve our mission, we must sell as many of our products as possible. Many people are unlikely to purchase a product just because it has low lifetime emissions. For mass adoption, our products need to be better than their alternatives in every way: more affordable, safer and more fun.

We are not just trying to build sustainable products—we are committed to building the best products, period. We offer our owners a full ecosystem of products and services to ensure they have the best experience possible—from purchase to delivery, and from charging to service.

To learn more, speak with a Tesla Advisor



CO_2e

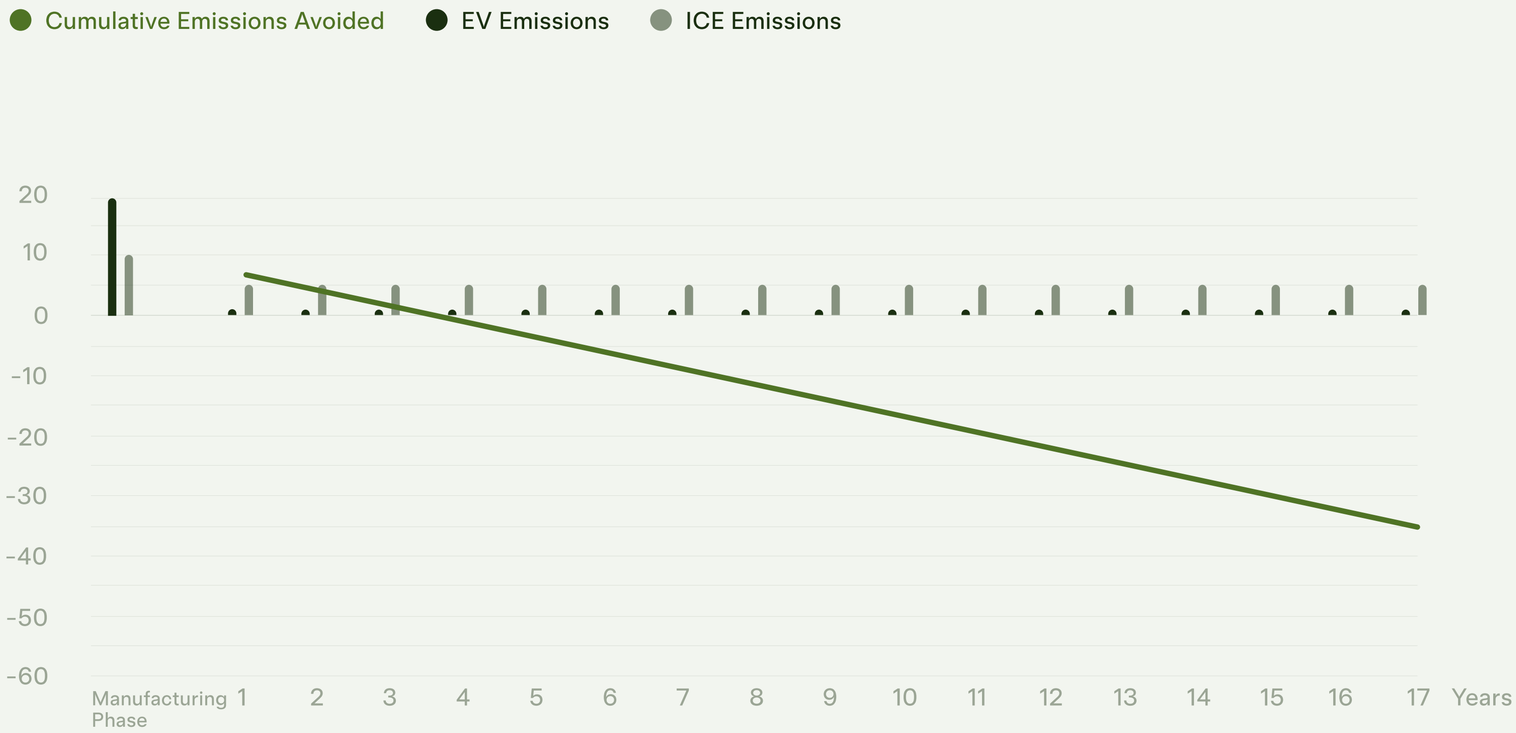
35

metric tons of CO_2e avoided by each Tesla on the road after 17 years

In the U.S., a Tesla vehicle avoids even more with an average of 52 metric tons of CO_2e avoided. Charging an EV is also becoming more sustainable over time as electricity generation becomes cleaner. By comparison, the carbon impact of ICE vehicles remains the same every year of use.

Emissions Avoided by a Tesla Vehicle Over Its Lifetime

(Global; mt CO_2e)



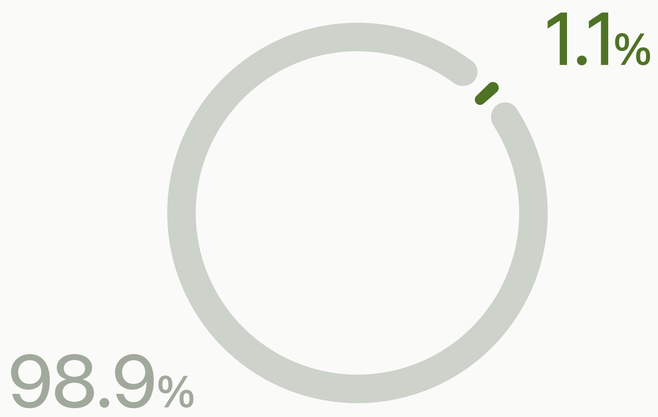
This year, we updated our avoided emissions calculation methodology using a global model with more primary GHG emissions data collected from our suppliers.

Electrifying industrial transport with our Semi is critical to our mission

Much like our approach to passenger vehicles, we will begin addressing emissions in industrial transport by ramping production of Semi in late 2025.

Percent of U.S. Vehicle Fleet

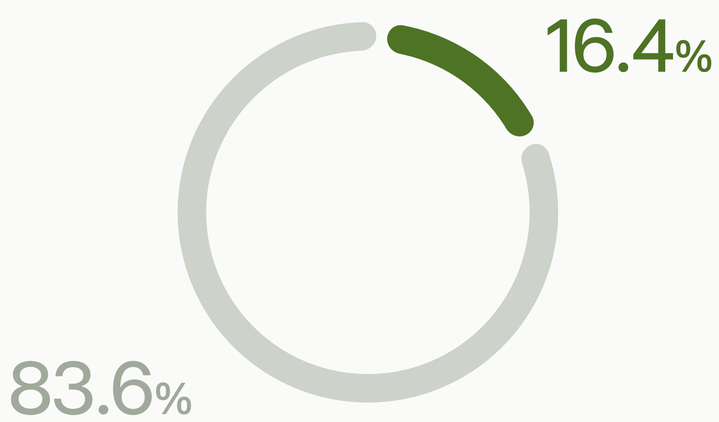
Rest of Fleet Combination Trucks



Industrial transport vehicles make up only 1% of vehicles on the road.

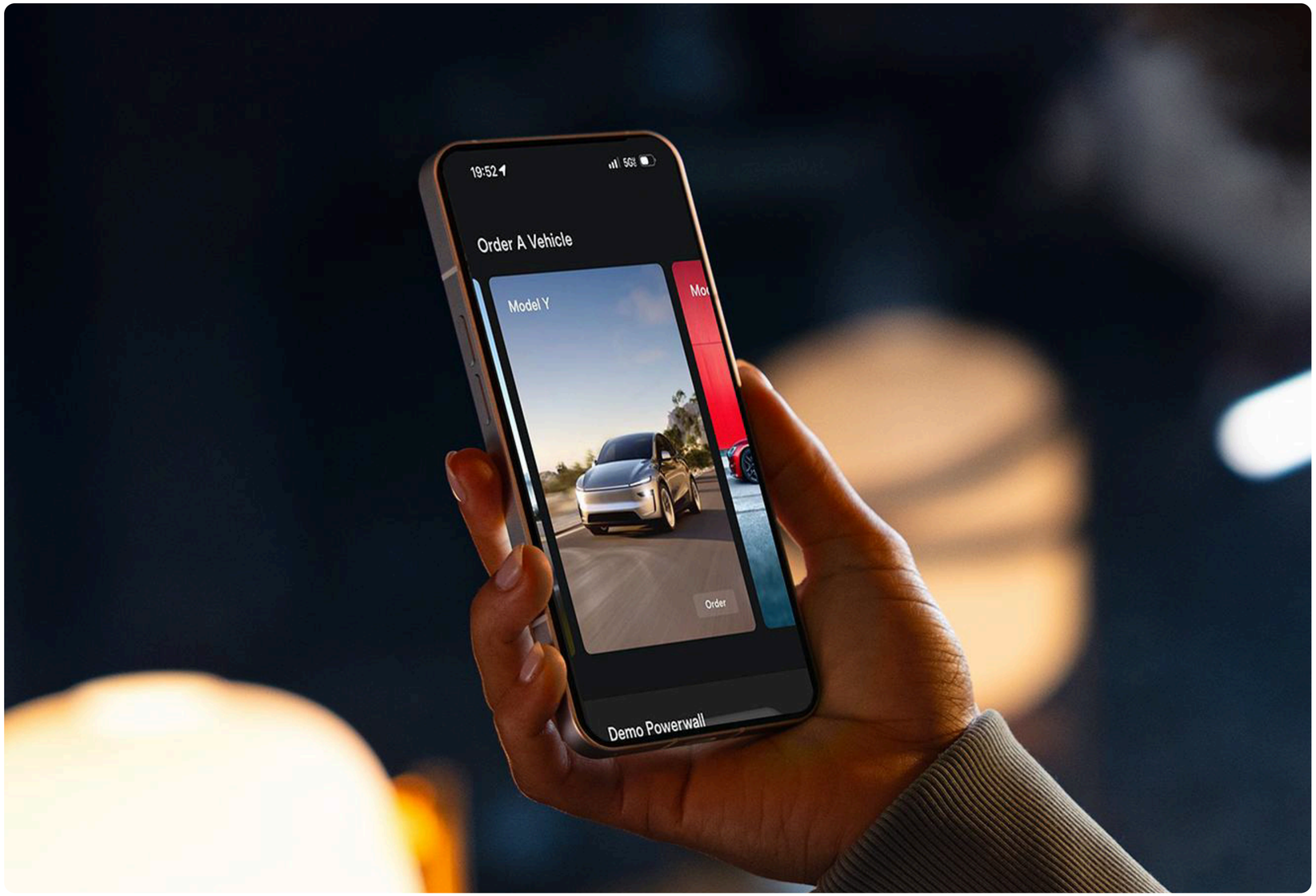
Percent of U.S. Vehicle Emissions

Rest of Fleet Combination Trucks



Industrial transport vehicles contribute 16% of all emissions in the U.S.

We make buying and owning a car as easy as possible



We aim to delight our owners at every step of their journey with us, so we redesigned the purchasing experience from the ground up. On day one, we invite customers into our product ecosystem with a direct-to-customer sales experience, which offers transparent pricing information and uses our proprietary technology to make the frustrating and boring parts of buying a car (including financing and insurance) as quick and simple as possible.

This digitized experience does not end at purchase—charging, service and upgrades can all be handled in the Tesla app.

Connect with a Tesla Advisor to learn more.

Our products get better over time

Tesla has led the adoption of over-the-air software updates in vehicles—something very few vehicle manufacturers are able to offer even today. With these remote updates, we are able to deliver the same convenience and functionality to your vehicle that you get from your mobile device—improving your experience over time. Everyone who purchases a Tesla vehicle can access new functionalities and features in their vehicle over its lifetime—for free—without needing to visit a Service center. Additionally, given the connected nature of our products, we can proactively identify any issues and address them remotely via an OTA or recommend a visit to a service center, when needed.

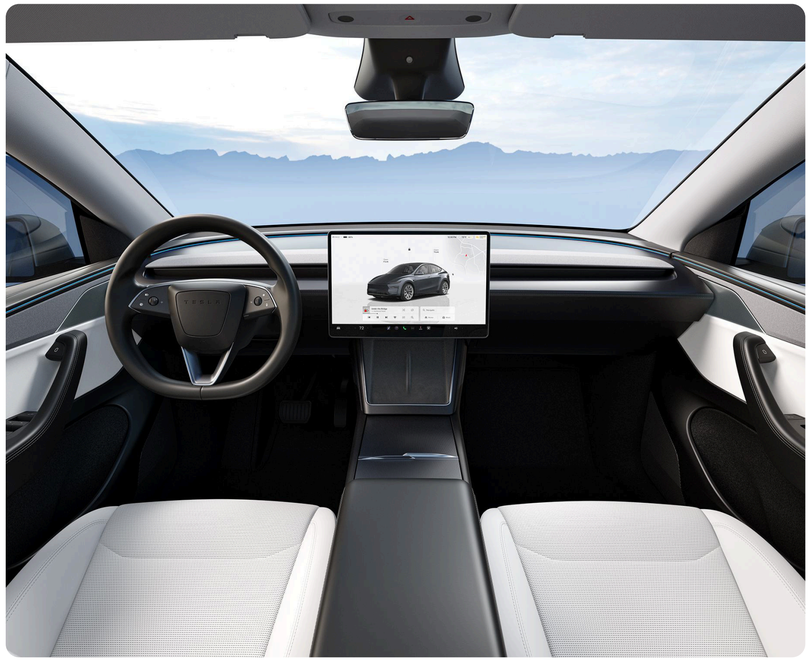
Tesla vehicles produced since 2012 can receive over-the-air software updates, which includes improvements like increased range through battery management optimization, better thermal management in cold-weather, new features like Sentry Mode and more.

Over-the-Air Software Updates Deployed

(2024)

250+ new or updated features deployed to owners globally

99% of recalls reported in 2024 resolved through over-the-air updates



Our drivers have the freedom to go anywhere

Average Uptime of Supercharger Sites

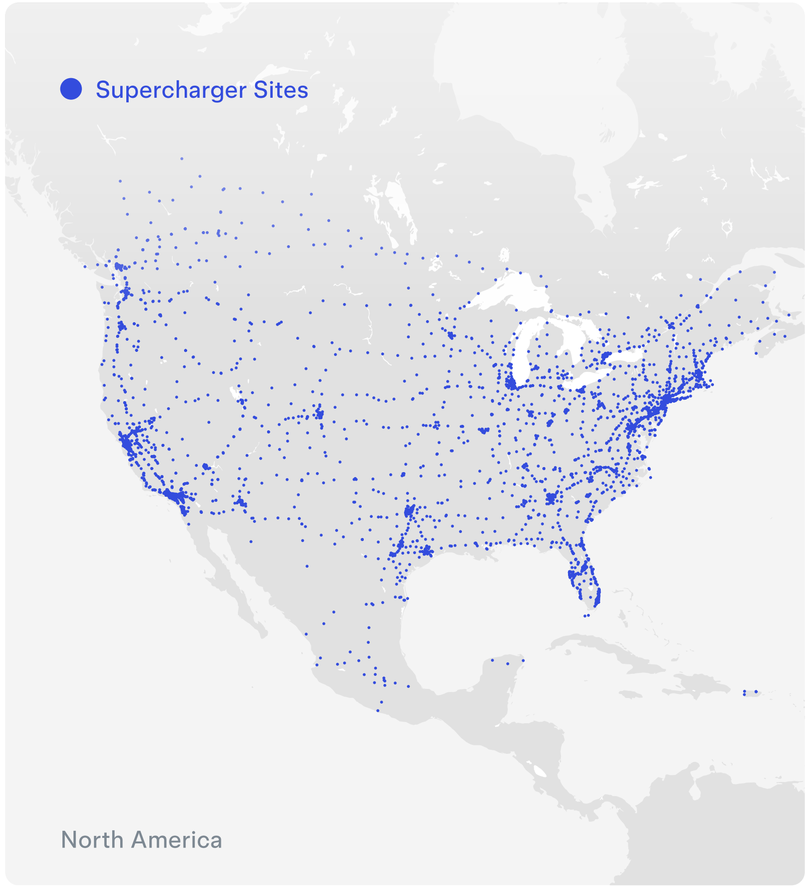
2024

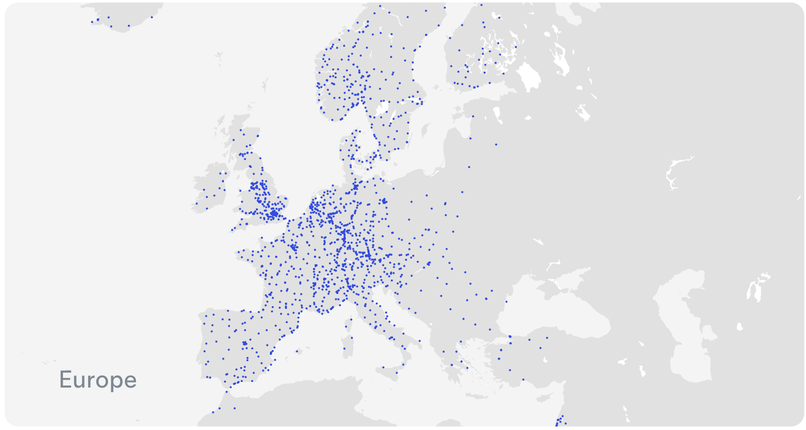
99.95%

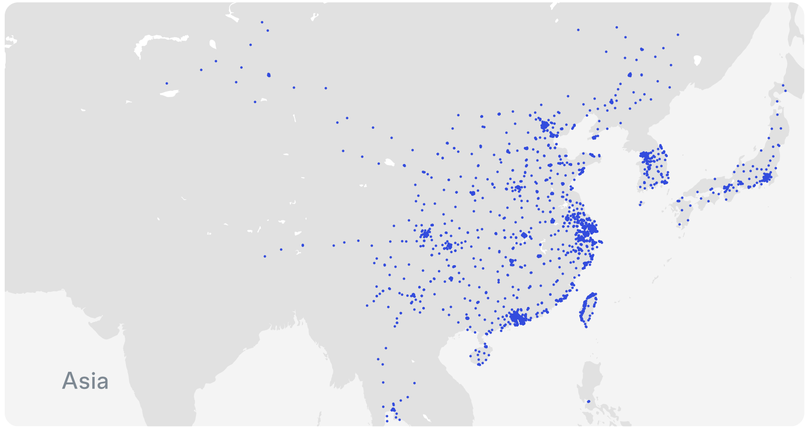
2023

99.97%

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







Exceeding safety standards across four continents

	NHTSA	IIHS HLDI	EURO NCAP	ANCAP SAFETY	C-IASI 中国保险汽车安全指数	TNCAP Taiwan New Car Assessment Program
Model 3	★★★★★ 2018	2022 IIHS TOP SAFETY PICK+ 2022	★★★★★ 2025	★★★★★ 2025	Top Rating Occupant Safety Active Safety 2021	★★★★★ 2025
Model Y	★★★★★ 2020	2024 IIHS TOP SAFETY PICK+ 2024	Best in Class ★★★★★ 2022	Top Performer ★★★★★ 2022	Top Rating Occupant Safety Pedestrian Safety Active Safety 2021	★★★★★ 2025
Model S	★★★★★ 2013		Best in Class ★★★★★ 2022	★★★★★ 2014		
Model X	★★★★★ 2017		Best in Class ★★★★★ 2019	Top Performer ★★★★★ 2019		
Cybertruck	★★★★★ 2024					

We set a high standard for fire safety

Vehicle Fires per Billion Miles Driven

(2023)

Tesla

6.5

United States

55.0

Ensuring that the risk of fire is as low as possible for electric vehicles and energy storage products is critical for their mass adoption. Safety is integrated into everything we do, and we continue to review, test and update our safety requirements and procedures ahead of industry standards. Our latest data shows that vehicle fires are eight-times less likely for Tesla vehicles than the U.S. average.



Autopilot technology is nearly 10-times safer than a human driver

Autopilot technology includes the hardware and software necessary to operate active safety features, Autopilot and Full Self-Driving (Supervised). As of 2024, Tesla drivers using Autopilot technology (with active driver supervision) achieved a safety record nearly 10-times higher than the U.S. national average across all automobile makers and models.

We expect to replicate and accelerate this level of safety with the continued development of Autopilot technology, including our unsupervised autonomy features, which we plan to launch in 2025.

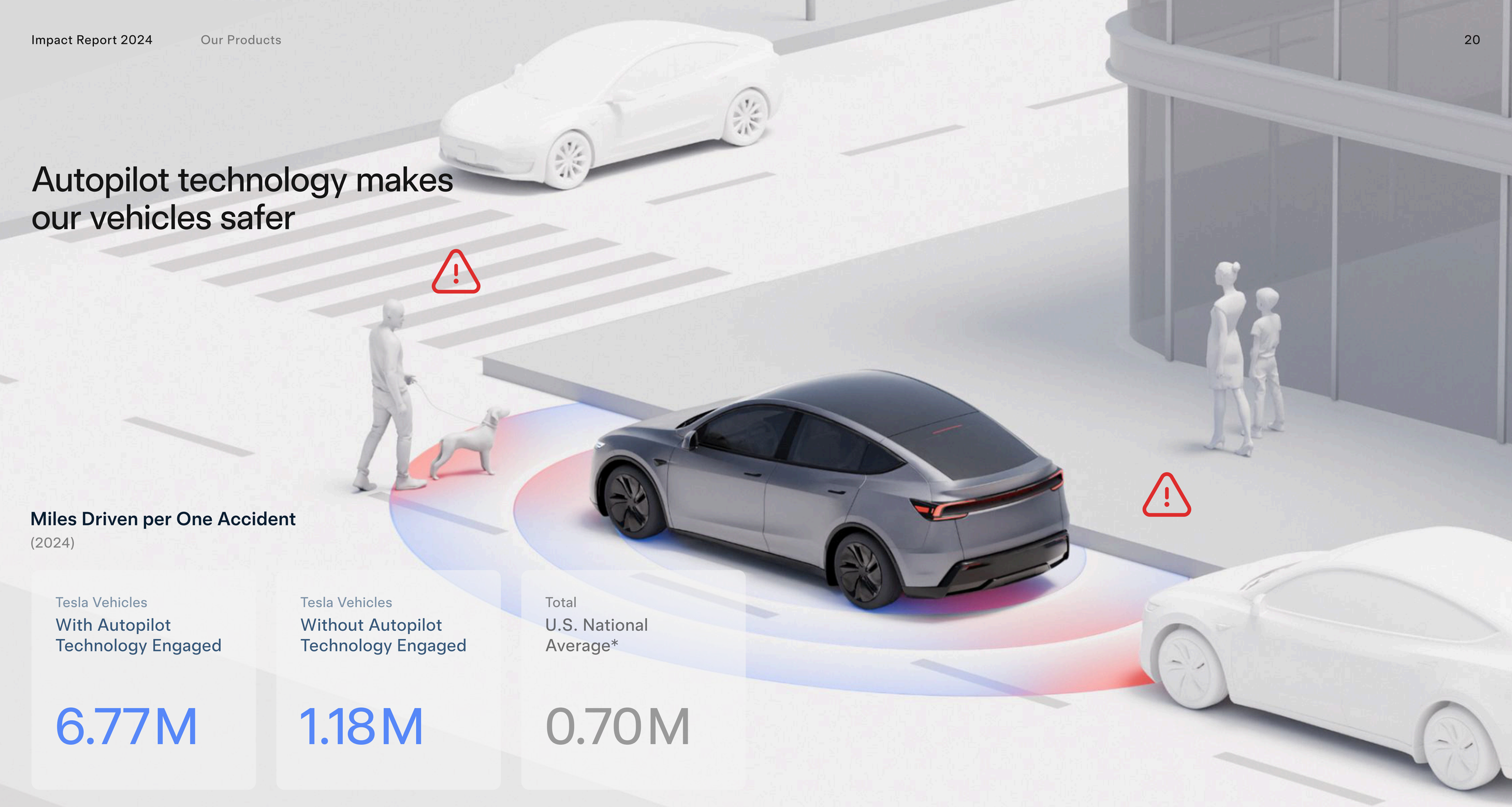
To learn more, view our Vehicle Safety Report







Autopilot technology makes our vehicles safer



Miles Driven per One Accident

(2024)

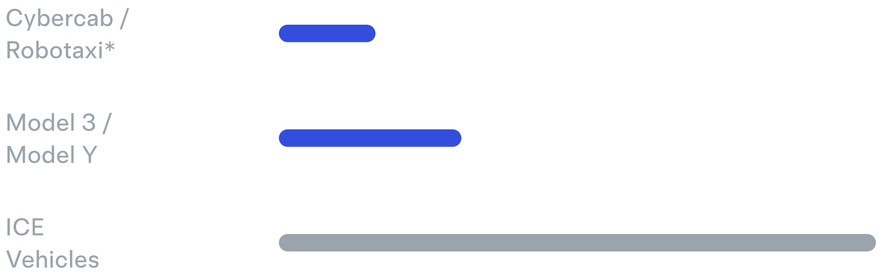
Tesla Vehicles With Autopilot Technology Engaged	Tesla Vehicles Without Autopilot Technology Engaged	Total U.S. National Average*
6.77M	1.18M	0.70M

*Based on the most recent data available from NHTSA and FHWA (from 2023).

Our Robotaxi network will further accelerate our mission

Emissions per Mile

(U.S. gCO_2e/mi)



Today, Model Y emits less than a third of the GHG emissions per mile of a comparable ICE vehicle driven in the U.S. With a more efficient drivetrain and fewer emissions resulting from the supply chain and manufacturing process, our Cybercab robotaxis are expected to emit about half the emissions of Model 3 and Model Y and nearly 85% less emissions per mile than the average ICE vehicle.

Robotaxi—powered by our Autopilot technology—will be far safer than a human driver and help increase road safety for all. Our Robotaxi network will not only lower emissions, but it will also increase the accessibility of sustainable transportation, thus improving the sustainability of our cities and accelerating our mission.



*Data shown is based on current product estimates.

We're making clean, safe and affordable transport available to everyone

Our vehicles come standard with premium features that create a driving experience rivaling that of luxury vehicles while maintaining a total cost of ownership in-line with that of mass-market, less-premium vehicles. With no oil changes or annual maintenance required, Tesla vehicles can cost less to maintain.

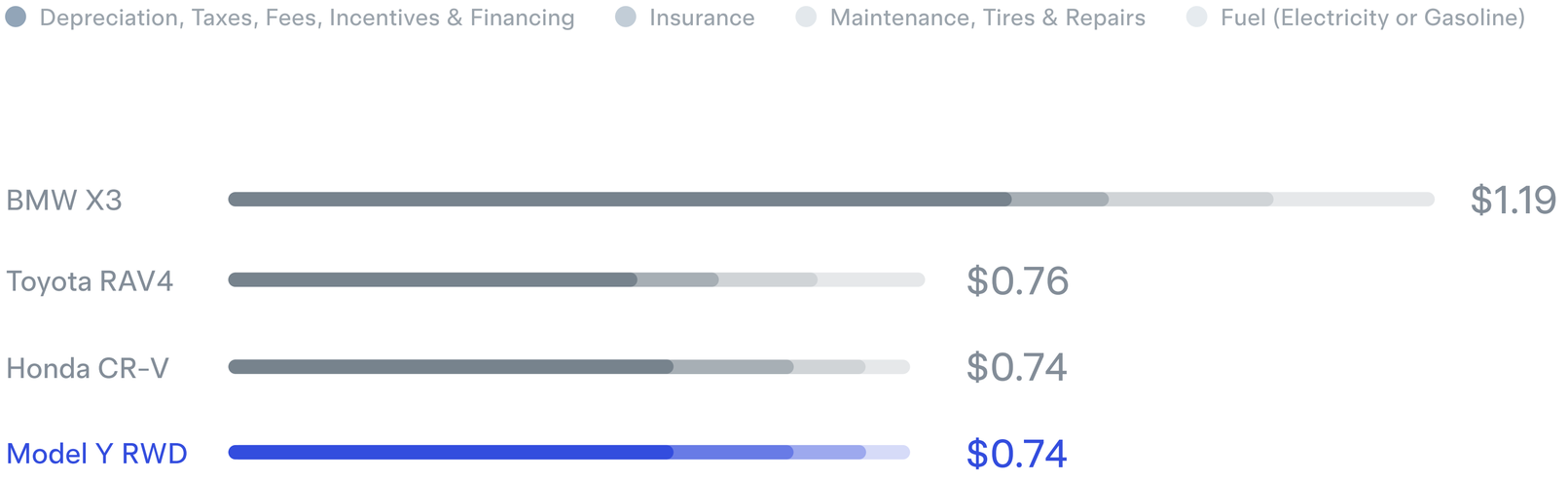
EVs are less expensive to fuel than gas-powered vehicles, and charging at home makes the experience more convenient. The cost of electricity to power Model Y is up to three-times less than the cost of gas for a comparable ICE vehicle.

Total Cost of Ownership ($ per Mile)

(5 Years and 60,000 Miles)

Model Y RWD

$0.74



Autonomy gives you time back to do what you love



People spend nearly two hours a day on chores

The impact of autonomy will be experienced on the road as well as in the home and factory. When utilizing autonomous transport, our customers will be able to use their time commuting to enjoy the ride instead of focus on the drive.

Optimus, our humanoid robot (which will automate boring, repetitive or unsafe tasks), will bring this same level of convenience into the home and workplace. This gives families and workers time to focus on more fulfilling or impactful activities.



Making clean energy reliable and affordable

We offer a full ecosystem of energy products including hardware, software and services, across generation and storage.

Our energy products provide backup power when the grid goes down, helping prevent outages while reducing emissions. Keeping the grid powered is essential to keeping our economy functioning.

Tesla Virtual Power Plants (VPP) utilize the energy stored in thousands of Powerwall units in people's homes throughout a given community to produce a network of on-demand energy that helps to avoid blackouts while compensating owners.

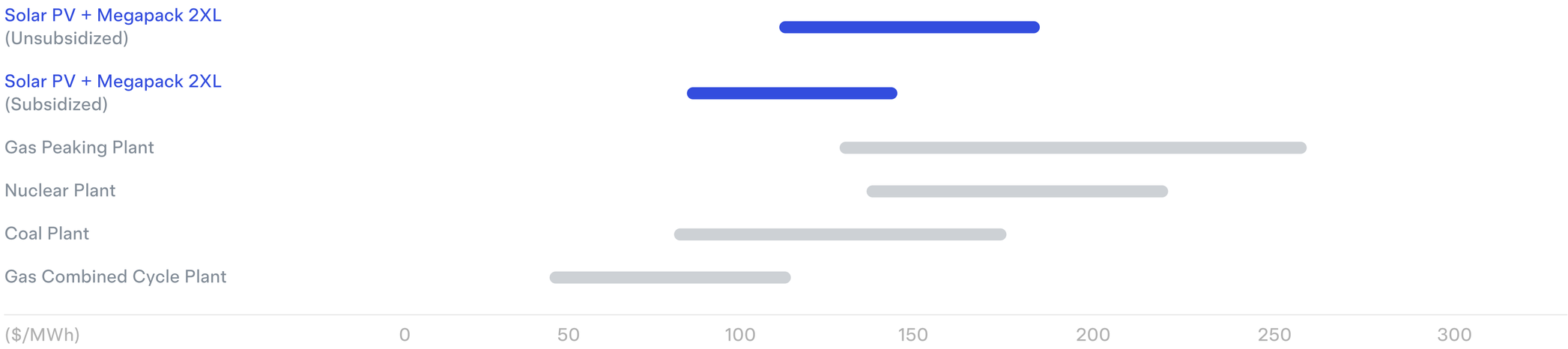
Megapack provides grid stability at a competitive price

As electricity demand grows, batteries add critical capacity and stability to the grid. Megapack – Tesla's grid-scale battery storage solution – helps to increase utilization of existing generation and transmission capacity, aligning periods of excess power generation with periods of peak electricity consumption, in a seamless and coordinated manner, resulting in a more efficient use of the electric grid.

Additionally, when paired with solar PV, Megapack is cheaper per MWh than many fossil fuel alternatives. When considering the total cost of ownership, the long-term economics are more favorable thanks to lower maintenance costs, no fuel expenses and longer lifespans.

Levelized Cost of Energy Comparison for Megapack and Conventional Resources

($/MWh)



Grid stability in action

Tesla Virtual Power Plant (VPP)

In 2024, Tesla VPPs delivered 2.8 GWh of energy to the grid, supplied by over 100,000 enrolled Powerwall units globally—that is the equivalent of powering 742 Model Y vehicles for one year.

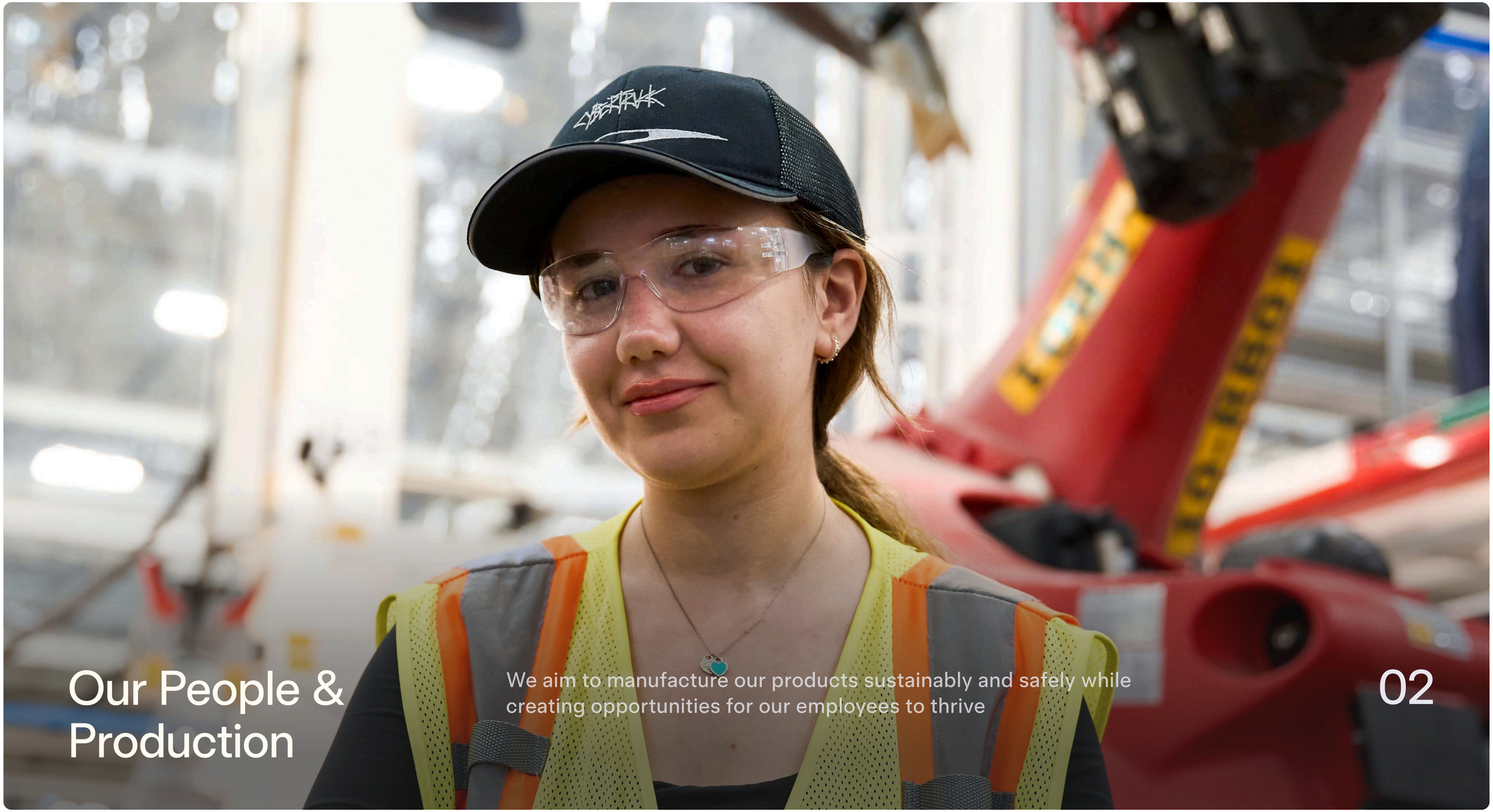
Puerto Rico's energy infrastructure faces regular weather-related grid disturbances. In 2024, Tesla's Puerto Rico VPP supported 7,112 Powerwall-enabled homes, contributing 444 MWh of energy to the grid and offsetting peak demand during summer heat waves.

Megapack Industrial Energy Storage

In Australia's National Electricity Market, 16 Megapack and Powerpack sites responded during contingency events in the fourth quarter of 2024, providing grid stability and avoiding blackouts.

Megapacks on Oahu supported the retirement of Hawaii's last coal plant. The Kapolei Energy Storage facility can support roughly 20% of the island's peak load and will reduce renewable energy curtailment by 69% over the next five years.





Our People & Production

We aim to manufacture our products sustainably and safely while creating opportunities for our employees to thrive

02

Our mission extends to how we make our products

By the time our products reach our customers, we have worked with our suppliers and employees to ensure they were built as sustainably and safely as possible, minimizing resource use, waste and emissions while maximizing safety.



We build efficient factories

We design our factories to limit waste, water usage and energy consumption. With each new Gigafactory, we aim to find new ways to manufacture our products more sustainably. Where we can not reduce energy consumption, we source renewables as much as possible.

We integrate learnings from all our sites into the development of future sites and the enhancement of existing locations like Gigafactory Berlin-Brandenburg and Gigafactory Texas.

Natural gas reduction year-over-year

50%

natural gas savings year-over-year by melting and redirecting scrap metal back to castings at Gigafactory Texas

Waste disposal diversion

100%

of waste diverted from disposal at Gigafactory Shanghai in 2024

Clean energy procured

1GW

of wind and solar energy secured across North America and Europe since 2023

Preparing the workforce for a world powered by sustainable energy

As of 2024, Tesla has created over 125,000 clean energy-related jobs globally. We are committed to attracting, developing and investing in exceptional talent and supporting their growth, regardless of their background.

We invest in educational programming that inspires the next generation to pursue careers in clean energy and manufacturing. We also invest in trades training and believe you do not need a degree to contribute to our mission.



Creating pathways to careers in sustainable energy

Key Highlights

(2024)

4.65M

applications received

76%

of leadership promoted internally

Our workforce development programming is crucial to our success and to attracting the best talent. It is important for Tesla to create pathways for employees to cultivate the skills needed to prepare them for the opportunities created by the sustainable energy future.



Inspiring the next generation of Tesla leaders

Our education outreach programs and events aim to inspire young people to pursue STEM (science, technology, engineering and mathematics) careers by sparking curiosity and fostering creativity.

By increasing access to learning opportunities in underrepresented communities, we are preparing even more people for the careers of the future.

To learn more and apply, visit Tesla.com/Careers.

- Professional Internships
- Military Fellowship Program
- START (Manufacturing & Service)
- Apprenticeships
- Technician Trainee Program (Service)
- Introduce a Girl to Engineering Day
- Engineering Development Program
- Robotics Program
- Future Talent Program

We aspire to create a workplace where our employees can thrive

Our employees are critical to our mission. To sustain our pace of innovation, we work to retain a talented workforce by providing our employees with opportunities to contribute to our mission and grow professionally. We are committed to creating a workplace where 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, and support them with benefits that go beyond the standard of care.

To learn more, view our Extended Version



We strive to ensure the safest operations for our employees

We actively engage with our employees to identify safety risks before accidents occur and base our programming on three pillars: do the basics right, engage and empower stakeholders and reduce risk.

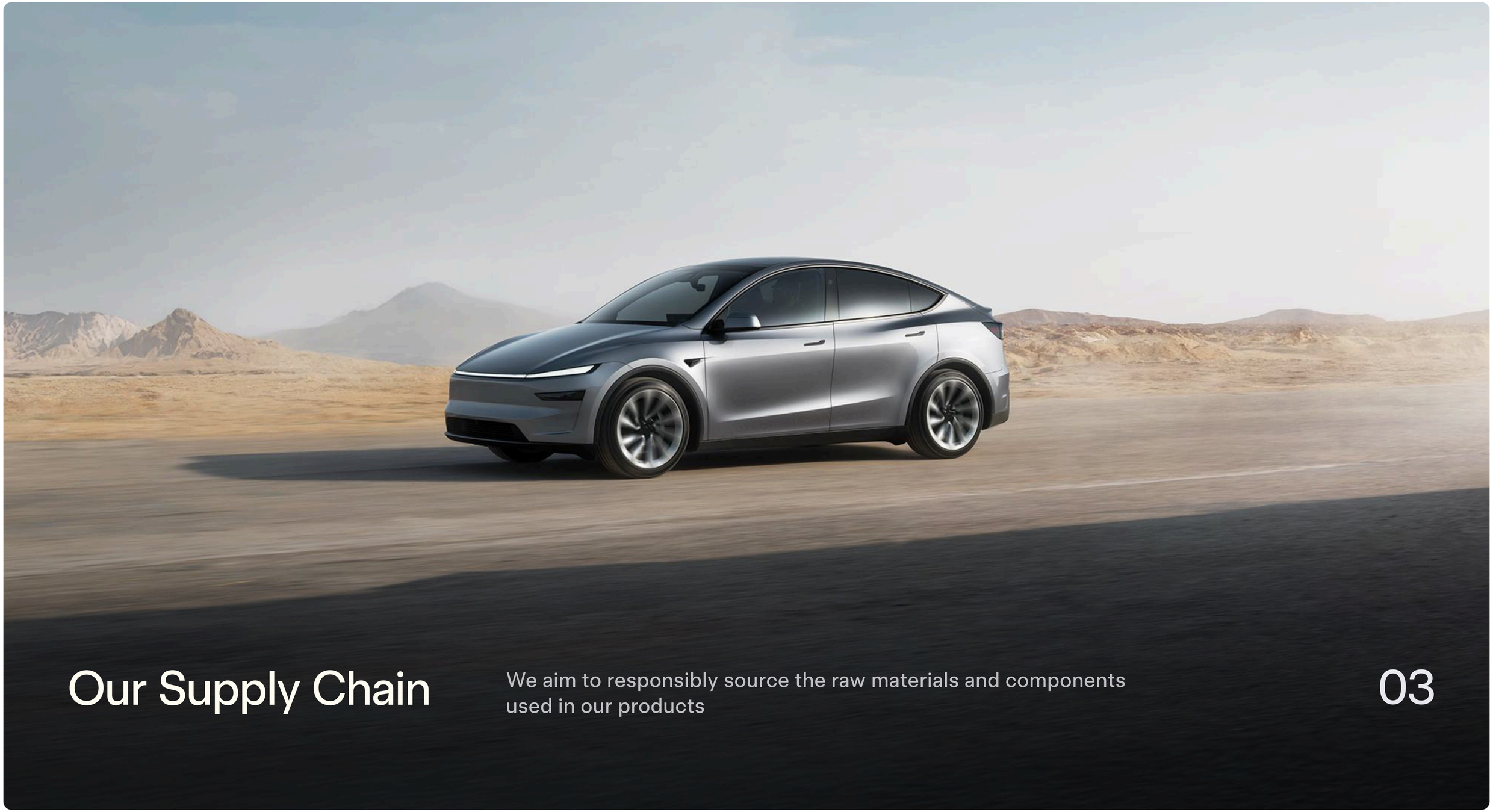
As we have increased employee engagement, we have seen our work-related injury rate come down over the same period.

Safety Improvement Suggestions by Employees Are Increasing

2021	49,000
2022	333,000
2023	660,000
2024	731,500

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

2021	3.57
2022	2.86
2023	2.51
2024	2.28



Our Supply Chain

We aim to responsibly source the raw materials and components used in our products

Achieving our mission through our sourcing

Tesla has positive impact on the world not only through the sustainability of our products, but also by making our supply chain more sustainable. Tesla is one of the largest EV and energy storage system (ESS) material buyers in the world. We use our purchasing power to avoid, prevent or mitigate any adverse impacts from our supply chain so that our sourcing supports a sustainable future.

We work directly with our suppliers to reduce the environmental and social impacts of our material sourcing, particularly in the most critical and impactful areas of our supply chain.





Minimizing the environmental impact of our supply chain

For the most GHG emission-intensive areas in our supply chain, we work directly with suppliers to develop on-site emissions reduction plans. These plans include advancing decarbonization efforts, increasing renewable energy usage and implementing more efficient processes.

77% of our battery materials suppliers set a net-zero or carbon-neutral goal

1ST EV manufacturer to launch a program to reduce the environmental impacts of nickel production in Indonesia

A sustainable energy economy requires less mining and raw material extraction

If the world follows Tesla's example and transitions to a fully electrified and sustainable economy, we could avoid extracting 18 gigatons of fossil fuels every year.

Once our economy has fully transitioned, we would only require three gigatons of battery material mining per year to replace mining for fossil fuels, reducing mining needs by 15 gigatons a year, on net.

Unlike fossil fuels extracted from the earth, battery materials can be recycled. This, over time, will reduce the need for additional raw material mining as we transition to a circular economy.

Current Annual Mining Extraction vs. Fully Sustainable Economy

(Gigatons)

● Fossil Fuel Extraction ● Sustainable Economy Materials (Peak Demand)

18Gt

Current Fossil Fuel Extraction

3Gt

Fully Sustainable Economy Materials Extraction



We respect human rights throughout our supply chain

Respecting human rights throughout our supply chain is a top priority at Tesla. We treat workers in our supply chain the same way that we treat our own employees. We take allegations of human rights abuses seriously and work diligently to uphold the right to freely chosen employment.

In 2024, we invested more human and legal resources than ever before to combat forced and child labor throughout our supply chain. We collaborate with our suppliers to remedy harms across our supply chain by using robust tools to identify and assess risks.

To learn more about our approach, view our Extended Version



Closing the loop with end-of-life recycling



Tesla is dedicated to establishing a circular value chain for our clean energy products. While ICE vehicles rely on single-use fossil fuels for power, recovered battery inputs like nickel, cobalt, copper and lithium can be reused to build new products. We work with industry partners to recycle battery scraps from our manufacturing lines and products once they reach the end of their life.

In 2024, we processed enough battery material through our recovery and recycling processes to manufacture the equivalent of around 21,000 Model Y RWD vehicles. As of today, these materials are diverted from landfills but are not always destined for the battery supply chain and may be downcycled into other industry applications when they do not meet the quality standards required for direct use. As recycling and refining capabilities continue to mature, consistent improvements in high-purity chemical refining are expected to minimize downcycling, enhancing the sustainability of the battery lifecycle.

Battery recycling key achievements

Batteries and the materials they are composed of are inherently recyclable, which allows for the recovery of valuable resources and the future reintegration of them into the production of new batteries. We are developing our own recycling capabilities to maximize the recovery of critical minerals from our battery packs, ultimately reducing the need to mine new materials over time.

Milestones

(2024)

5.3GWh

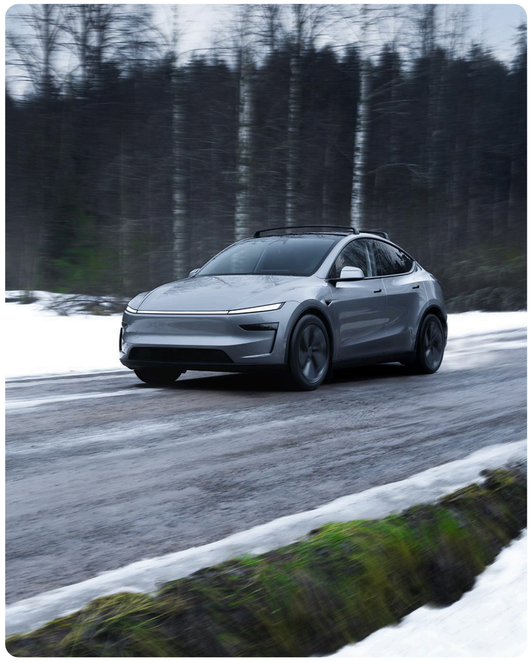
of battery materials sent to our recycling partners, which is enough for 64,000+ Model Y RWD vehicles

1.7GWh

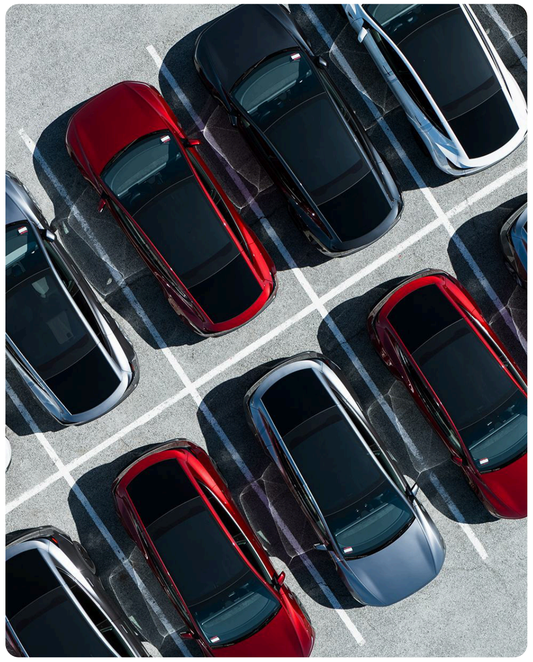
of battery materials processed at our battery processing facility, which is equivalent to around 21,000 Model Y RWD vehicles

590MT

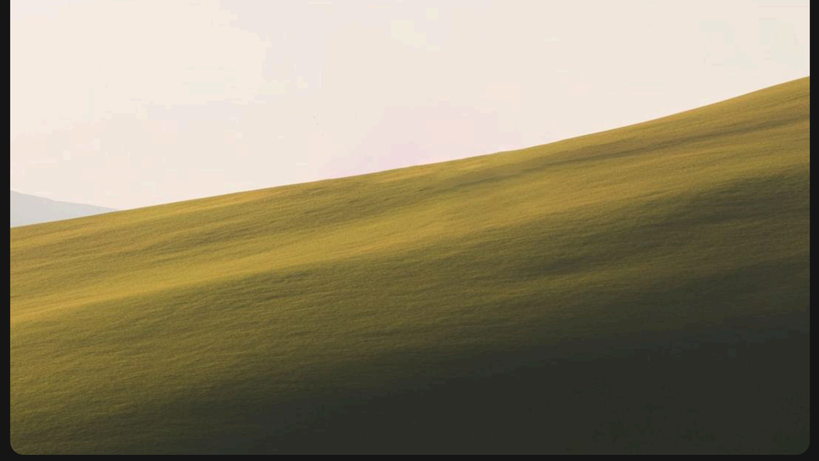
per month battery recycling throughput at Gigafactory Nevada in Q4 2024

















Our Future is Sustainable

We are building an autonomous world powered by solar energy, run on batteries and transported by electric vehicles.

Give us feedback at Impact@Tesla.com

Learn more at Tesla.com/Impact