

Impact Report 2022

A Sustainable Future is Within Reach

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

To accomplish this mission, we need to design products that are far superior to their fossil fuel counterparts in every way, source and manufacture them as sustainably as possible and sell as many of them as we can.

We believe the best way to do this is by offering an ecosystem of products that comprehensively addresses our world's clean energy generation, storage and transportation needs.

Every vehicle we sell, battery we install and solar panel we add moves the needle in the direction of a sustainable future.

Thank you to the Tesla team, customers and supporters for bringing us closer to our goal in 2022.

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01

Master Plan Part 3

A MESSAGE OF HOPE



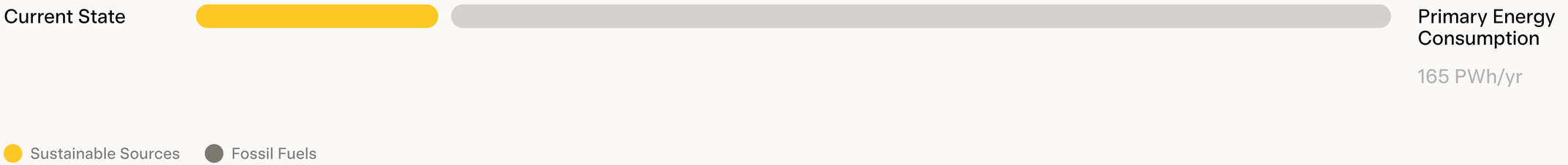
Today's energy economy is dirty and wasteful.



80% of global energy comes from fossil fuels

Today's energy economy is dirty. 80% of our energy comes from burning fossil fuels, which leads to rising global temperatures and CO_2 levels, as well as premature deaths from pollution.

Furthermore, the current energy economy is wasteful—with only **one third** of global energy produced delivering useful work or heat.



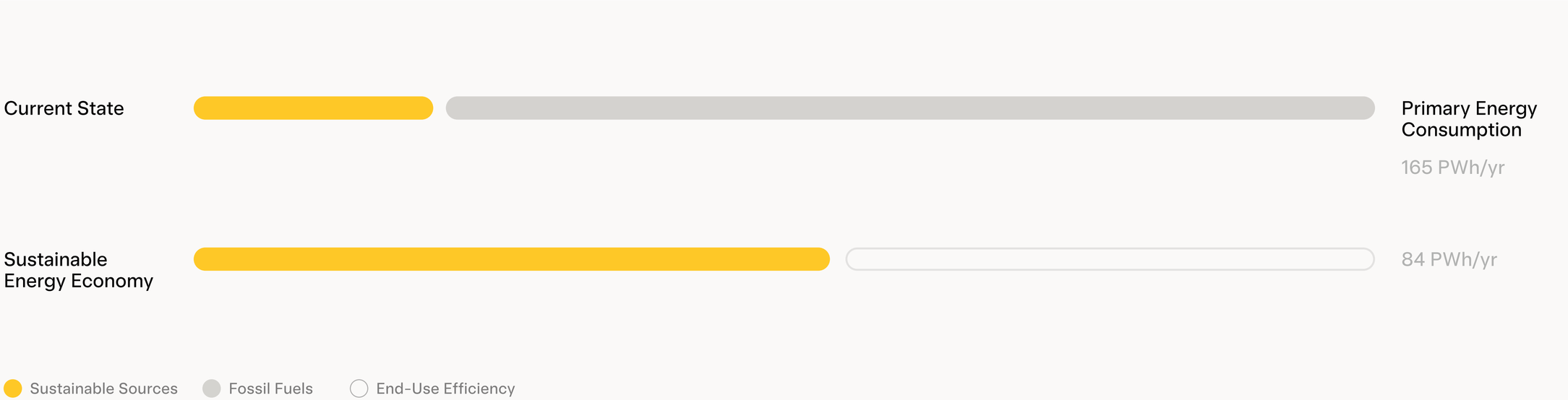
A sustainable future is within reach.



A sustainable energy economy requires 50% less total energy

Most people assume that an electrified civilization requires the same or more energy than a fossil fuel economy. That is not true.

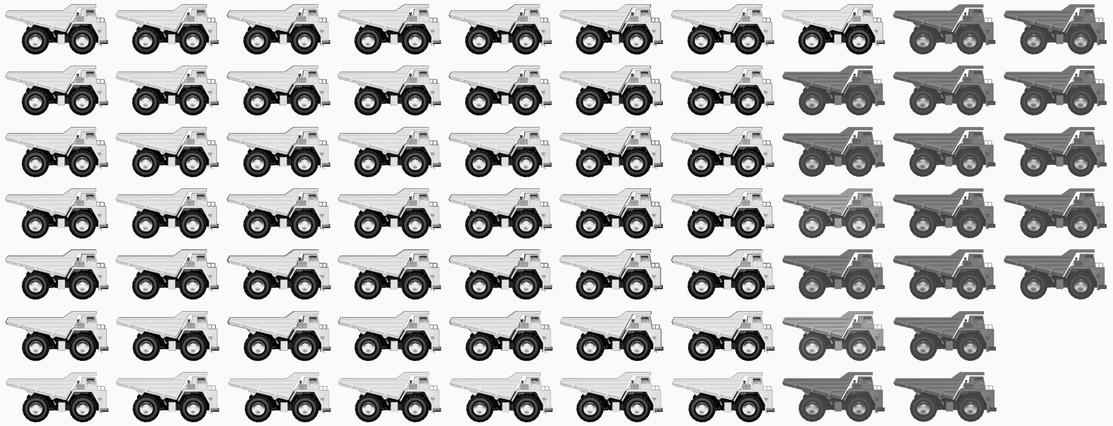
A sustainable energy economy is clean and far more efficient—requiring only half the primary energy of a fossil fuel economy.



The transition to sustainable energy will reduce global mining and extraction needs

Current Mining Extraction

= 1 Gigaton

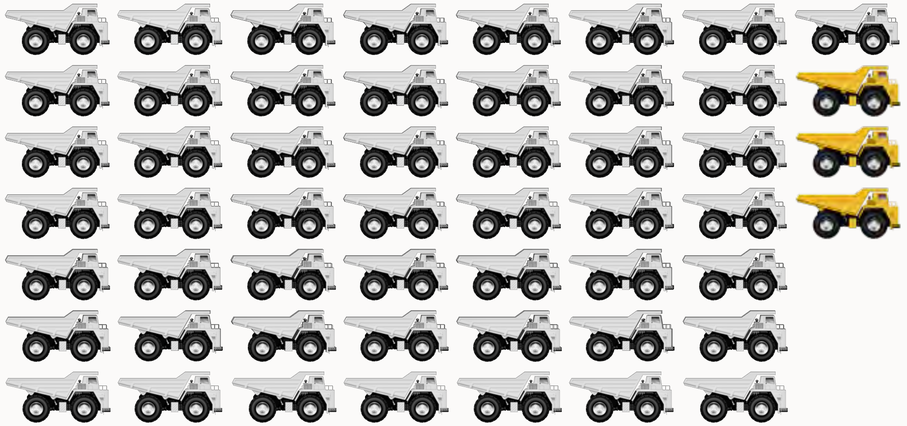


All Other Materials Mined

Fossil Fuel Extraction

Sustainable Economy Materials

Fully Sustainable Economy



Note: These are the minerals that we focus our responsible battery sourcing efforts on—particularly lithium, nickel and cobalt.

The investment required is manageable and achievable

Total land use, capital investment and resource requirements are achievable. Additionally, a sustainable energy economy actually requires less investment and less material extraction than continuing today's unsustainable path.



240 TWh
Storage



0.2%
Land area required



$10T
Manufacturing investment



Zero
Insurmountable resource challenges



30 TW
Renewable power

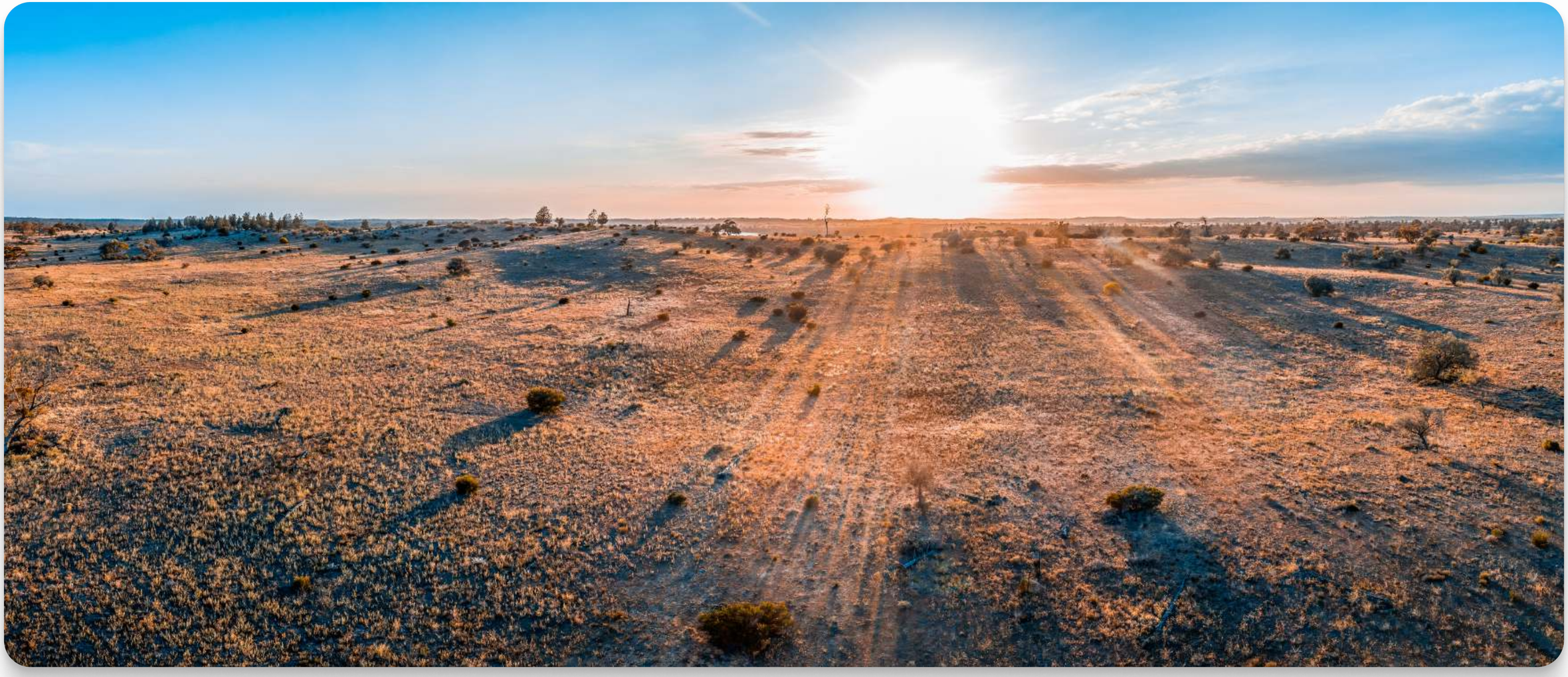


1/2
The energy required



10%
2022 world GDP

Only 0.2% of Earth's land area is required.



Beyond Tesla

While we are uniquely focused on accelerating the world's transition to sustainability, a full transition will require efforts far beyond Tesla. In Master Plan Part 3, we highlight five key areas that we believe can most dramatically advance the shift to sustainability.

A five-step plan to shift to sustainable energy

Including transportation, heat generation and industrial manufacturing



36%	22%	23%	13%	6%
Renewably Power the Existing Grid	Switch to Electric Vehicles	Switch to Heat Pumps	High Temp Heat Delivery & Hydrogen	Sustainably Fuel Planes & Boats

The path to 100% sustainability by 2050

To accomplish this five-step plan, the world's annual deployment of solar and wind and annual production of batteries will need to continue to grow. We believe these growth rates are achievable.

Solar & Wind Deployment (TW/yr)

3x increase

2022 Deployment	0.36
Required Deployment Per Year	1.0

Vehicle, Stationary & Thermal Battery Production (TWh/yr)

29x increase

2022 Deployment	0.54
Required Deployment Per Year	16

Electric Vehicle Production (Millions/yr)

11x increase

2022 Deployment	8
Required Deployment Per Year	85

Total solar, wind and battery installed base and investment needed

Solar & Wind Farms

30.4 TW

Renewable Energy Grid	10.6
Switch to EVs	4.8
Heat Pumps	4.8
High Temp Thermal	6.5
Planes & Ships	3.7
Total	30.4TW

Vehicle & Stationary Batteries

240 TWh

Renewable Energy Grid	22.9
Switch to EVs	115.7
Heat Pumps	6.7
High Temp Thermal	49.9
Planes & Ships	44.4
Total	239.6TWh

Manufacturing Capex

$10T

Renewable Energy Grid	0.8
Switch to EVs	7.0
Heat Pumps	0.3
High Temp Thermal	0.8
Planes & Ships	1.0
Total	$10.T



02

Environmental Impact

THE FUTURE IS ELECTRIC



Displacing Fossil Fuels
19-25

Carbon Impact of Our Products
26-39

Carbon Impact of Our Operations
40-49

Water and Waste
50-58









13.4 Mmt
of CO_2e emissions avoided

100%
renewable Supercharger network

-30%
Greenhouse gas emissions per vehicle

-15%
H_2O per vehicle

90%
of manufacturing waste recycled

2.1 Displacing Fossil Fuels

We make products that displace fossil fuel alternatives.



Air pollution from burning fossil fuels leads to premature deaths

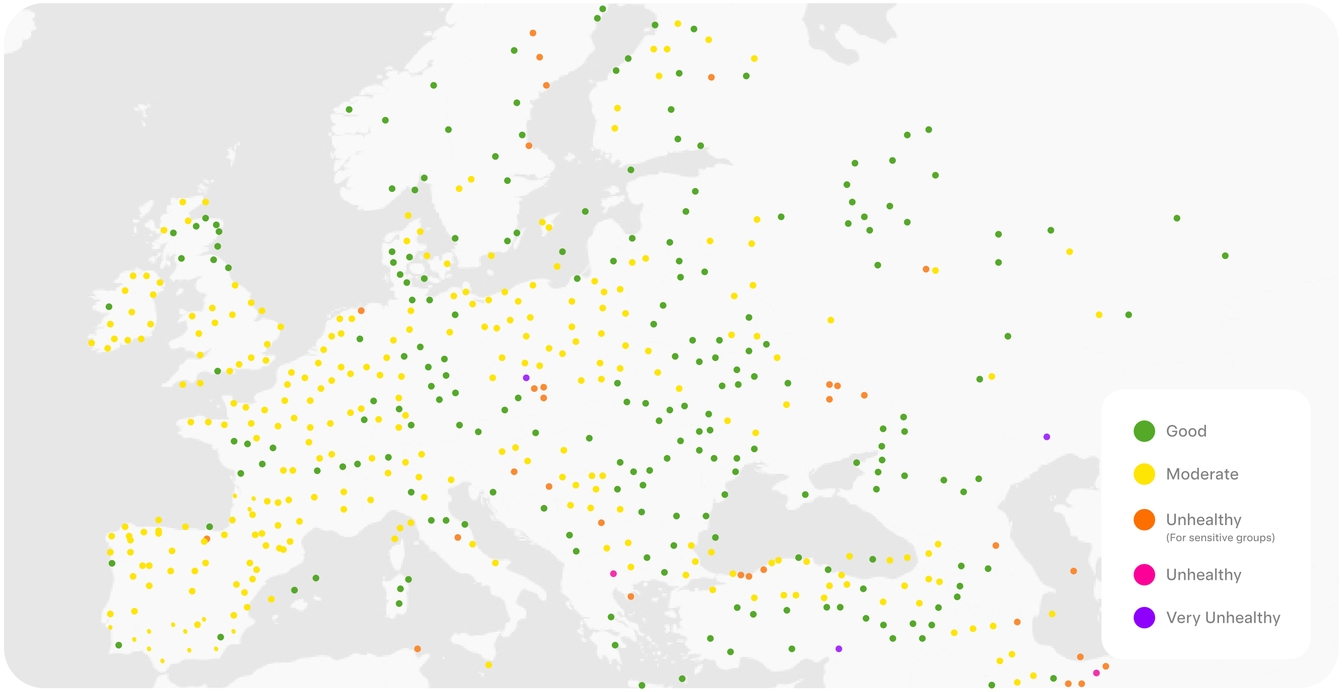
Pollution from burning fossil fuels leads to eight million premature deaths globally each year. That accounts for one-in-five premature deaths worldwide.

This is a major advantage of zero-emission products that is often forgotten. Our products are not just about the future of our planet, but also about addressing preventable deaths today.

Note: According to recently published research in Environmental Research by Harvard University, in collaboration with the University of Birmingham, the University of Leicester and University College London, air pollution causes over eight million premature deaths annually.

Fine Particulate Air Pollution in Europe (2023)

Source: waqi.info



Tesla produced and delivered over 1.3 million EVs globally in 2022

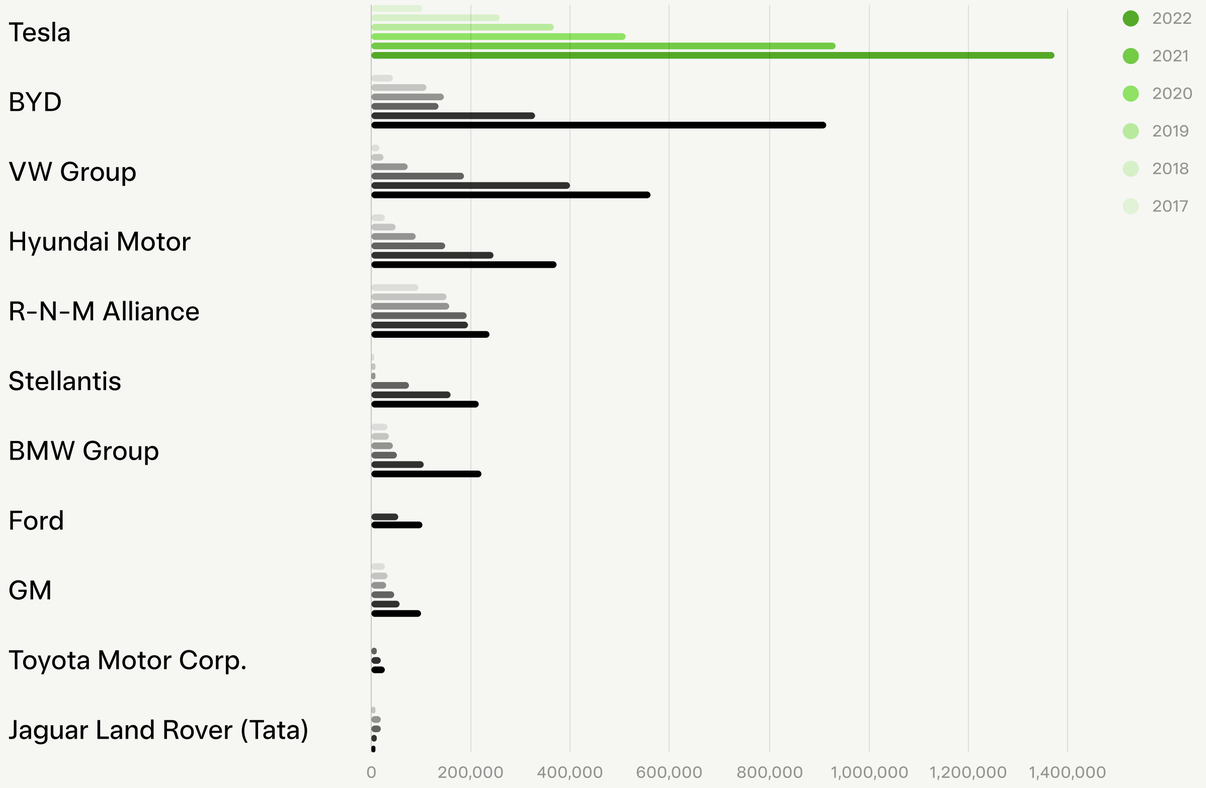
Although we are focused on our own deliveries, electric vehicle (EV) sales by all carmakers need to increase. We hope that every vehicle manufacturer will strive to produce hundreds of thousands of EVs per year, as significant reductions in emissions will only be achieved with an industry-wide shift.

Emissions credit revenue is used for EV capacity expansion, which in turn displaces internal combustion engine (ICE) vehicles. In 2022, we generated almost $1.8 billion in revenue selling zero-emission regulatory credits to other original equipment manufacturers (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.

Electric Vehicles Produced

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.



A single Tesla vehicle avoids 55 tons of CO_2e over its life

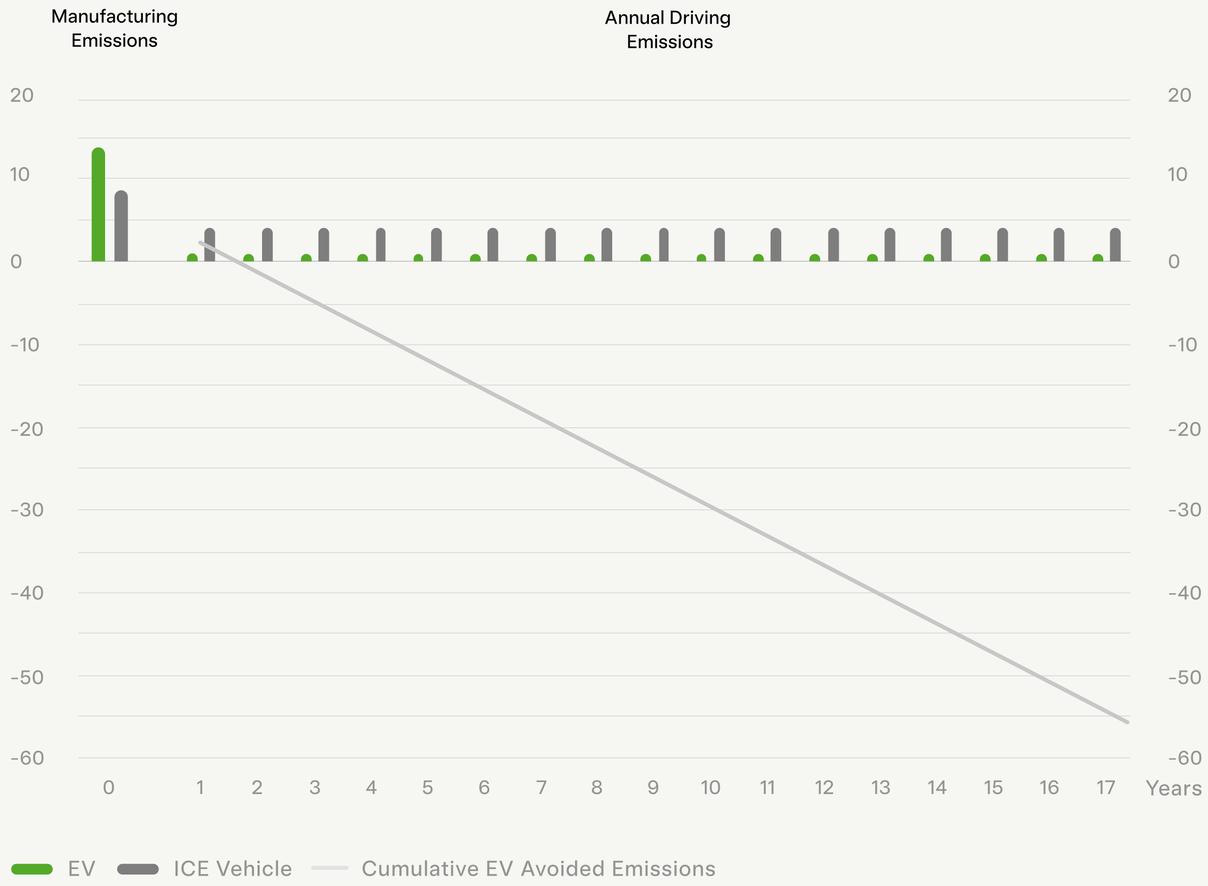
After approximately two years of driving, an EV's lifetime emissions are lower than an ICE vehicle's.

While EVs today still emit more greenhouse gases (GHGs) during the manufacturing phase, including emissions from the supply chain, it takes less than two years' worth of driving before the total emissions from an EV 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 almost 55 tons of CO_2e.

This number is conservative for two reasons: it assumes no improvement in grid emissions over time and that an ICE vehicle maintains its fuel efficiency throughout its life.

EV Emissions Impact Over Time (U.S.; mt CO_2e)



Current frameworks weren't built for a company like Tesla

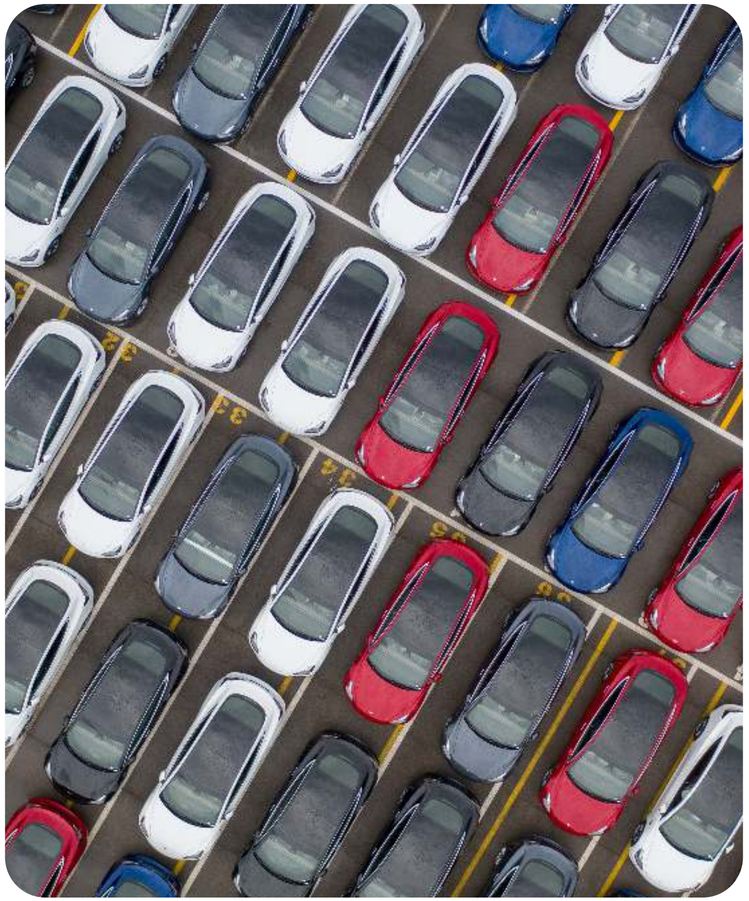
The popular frameworks for measuring and reducing GHG emissions were written by and developed for well-established companies with polluting products. These frameworks do not account for the impact of emissions that are avoided through the sale of zero-emission or clean-tech products. By the end of the decade, Tesla will need to build many more factories with the goal of ultimately producing 20 million vehicles and over 1,000 GWhs of energy storage per year. Each one of these products will avoid many tons of CO_2e throughout its life.

Tesla plays a critical role in achieving global commitments for electrification in the energy and transportation sectors through the sale of our products. Even as Tesla constructs the most 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.

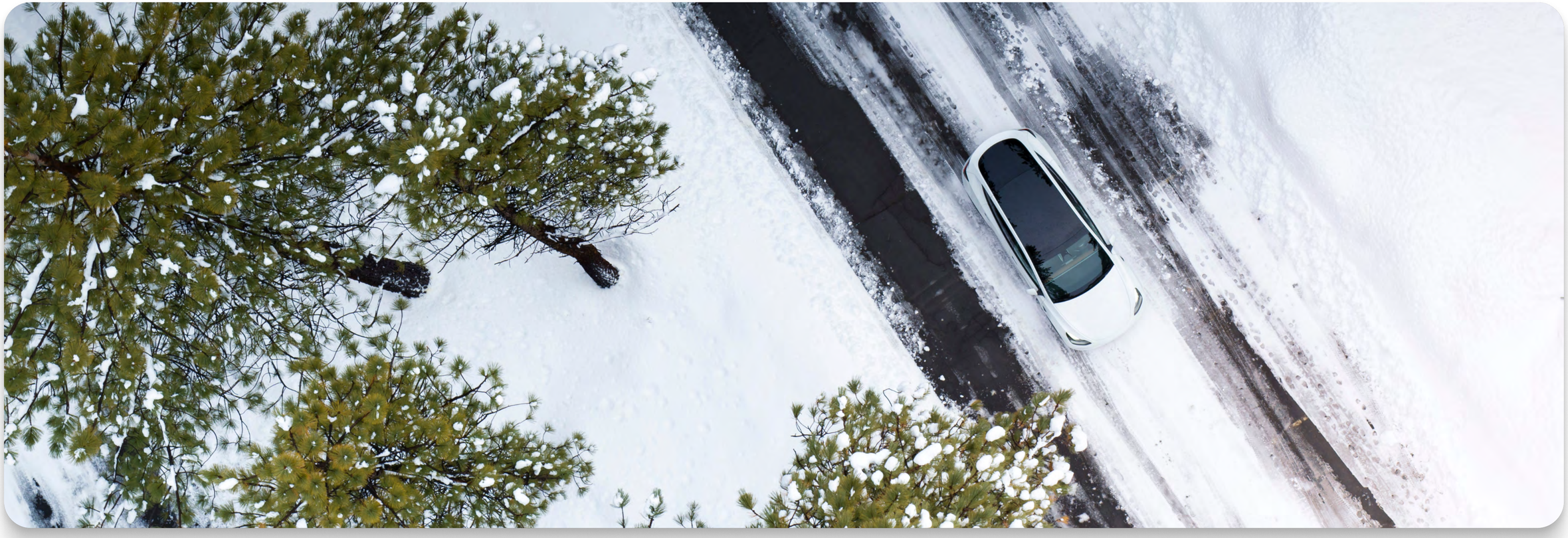
Tesla supports making as much progress as possible toward a zero-emission future–indeed, it is our core mission as a company. There is a lot of work left to do to build a GHG-accounting system that holds polluters accountable, highlights the work being done by companies building zero-emission products and achieves the goal of decarbonizing the economy.

Scope 1 GHG Emissions:
From stationary combustion, mobile combustion and process emissions

Scope 2 GHG Emissions:
From production of purchased electricity and heat



In 2022, our customers avoided releasing about 13.4 million metric tons of CO_2e into our atmosphere.



The more products we deliver, the faster we accelerate our mission

In 2022, the global fleet of Tesla vehicles, energy storage and solar panels enabled our customers to avoid emitting 13.4 million metric tons of CO_2e. That's equal to over 33 billion miles of driving.

Learn more about how we calculate emissions savings on page 204.



Our products continue to get greener over time.



We use primary data to calculate emissions from our products

With data from over four 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 to match. This also means that we can calculate our use-of-product emissions year-over-year. We do not have to estimate emissions over the lifetime of the vehicle because we have primary data.

See page 144-150, 156-159 in our Supply Chain section and page 207 in Appendix for more detail.

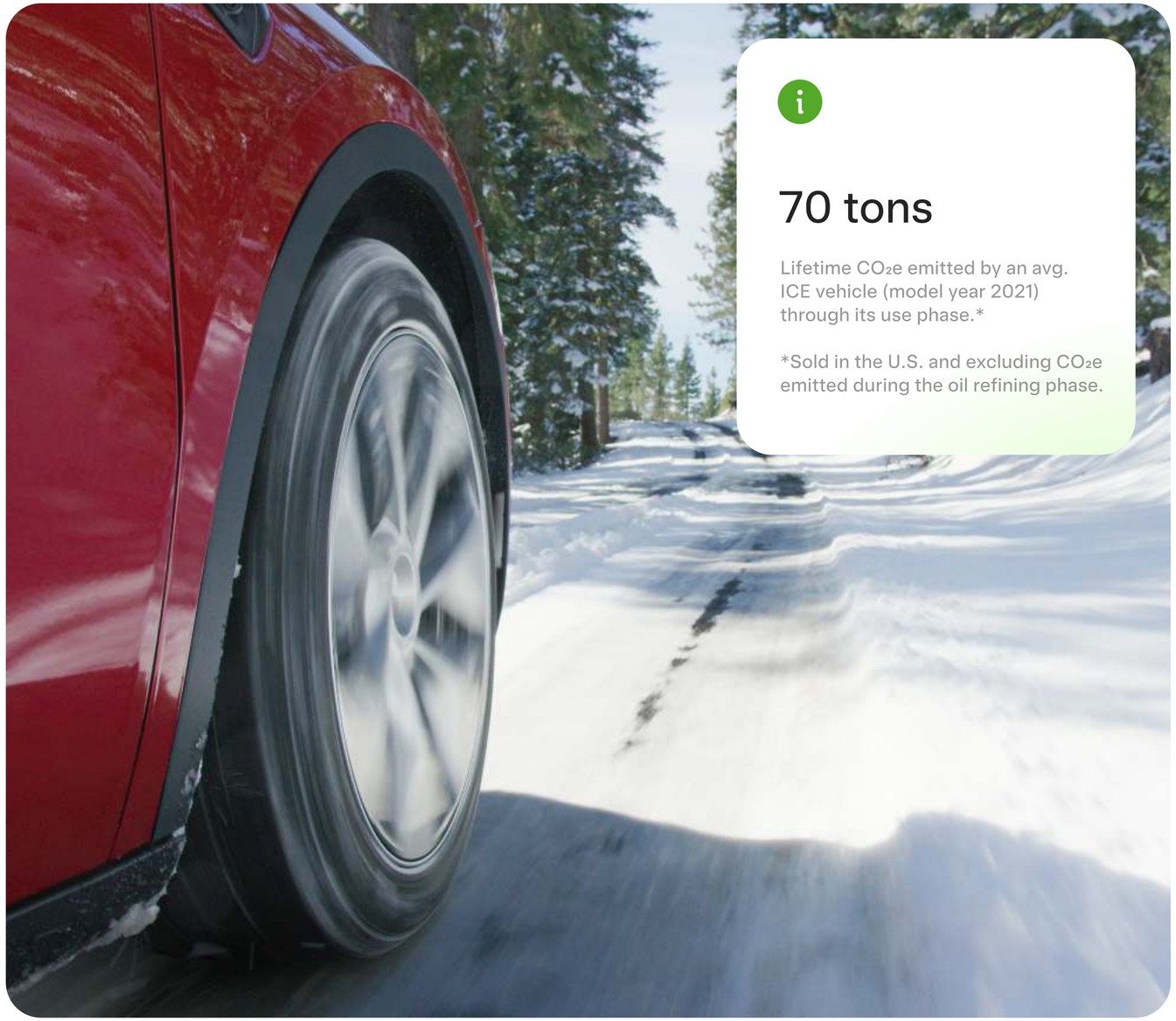


NEDC, WLTP or EPA testing cycles do not represent real-world fuel or electricity consumption

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 2021 mid-size premium sedans achieve 24.3 MPG on average. This translates to over 400 grams of CO_2e per mile once we account for emissions generated through the extraction, refining and shipment of oil.

New European Driving Cycle (NEDC)
Worldwide Harmonized Light Vehicles Test Procedure (WLTP)
U.S. Environmental Protection Agency (EPA)



70 tons

Lifetime CO_2e emitted by an avg. ICE vehicle (model year 2021) through its use phase.*

*Sold in the U.S. and excluding CO_2e emitted during the oil refining phase.

100% renewable Supercharger network.



Powering our vehicles with renewable energy

The global Supercharger network was 100% renewable in 2022, achieved through a combination of on-site resources and annual renewable matching.

More than half of home charging in California was 100% renewable through annual renewable matching.



Lifecycle Analysis Glossary

The per-mile lifecycle emissions of our vehicles include emissions from upstream supply chain, direct emissions from manufacturing and electricity consumption 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.

Before we dive in, here are the scenarios and assumptions we're using for our analysis:

*In 2022, we have added the impact of Model Y to the emissions-per-mile calculation in our LCA. Given that Model 3 and Model Y have 70%-plus parts commonality and share many manufacturing processes, their GHG emissions are very similar.

We have decided 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).



Green NCAP reported that Model 3 has an exceptionally low Estimated Lifecycle GHG Emissions and Estimated Lifecycle Primary Energy Demand, second only to the electric Dacia Spring.

SCENARIOS

Model 3/Y*

Personal Use Solar Charged

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

Personal Use Grid Charged

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

Average Premium ICE Vehicle

Based on an average of mid-size premium sedans and mid-size premium crossover SUVs, with a real-world fuel economy of 24.3 MPG

ASSUMPTIONS

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 gCO_2e/mi*

Model 3/Y

Personal Use Solar Charged	68
Personal Use Grid Charged	134
Average Premium ICE Vehicle	467

New York gCO_2e/mi*

Shift to Greener Grid

Personal Use Solar Charged	68
Personal Use Grid Charged	113
Average Premium ICE Vehicle	467

Manufacturing Phase and Supply Chain
Use Phase

gCO2e/mi = grams of CO_2-equivalent emissions per mile driven

Average Lifecycle Emissions

Europe gCO₂e/mi*

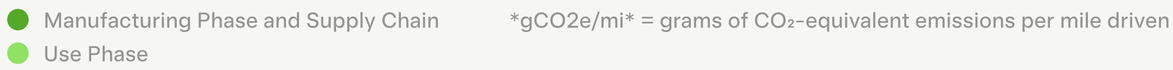
Austria gCO₂e/mi*

Model 3/Y

Personal Use Solar Charged	148
Personal Use Grid Charged	187
Average Premium ICE Vehicle	487

Shift to Greener Grid

Personal Use Solar Charged	148
Personal Use Grid Charged	159
Average Premium ICE Vehicle	487



gCO2e/mi = grams of CO_2-equivalent emissions per mile driven

Average Lifecycle Emissions

China gCO_2e/mi*

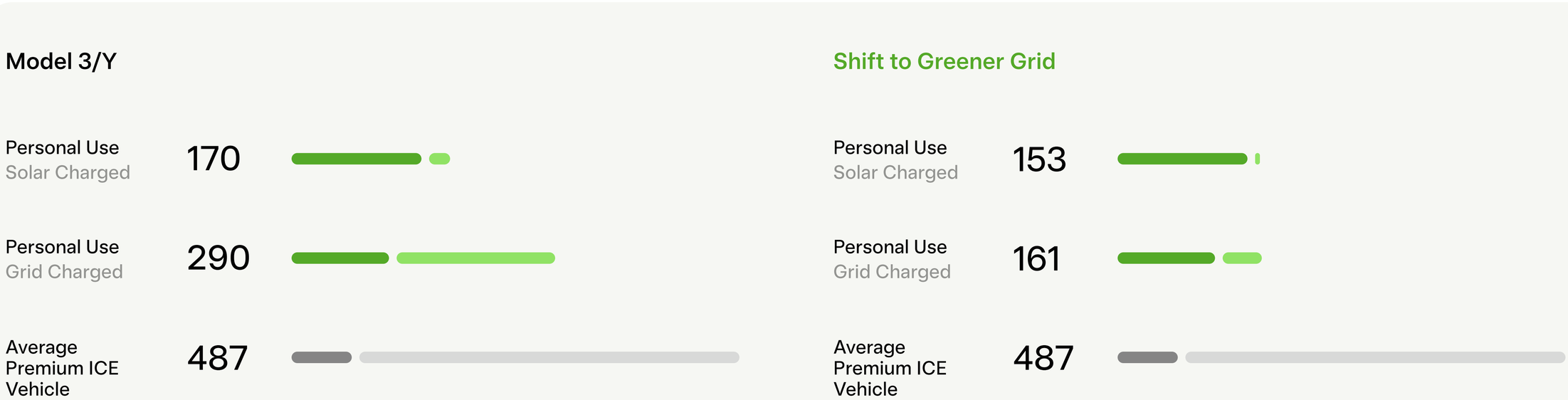
Model 3/Y

Personal Use Solar Charged	170
Personal Use Grid Charged	290
Average Premium ICE Vehicle	487

Sichuan Province gCO_2e/mi*

Shift to Greener Grid

Personal Use Solar Charged	153
Personal Use Grid Charged	161
Average Premium ICE Vehicle	487



gCO2e/mi = grams of CO_2-equivalent emissions per mile driven

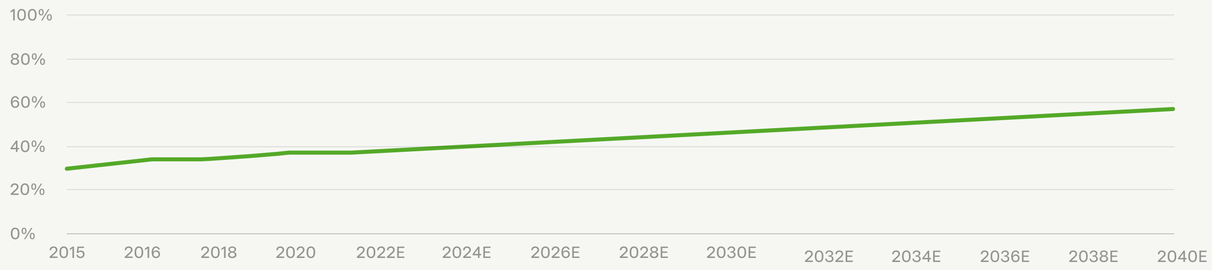
The carbon impact of ICE vehicles remains the same every year of use

The grid keeps getting cleaner, while ICE vehicle emissions do 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.

Charging EVs becomes greener over time



Source: IEA
2022-2040 Tesla estimate based on recent grid mix shifts. Conservatively assumes no change in federal policy or acceleration of move to renewables in the U.S. for electricity generation.

Greater efficiency than a Prius, performance of a Porsche

Model Y is the most efficient electric SUV

Tesla vehicles are among the most efficient EVs built to date. Model Y All-Wheel Drive (AWD) achieves 4.0 EPA miles/kWh, which makes 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	4.3 s 0-60 mph	135 mph Top Speed
Model 3 Long Range AWD	3.9 s 0-60 mph	145 mph Top Speed



Energy Efficiency—EPA range

Small SUVs (AWD) miles/kWh



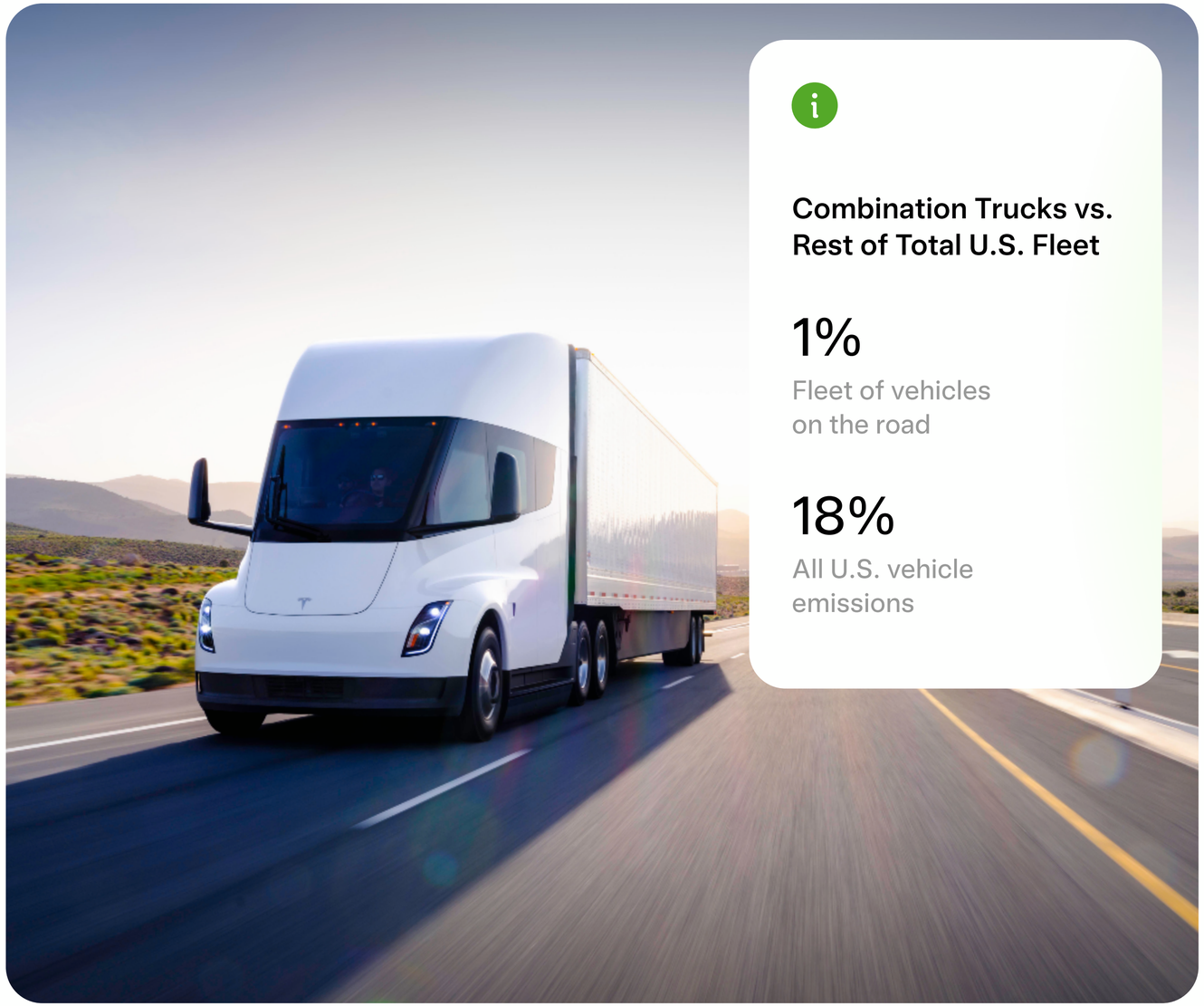
Electrifying heavy-duty trucks is critical to our mission

Combination trucks account for about 18% of U.S. vehicle emissions—Semi will help 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 2.5 times cheaper per mile than refueling with diesel. Operators can see estimated fuel savings of up to $200,000 within their first three years of ownership.*

*Based on average diesel prices in California between February 2022–July 2022 and typical electric rates.



Combination Trucks vs. Rest of Total U.S. Fleet

1%

Fleet of vehicles on the road

18%

All U.S. vehicle emissions

Even after 200,000 miles, our batteries degrade just 12%

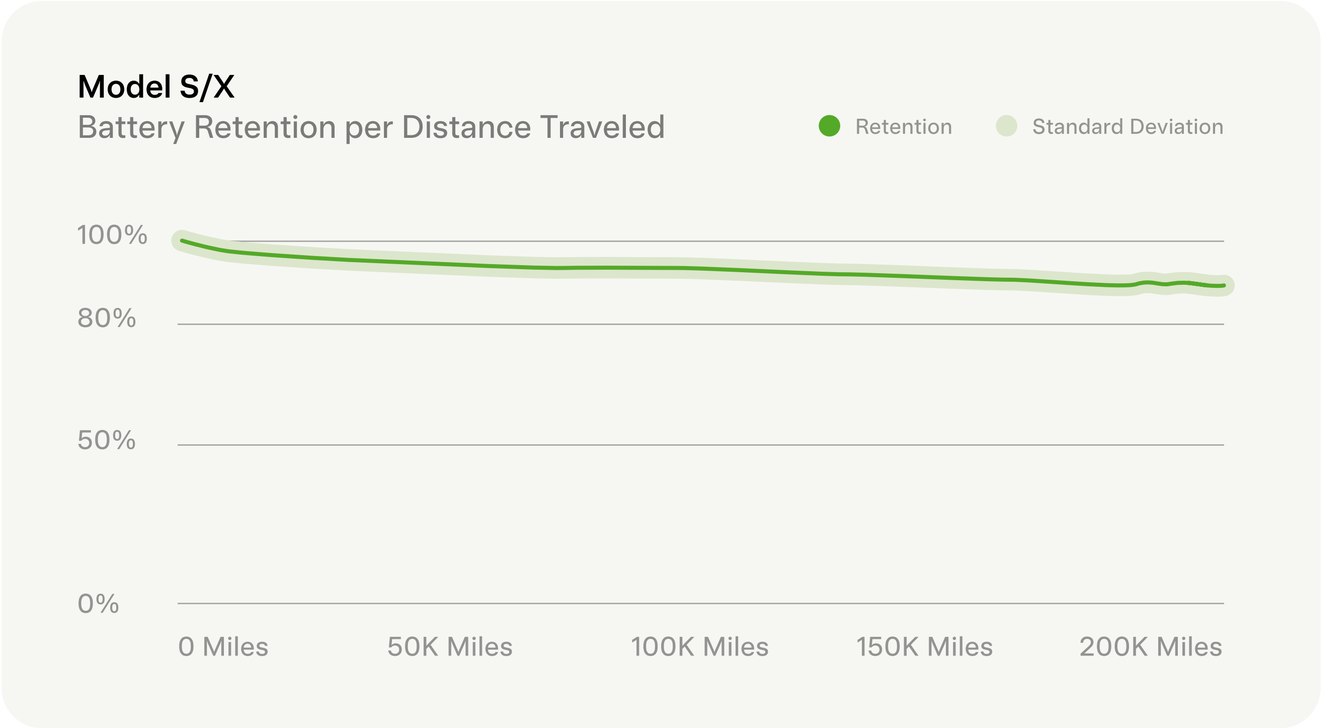
We often get asked: Will I need to replace my battery at some point in the future?

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.

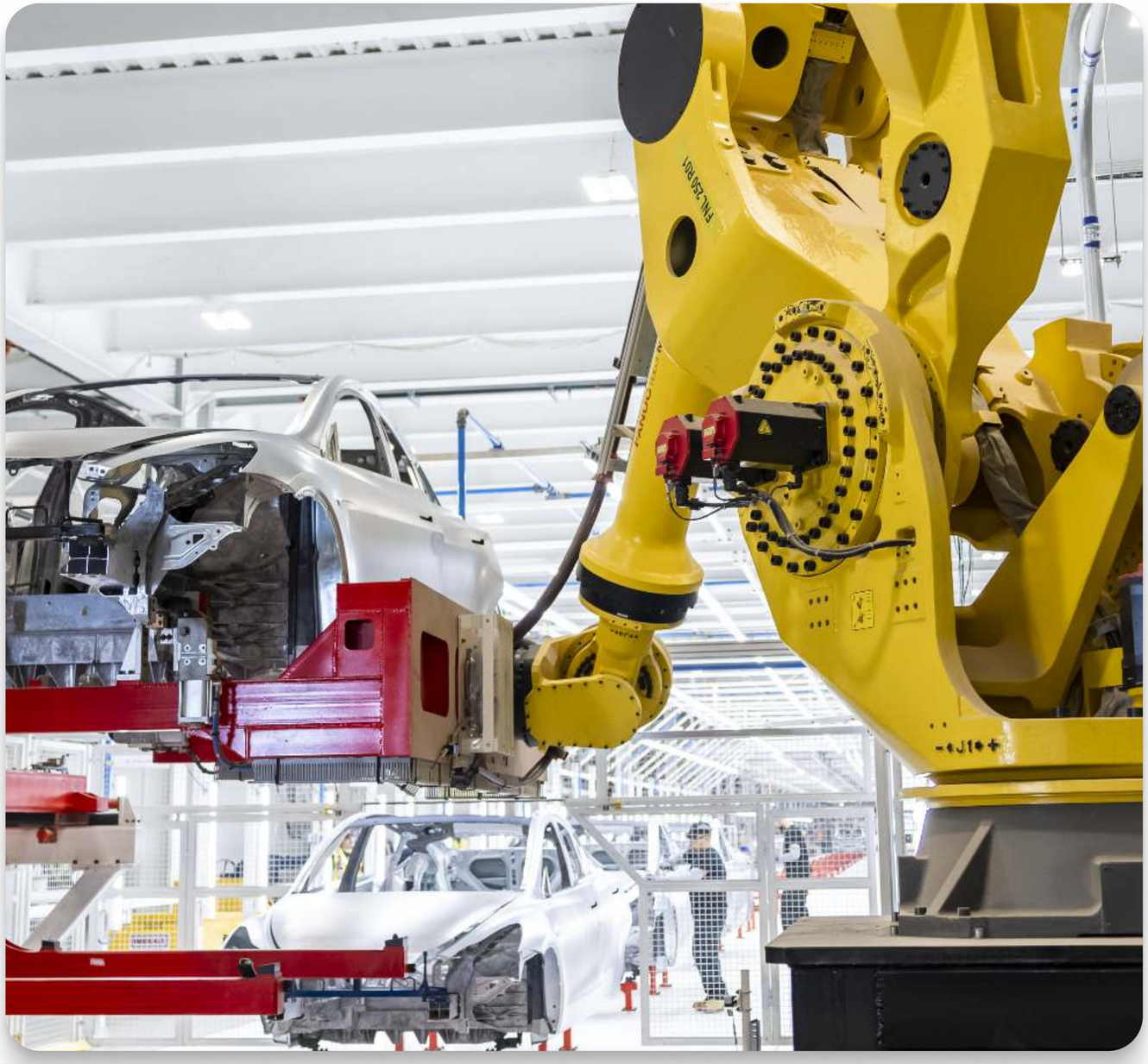
We estimate that a vehicle gets scrapped after approximately 200,000 miles of usage in the U.S. and roughly 150,000 miles in Europe.

Even after 200,000 miles of usage, our batteries lose just 12% of their capacity on average.

Note: Mileage is only one factor in battery capacity retention; battery age is also a major factor. Retention figures at lower mileages above likely reflect the impact of age while higher mileage values, which come from high-utilization vehicles, likely reflect less influence from battery age. Performance of newer chemistries (not yet shown here) can vary and we plan to expand disclosure once we have sufficient data.



We minimize the carbon impact of our operations.



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 impact only increases when you take a step back to include the full lifecycle: raw material mining, product use and disposal.



Minimizing GHG emissions from our full value chain

Our goal is for all Tesla factories to be carbon neutral

In support of our mission, we track and try to minimize emissions that result from our full value chain, including our supply chain and manufacturing processes, as well as our sales, service and delivery activities.

In 2022, we measured our Scope 1 and Scope 2 GHG emissions considering the principles and guidance of the GHG Protocol.



30% YoY reduction in GHG operational emissions per vehicle

Metric	Unit of Measure	Manufacturing	SSD[1]	Other[2]	Total
Scope 1 GHG Emissions	$mtCO_2e$	148,000	27,000	27,000	202,000*
Scope 2 GHG Emissions Location-Based	$mtCO_2e$	305,000	74,000	29,000	408,000*

Scope 1 GHG Emissions:
From stationary combustion, mobile combustion and process emissions

Scope 2 GHG Emissions:
From production of purchased electricity and heat

[1] SSD = Sales, Service & Delivery
[2] Other includes sites that conduct research and development, administration, energy product warehousing and deployment and other mixed-used warehousing.

*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.

We measure all Scope 3 emissions categories, but focus on the largest: product use and supply chain

Scope 3 emissions calculations are often highly academic, even those frameworks that are widely used like the GHG Protocol. They rely on large estimations and assumptions that often lead to figures that are not reflecting the true impact.

Tesla is in a unique position because we obtain real data for the use of our products and our high level of vertical integration and direct sourcing relationships positions us to develop world-class data management systems.

For Tesla's Scope 3 GHG emissions, please see the metrics on page 207 in the appendix.
For Tesla's supply chain GHG emissions, please see page 150.



Reducing our manufacturing footprint

Building more sustainable factories from the ground up



Covering roof space with solar panels



Leveraging AI to make our energy use more efficient



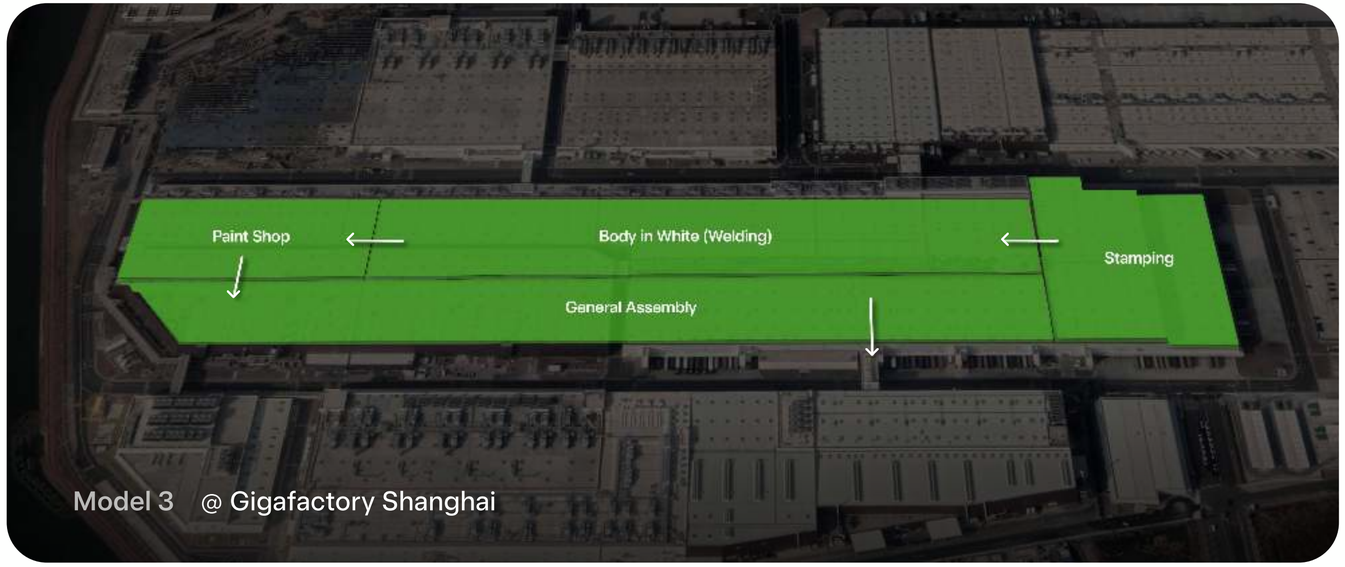
Building more sustainable factories from the ground up

We 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. In addition, waste heat recovery from our compressors alone will offset over 1 MW of natural gas consumption for process heating.

While we have already completed substantial improvements at Gigafactory Shanghai, further improvements will continue at Gigafactory Berlin-Brandenburg and Gigafactory Texas.

19% less kWh of energy used in Shanghai vs. Fremont





Covering roof space with solar panels

We design new factories to be covered with solar panels. By year-end 2022, we had installed 32,400 kW of solar at our factories—with the largest installation at Gigafactory Texas. We will continue to add more renewable energy to serve our factories and facilities.

32,400 kW of solar panels installed on factories

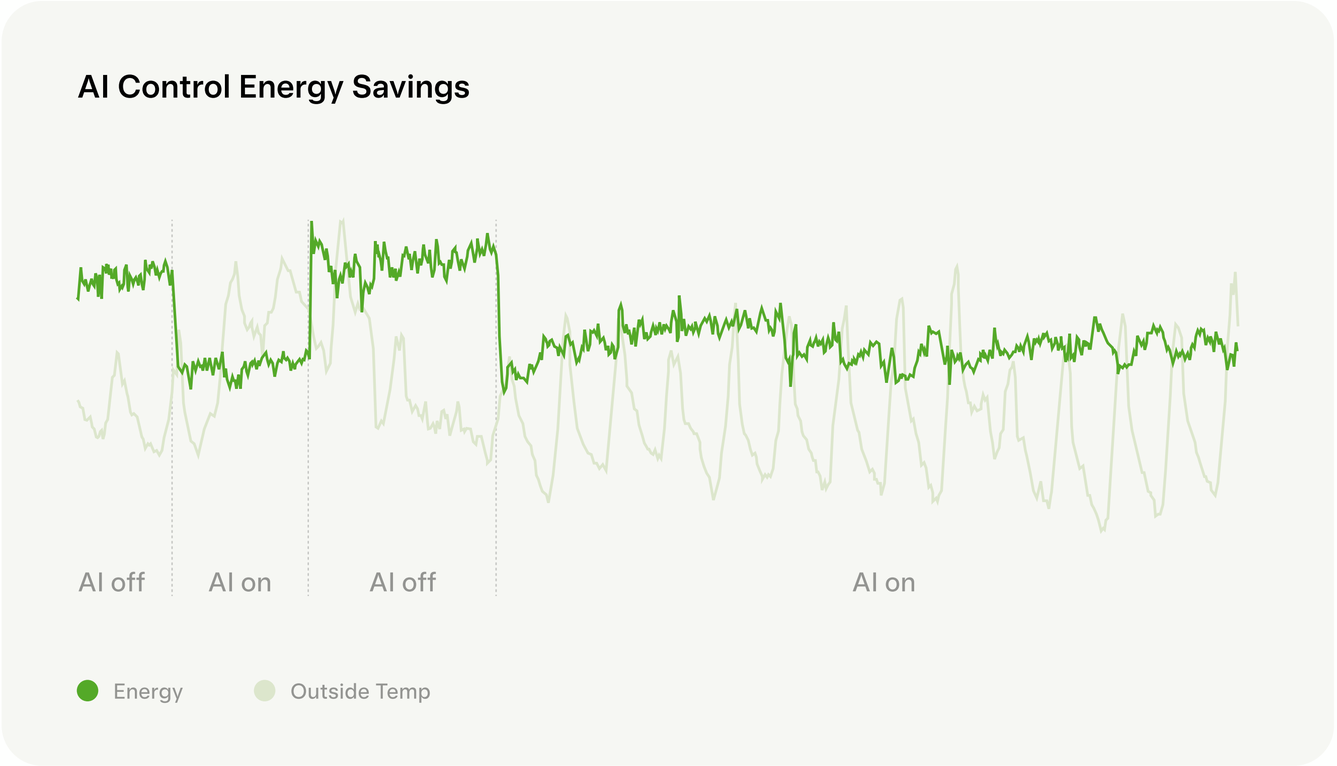


Leveraging AI to make our energy use more efficient

In 2022, AI Control was launched at Gigafactory Texas and expanded to 34% of the total heating, ventilation and air conditioning infrastructure at Gigafactory Nevada. 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 pre-existing standard control logic of each system. In the event of any AI Control error, each system seamlessly reverts to standard control.

As a result, there have been zero safety incidents or production interruptions related to AI Control.



Reducing our carbon footprint even further

In order to reduce the cost of our vehicles and batteries, we also need to use less energy to produce them.

At Tesla's 2020 Battery Day, we presented a novel way to manufacture cells using a dry-electrode 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 new dry-electrode 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.

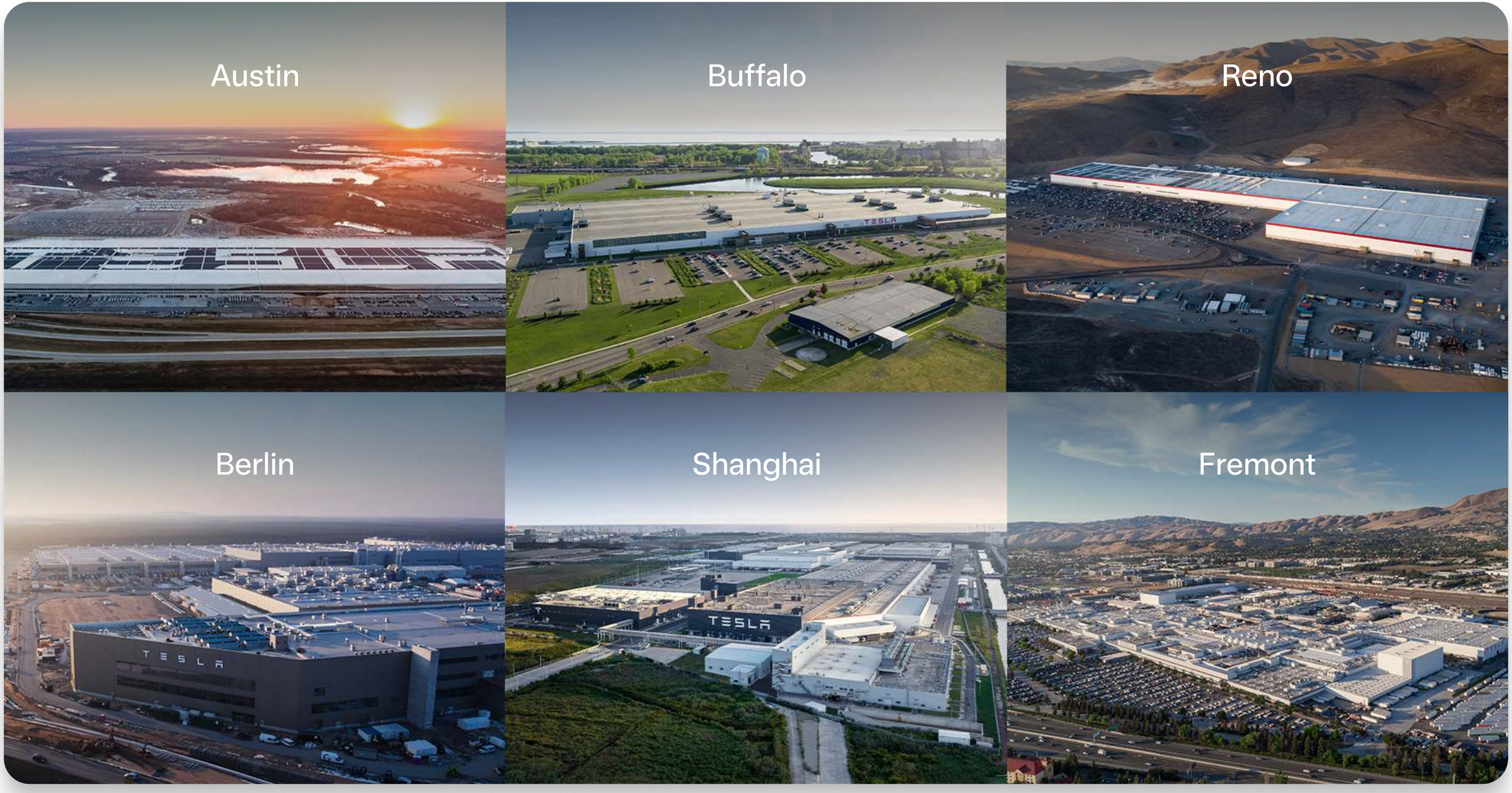
We plan to shift energy consumption toward renewables as quickly as possible throughout our operations—whether it is at our factories, sales, service or delivery locations or through our Supercharger network.



Transitioning to in-house manufactured 4680 Tesla cells, whose production process can reduce energy consumption by more than 70%



Utilizing renewable energy as much as possible throughout all our operations


Austin
Buffalo
Reno
Berlin
Shanghai
Fremont

We use less water per vehicle than the industry average.



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 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.

15% YoY reduction in water used per vehicle

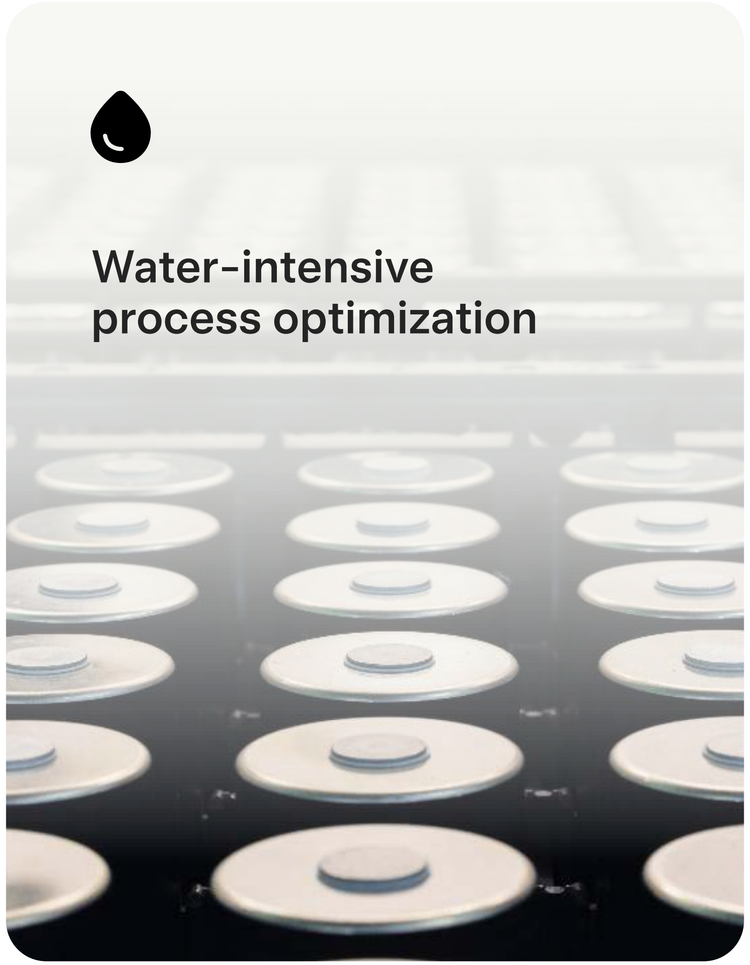
Please see metrics on page 208 in the appendix for more information.

Water Withdrawal Intensity in Global Vehicle Manufacturing (m^3/vehicle)

	Vehicle Manufacturing	Cell Manufacturing
Gigafactory Berlin (est.)*	1.80	0.48
BMW	1.90	0.00
Tesla (2022)	2.57	0.00
Gigafactory Texas (est.)*	2.78	0.84
Mercedes-Benz	2.91	0.00
Industry Avg.	3.68	0.00
VW Group	3.75	0.00
Ford	3.80	0.00
Toyota	4.12	0.00
GM	4.54	0.00
Stellantis	4.77	0.00

*Latest estimate for water consumption based on factory design. Actual production figures will not be known until factories are ramped to full production.
Other manufacturer water efficiency comes from publicly available data with the latest year available.
Source: Latest OEM disclosures

Setting a new standard for water use per vehicle



Water-intensive process optimization



Rainwater and condensate harvesting and reuse



Reclaimed and recycled water

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.



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 7.5 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 reuse this condensate in our cooling towers and process water systems to offset incoming site water.



Reclaimed and recycled water

The “cooling tower makeup” is the single biggest contributor to water usage in any car 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. Based on our latest estimates, at Gigafactory Texas, this could result in an estimated 170 million gallons of potable city water conserved annually.

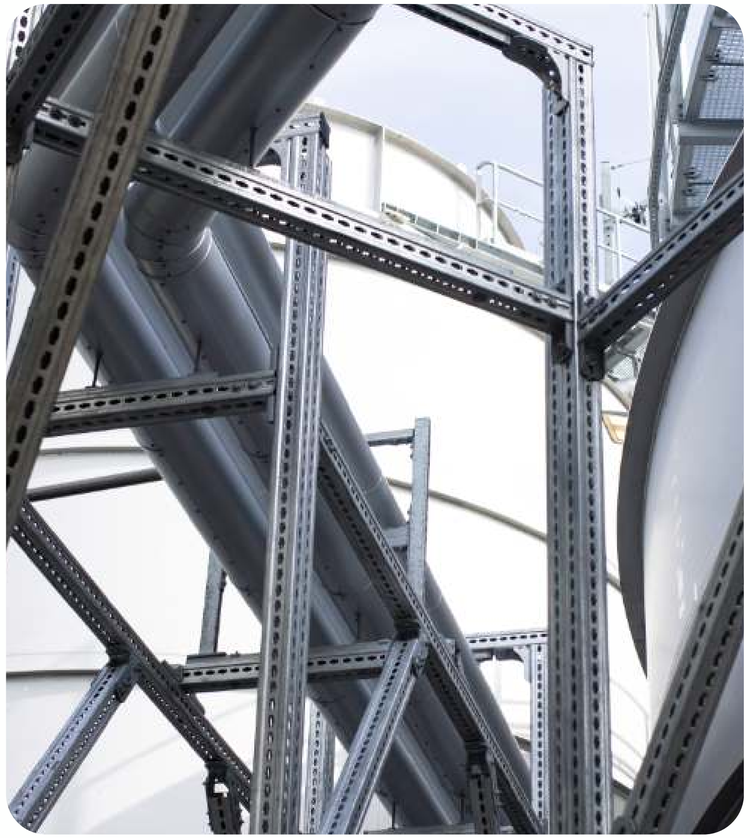
Starting in 2023, we will begin using reclaimed water for our landscape irrigation needs at Gigafactory Texas. Once fully deployed, we expect this to save just under 150 million gallons of potable city water annually.

A note about water usage and power generation

While many recognize the impact that power generation has on GHG emissions, its impact on water consumption is less appreciated. Power generation is one of the leading 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.

Every kilowatt-hour of clean solar energy produced lowers GHG emissions and lowers water consumption



As we build more efficient factories, our waste per vehicle decreases

Our legacy manufacturing operations at the 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.



We recycle all materials possible

The vast majority of generated waste—such as paper, plastics and metals—is recyclable. At Gigafactory Shanghai, for example, just 7% of total waste generated in 2022 was not recyclable.

We push for innovative approaches to waste reduction. Examples include the reduction in use of non-recyclable materials, learning from local factories and deploying improvements globally and minimizing shipments and packaging.

90% manufacturing waste recycled

Please see metrics on page 208 in the appendix for more information.



Note: The chart above shows that waste generation per vehicle at Gigafactory Shanghai is less than half of what it is in the U.S. We are expecting our upcoming factories, such as Gigafactory Berlin-Brandenburg and Gigafactory Texas, to continue the same trend.

03

Product Impact

BETTER IN EVERY WAY



Making EVs Affordable
61-64

Freedom to Travel
65-70

Maximizing Safety
71-89

Building the Grid of the Future
90-97









$0.49
per mile total cost of ownership for Model 3 SR, similar to a Corolla

99.95%
Supercharger uptime

5-Star
rating from NHSTA, Euro NCAP and ANCAP for Model Y

$
Lowest cost per watt solar

<0.001%
failure rate of energy products

3.1 Making EVs Affordable

Affordability is key to mass adoption.



Model 3 is the first EV to be priced on par with ICE vehicle equivalents

The accessibility of our products is fundamental to our mission. Model 3 is the first EV in history priced competitively with its gas-powered equivalents, even before taking into consideration any regional subsidies and lower running costs.

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)
Mid-Sized Premium Sedans



Model 3
RWD

$39,900

Audi A4
$40,300

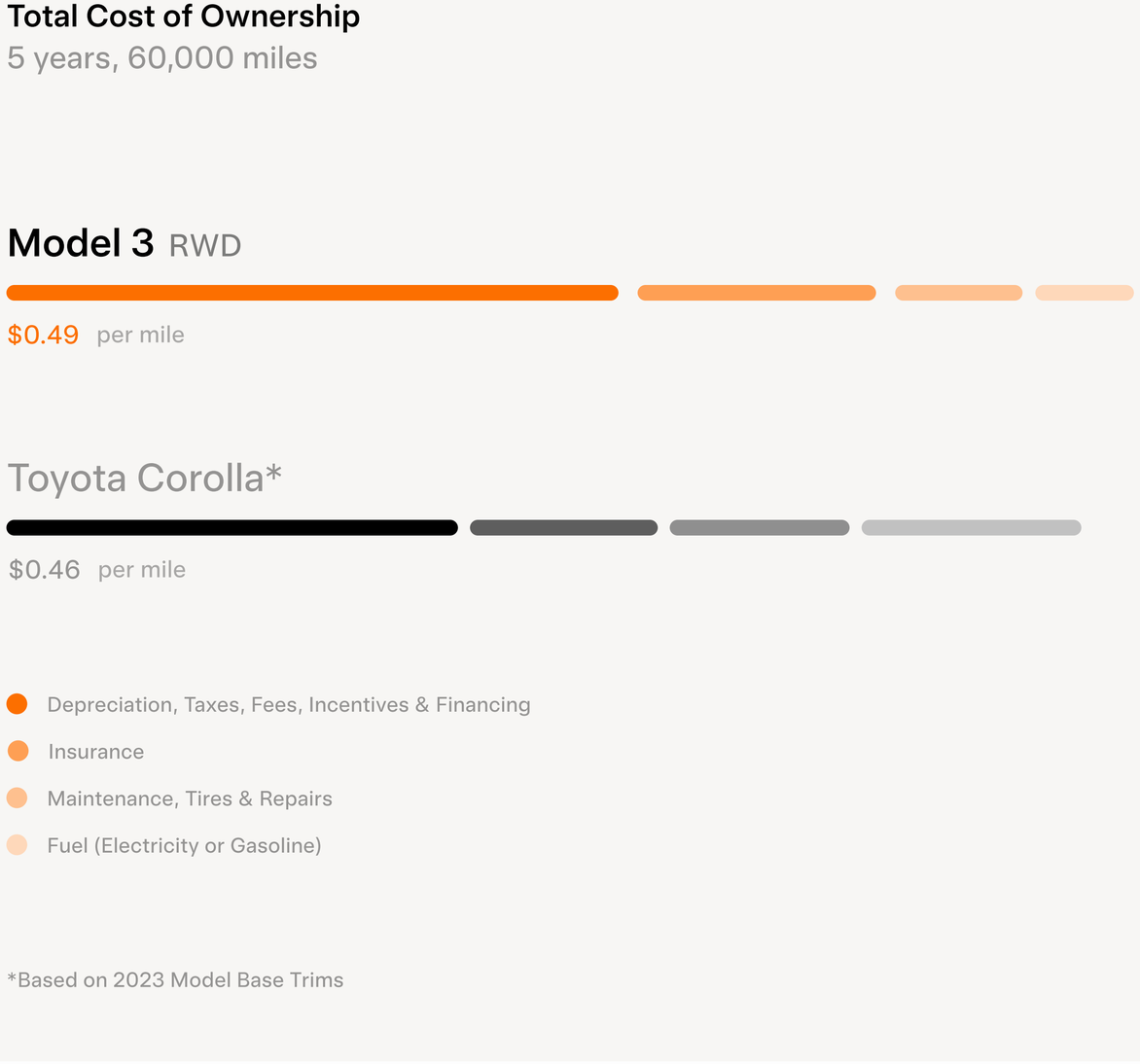
BMW 3 Series
$43,800

Mercedes C-Class
$44,850

Model 3 total cost of ownership per mile is similar to a Toyota Corolla

While the “sticker price” of Model 3 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, cheaper electricity and the high residual value of used Tesla vehicles.

Note: The advantage of having a fleet of vehicles that is constantly online is the ability to analyze real-world data rather than only being able to use estimates. We have an extensive database of Model 3 residual values and cost of repairs, maintenance, energy use, etc. Additionally, the insurance cost for Model 3 RWD is based on the projected median insurance rate in the U.S. for Model 3 drivers.

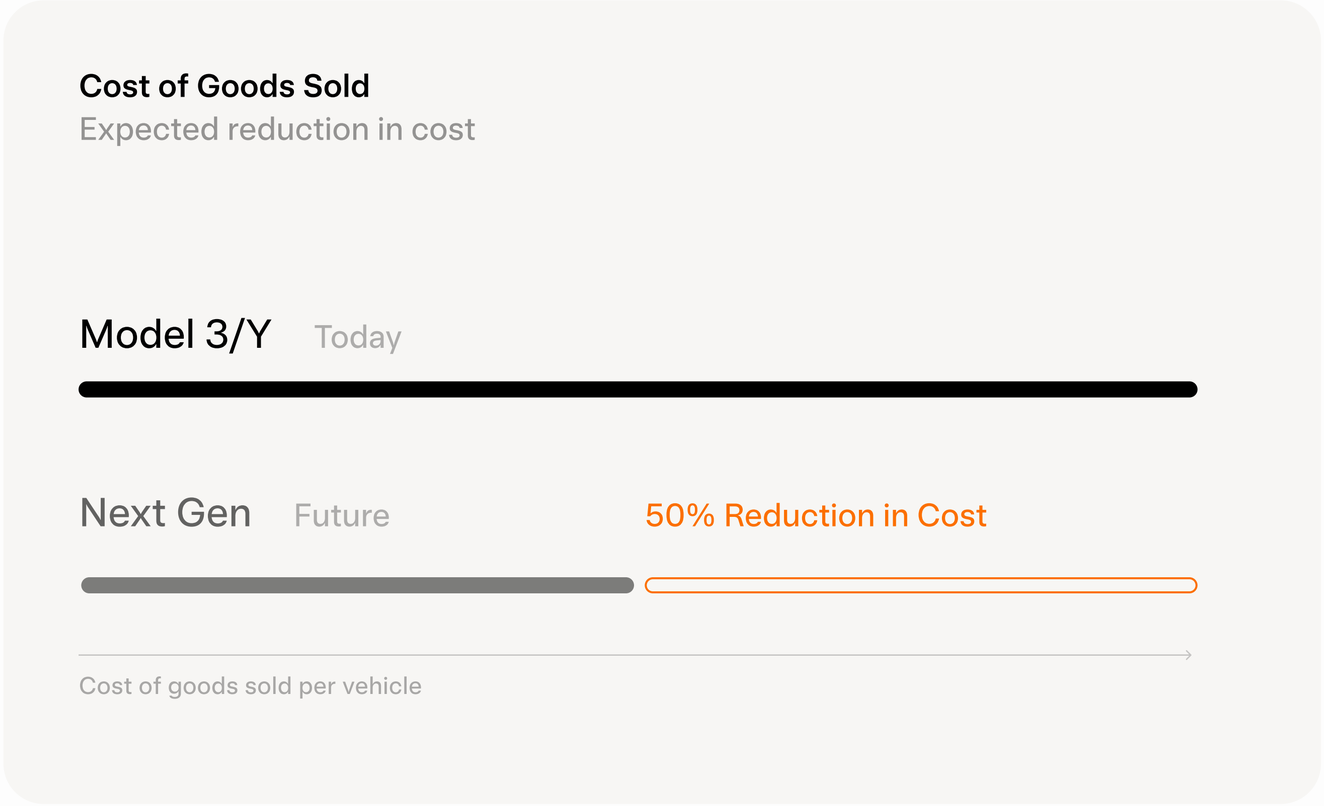


Making EVs even more affordable

Our goal is to build and deliver 20 million vehicles a year by 2030. 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 that cost by another 50% with the introduction of our next generation platform.



3.2 Freedom to Travel

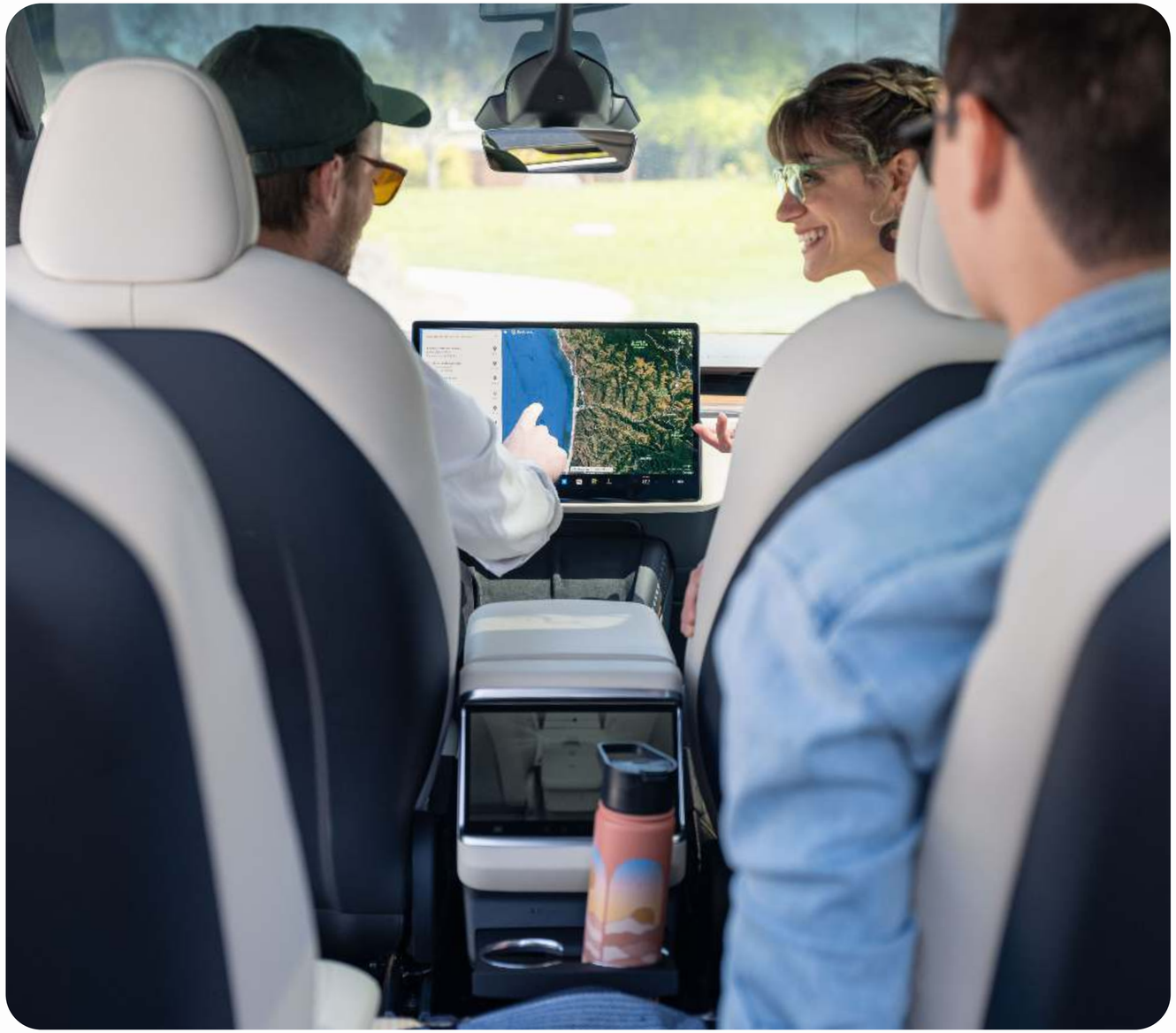
Our products are designed to be better in every way.



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.

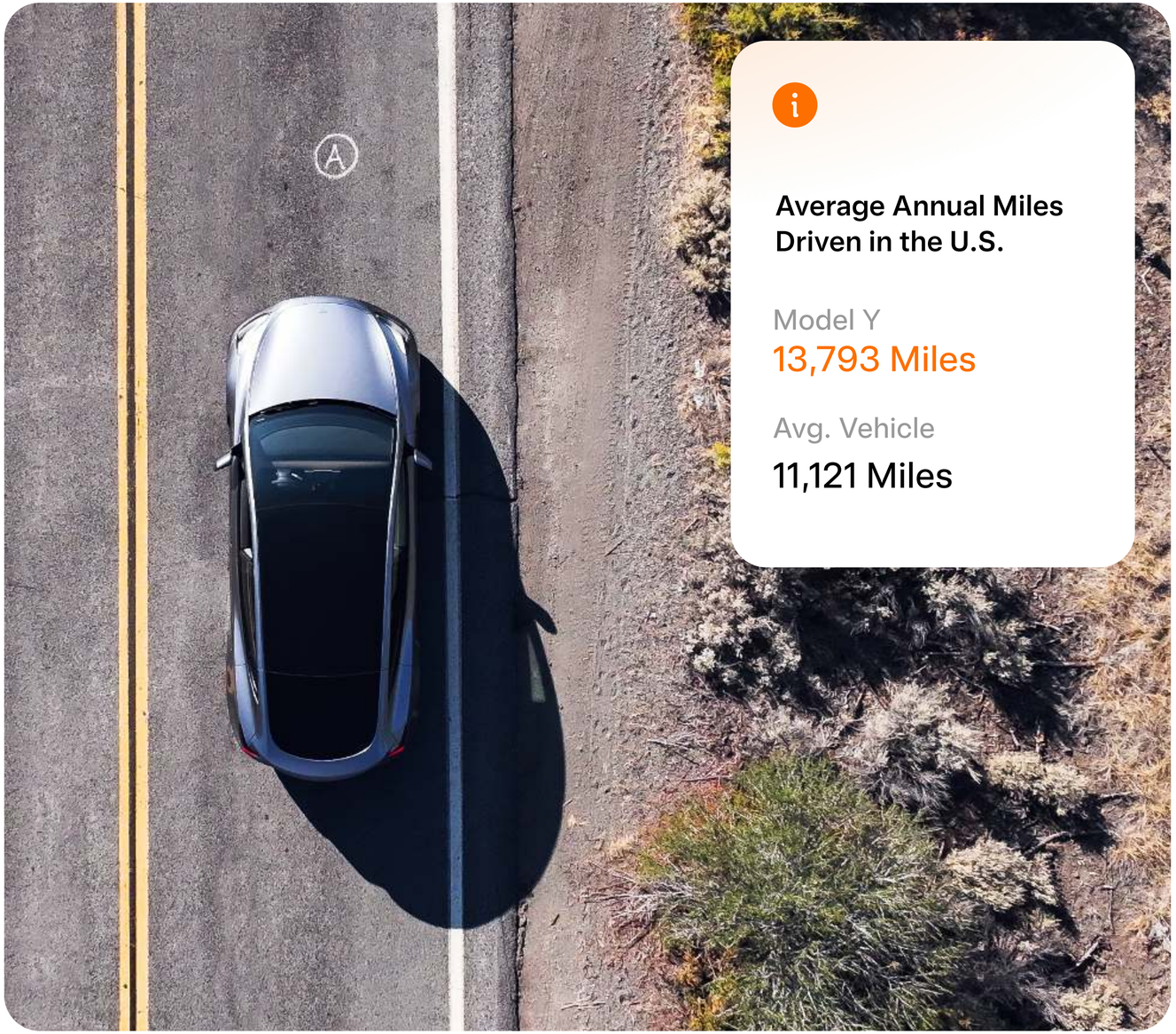


People use their Tesla as their primary vehicle

Our data shows that our customers drive Tesla vehicles more than the average vehicles in the U.S., which suggests that they use their Tesla as their primary vehicle.

Surveys show that range concerns (real or perceived) are a key reason why many people do not replace their ICE vehicle with an EV.

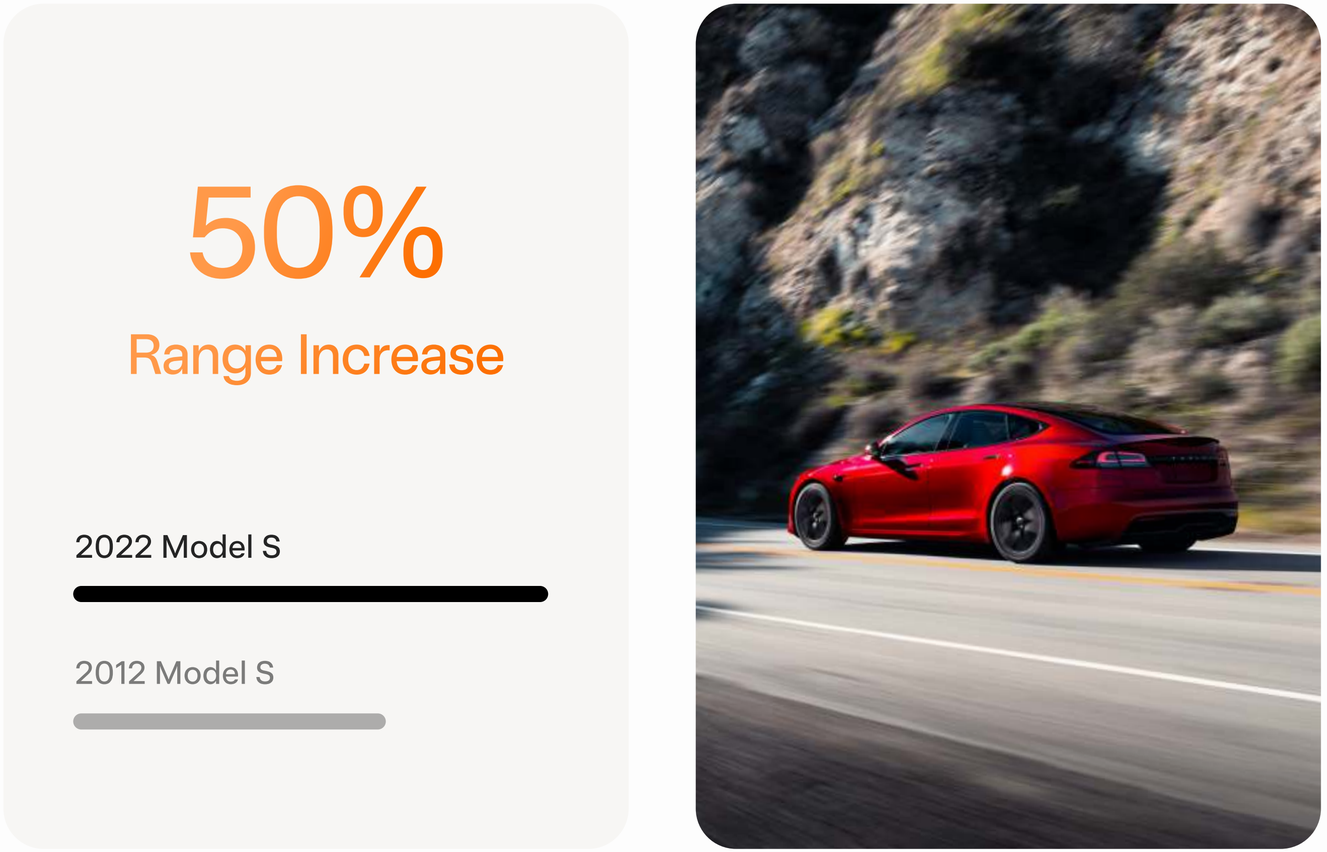
The more confident owners are that their EV can be used for errands, commuting and long road trips, the less they will feel the need to supplement their EV with an ICE vehicle.



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 405 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

300 mi of range at highway speeds = 4 hrs of driving

After four hours on the road, drivers are likely to take a break.

Superchargers can recover up to 200 miles of range in just 15 minutes of charging, long enough for a quick snack.



Chargers that just work



Average Uptime of Supercharger Sites*

99.94%	2018
99.90%	2019
99.74%	2020
99.96%	2021
99.95%	2022

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

3.3 Maximizing Safety

We design our vehicles to be as safe as possible.



All Tesla safety features come standard

Tesla vehicles are engineered to be some 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.

We believe the best crash is no crash and are focused on enhancing avoidance mitigations and active safety improvements in our vehicles.

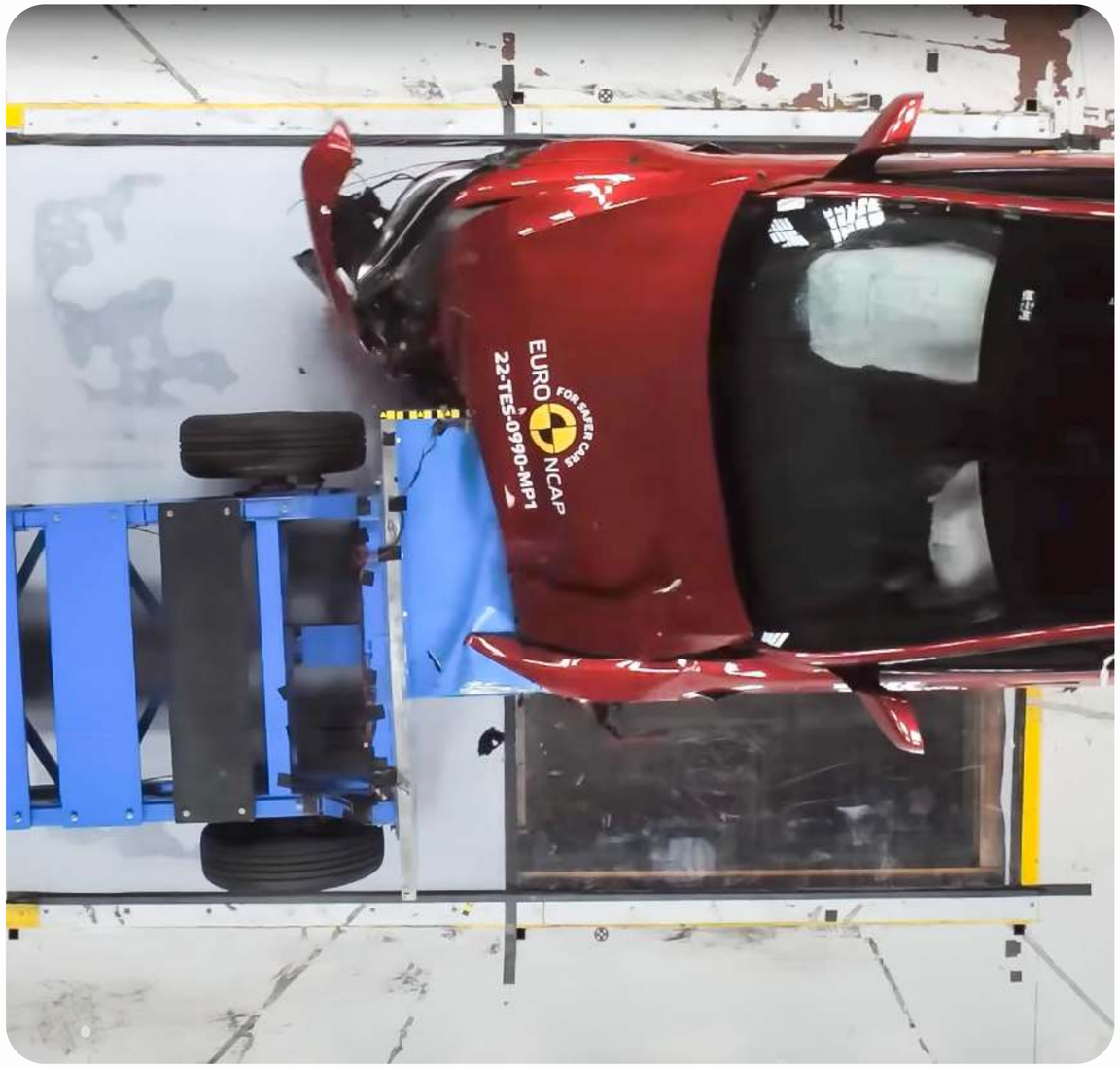
All Tesla vehicles built since October 2016 come with a suite of external cameras, additional sensors and onboard computing that enable advanced safety features like Automatic Emergency Braking, Lane Departure Warning, Forward and Side Collision Warning, Obstacle-Aware Acceleration, blind spot warnings, 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 continuously enhance the customer experience.

Lars Explains | Tesla Vehicle Safety





Source:
Euro NCAP Safety Tests of Tesla Model S 2022 - Best in Class 2022 - Executive | Pure Electric



Source:
Euro NCAP Safety Tests of Tesla Model Y 2022 - Best in Class 2022 - Small Off-Road

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
Model 3	★★★★★ 2022	2022 TOP SAFETY PICK+ 2022	Best in Class 2019 ★★★★★ 2022	Top Performer 2019 ★★★★★ 2022	Top Rating Occupant Safety Active Safety 2021
Model Y	★★★★★ 2022	2022 TOP SAFETY PICK+ 2022	Best in Class ★★★★★ 2022	Top Performer ★★★★★ 2022	Top Rating Occupant Safety Pedestrian Safety Active Safety 2021
Model S			Best in Class ★★★★★ 2022		
Model X			Best in Class 2019 ★★★★★ 2022		

Highest score awarded

Euro NCAP Overall Score 2020-2022 protocol

92%



Model Y

92%



Model S

3% higher than the second highest manufacturers

Lexus NX 89%	Lexus RX 89%	Mercedes-EQ EQE 89%
Subaru Outback 89%	Genesis G80 88%	Mercedes-EQ EQS 88%
Nissan Qashqai 88%	Polestar 2 88%	smart #1 88%
WEY Coffee 01* 88%	WEY Coffee 02* 88%	Hyundai IONIQ 6 87%
Mazda CX-60 87%	Mercedes-Benz C 87%	Mercedes-Benz GLC 87%
NIO ET7 87%	Nissan X-Trail 87%	ORA Funky Cat 87%

*Great Wall Motors

Not all active safety systems are created equal

The range of sensors, compute power and quality of software in Automatic Emergency Braking (AEB) systems can vary dramatically across all vehicle makes and models.

Our active safety features are powered by eight cameras, a neural-net computer and learnings from our fleet of over four million cars. Built on a deep neural network, Tesla Vision deconstructs the vehicle's environment at greater levels of reliability than classical vision processing techniques can.

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.

Safety Assist Rating

	Model X	Model 3	Model Y	Model S
Euro NCAP	94% [1]	94% [1]	98% [2]	98% [2]
ANCAP	94% [1]	94% [1]	98% [2]	Not Rated
IIHS HLDI	Not Rated	Superior	Superior	Not Rated

[1] 2019 Safety Assist Ratings [2] 2022 Safety Assist Ratings

Euro NCAP Safety Assist Rating

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%

Safety is enhanced when Autopilot is engaged

Number of Vehicular Accidents
Per Million Miles (2022)

0.18 Tesla Vehicles
Autopilot Engaged
Mostly Highway Miles

0.31 Tesla Vehicles
FSD[Beta] Engaged
Mostly Non-Highway Miles

0.68 Tesla Vehicles
No Active Safety

1.53 Total U.S. Vehicle Fleet*

*Based on our data of Tesla vehicles and NHSTA data of vehicles

For more information about our methodology, see our Vehicle Safety Report.

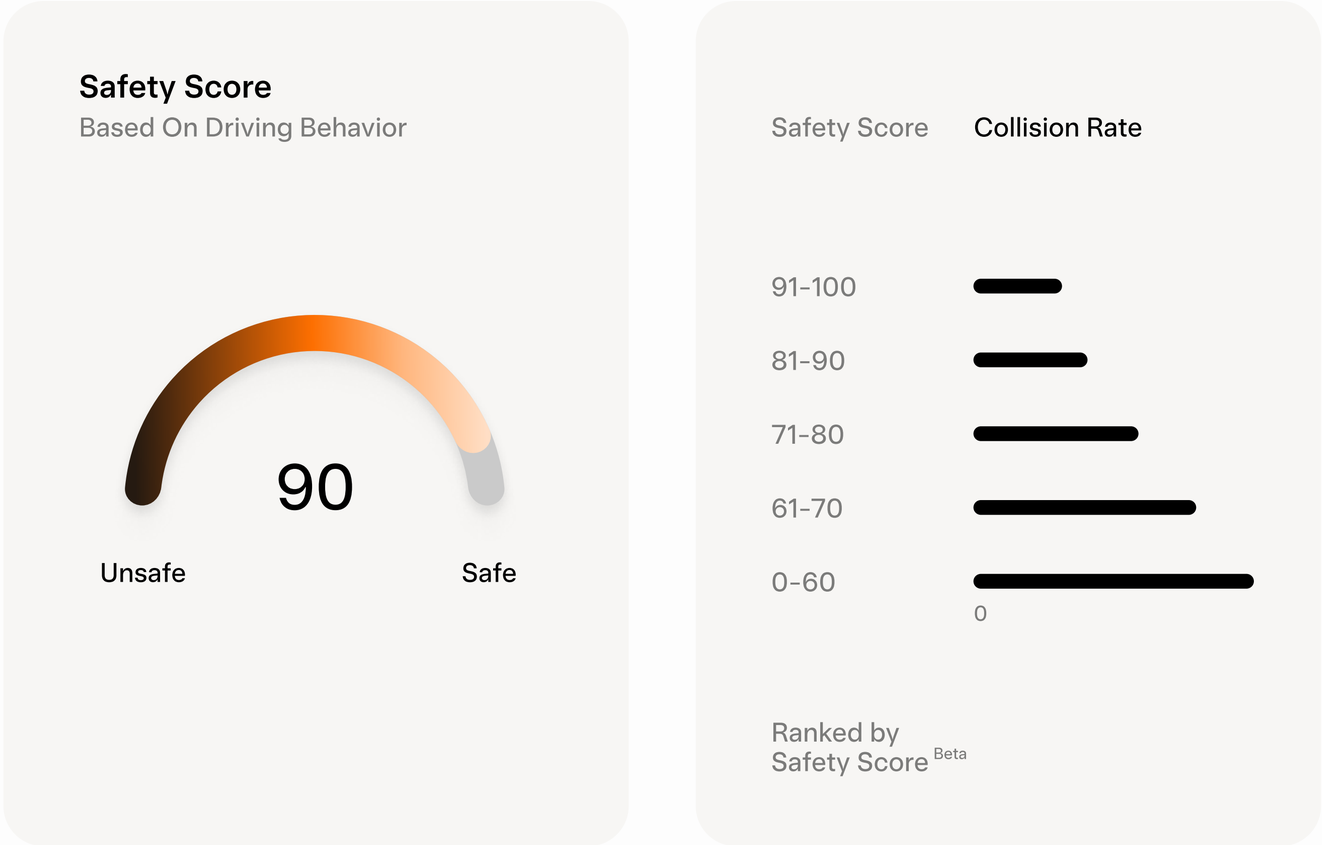


Safety Score[Beta] incentivizes safe driving

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 driver 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



Automatic Emergency Braking continues to improve

Thanks to Tesla Vision—our eight-camera vision-only system—each of our vehicles 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.

Automatic Emergency Braking is a loud warning and quick brake that occurs if our vehicles detect they are on an imminent collision course and the driver has not intervened.



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

Superior nighttime safety

In 2021, U.S. pedestrian and road-user fatalities reached their highest—a 53% increase since 2012—and over 75% of fatalities occur at night.

Model S, Model 3, Model X and Model Y are Euro NCAP five-star rated, including for nighttime pedestrian crash avoidance.

Model 3 and Model Y have also both received “Superior”, the highest possible rating from IIHS, for the nighttime performance of our pedestrian AEB system.



We are using real-world data from our fleet to design our safety systems.

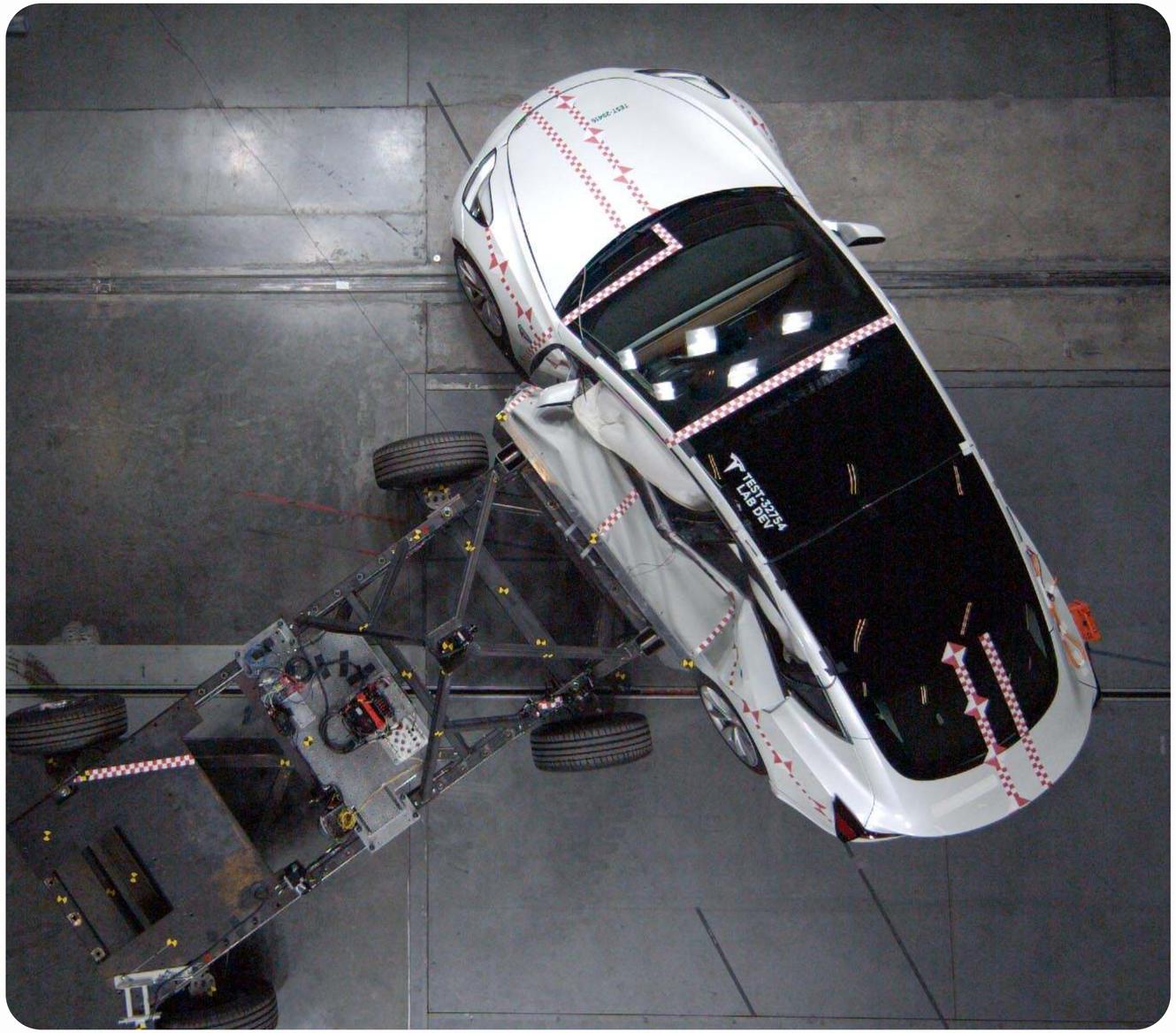


We can learn from any crash

Whether simulated or real, we can learn from any crash to help optimize the protection of occupants and reduce the likelihood of injury.

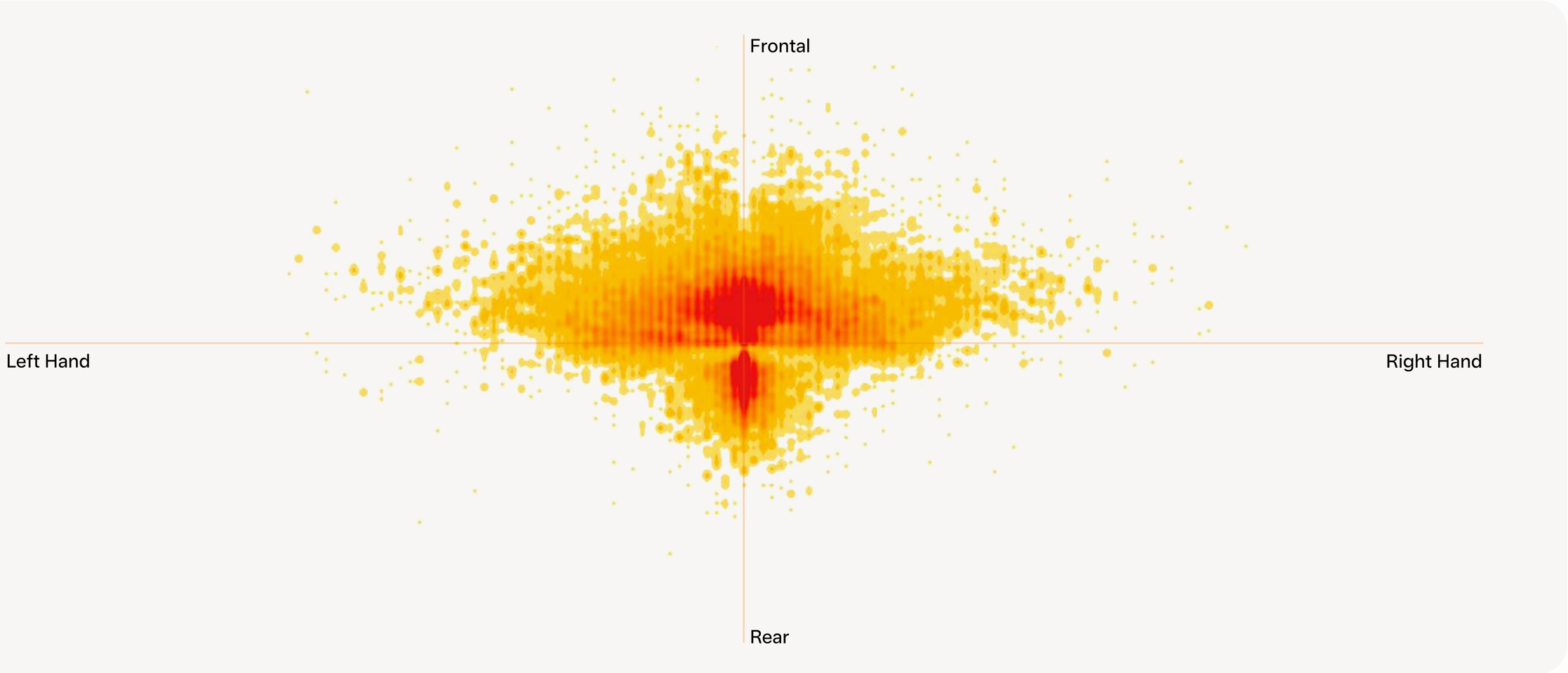
This fundamental philosophy is one of the reasons our vehicles perform at industry-leading levels in regulatory and consumer crash tests globally.

As all of our vehicles are connected, we can further leverage this philosophy by deploying new safety capabilities and improvements over-the-air as a software update.



Real-World Crashes

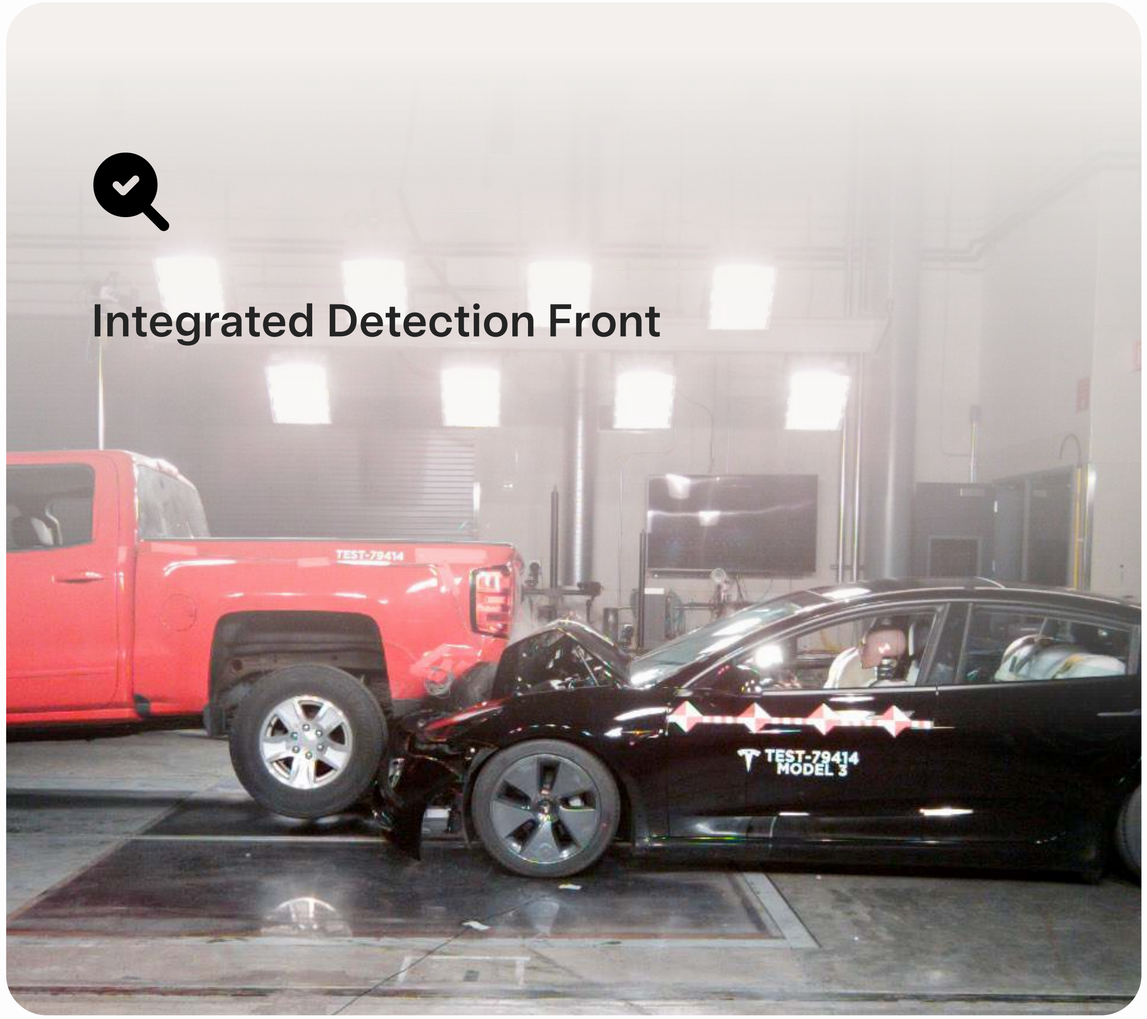
Measured by Impact



Using new data to improve pre-crash safety



Injury Studies



Integrated Detection Front

Injury Studies

We leverage our ever-growing data set to help ensure occupants receives the best possible restraints (such as seat belts and airbags) for the impact they are involved in, and design innovative restraint systems for the future. Our safety analysis engineers evaluate through simulation studies to enhance our understanding of the complex impacts that occur in the field.

The study of injuries has been accelerated by the creation of automated data pipelines and by 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.

Optimizing restraint system performance in real-world crash scenarios



Integrated Detection Front (IDF)

IDF can help us understand the nature of an impact before first contact even occurs in a crash. The IDF system is continuously watching for the potential threat of a frontal impact to our vehicles and acts as an early warning to further enhance our crash-sensing system.

When an imminent frontal impact is detected by our vision system, IDF results in faster and improved restraint decision-making (e.g., early seatbelt pretension where needed). In turn, the new and rich data set from IDF can provide a positive feedback loop of safety analysis.

Deployed to the fleet in an over-the-air update



Moving to Tesla Vision increases performance

In 2021, we decided to remove 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.



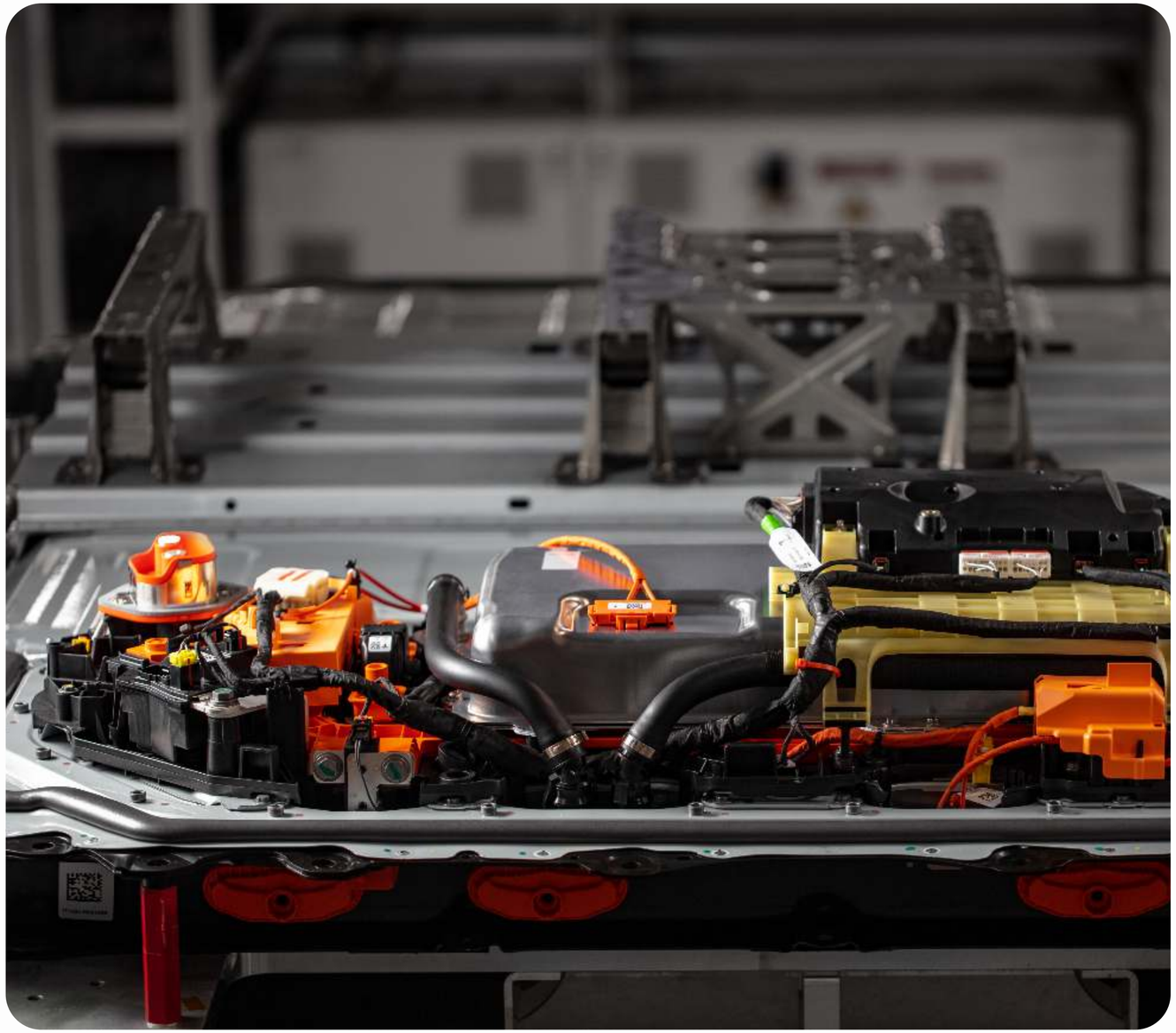
Leading the industry in fire safety

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.

For more information about our methodology, see our Vehicle Safety Report.



Fire incidents are lower for Tesla vehicles than the average vehicle in the U.S.

In 2022, our rate of incidents continued to decrease. We will publish our updated statistics in our Vehicle Safety Report.

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 are developing new and improved methods of identifying and reporting incidents.



Tesla Energy is a one-stop shop.



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 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.

Customers can enjoy a seamless experience whether they are a homeowner looking to achieve energy independence or a utility developer looking for the most cost-effective and reliable energy solutions. Pairing energy storage with renewables enables cost-effective stabilization and decarbonization of the grid.







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.

$ Guaranteed lowest price for solar



Renewables & 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.

Megapack + renewables is cheaper than other conventional solutions

Levelized Cost of Energy Comparison for Megapack and Conventional Resources ($/MWh)



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

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

Highest energy and power density in the industry, upwards of 300 MWh per acre

Less than 0.001% failure rate

Safety is always our priority and we continue to review, test and update our safety requirements and procedures ahead of industry standards.

Failure rates of Tesla energy storage products are extremely low, and are lower than serious transformer fires[1] .

The risk of battery fires, as with all energy infrastructure, is never zero. If we account for all our energy products since inception, the failure rate in 2022 was <0.001%[2].

We expect this number to keep decreasing as we continually improve our products with over-the-air updates.

[1] Source: T&D World
[2] Calculated as # of failures in 2022 / # installed energy storage products as of end of 2022.



04

People & Culture

OUR EMPLOYEES ARE CRITICAL TO ACHIEVING OUR MISSION



Attracting Talent
100-108

Building the Best Workplace
109-122

Compensation
123-131

Social Impact
132-136









3.6 M
applications

~128,000
employees

67%
U.S. employees from underrepresented groups

71%
internal leadership promotions

9.4 yrs
median tenure of senior management

We create lots of jobs and attract exceptional talent.



Our employees are critical to our mission to accelerate the world's transition to sustainable energy

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.

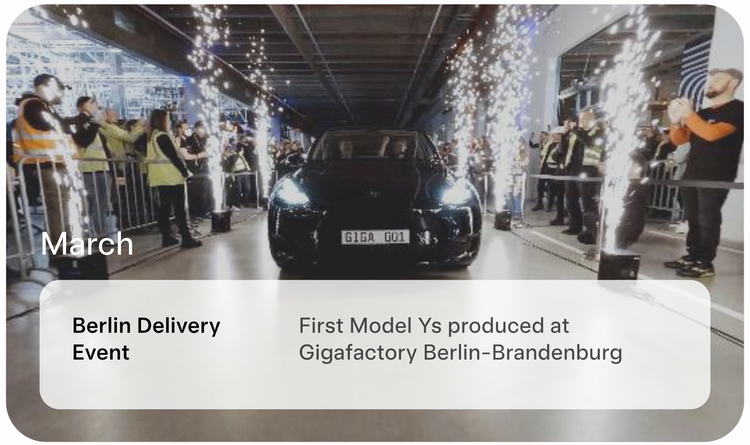
Our greatest asset is our people. We are committed to providing a workplace where our employees feel respected, satisfied and appreciated.

Our policies are designed to promote fairness and respect for everyone. We hire, evaluate and promote employees based on their skills and performance.



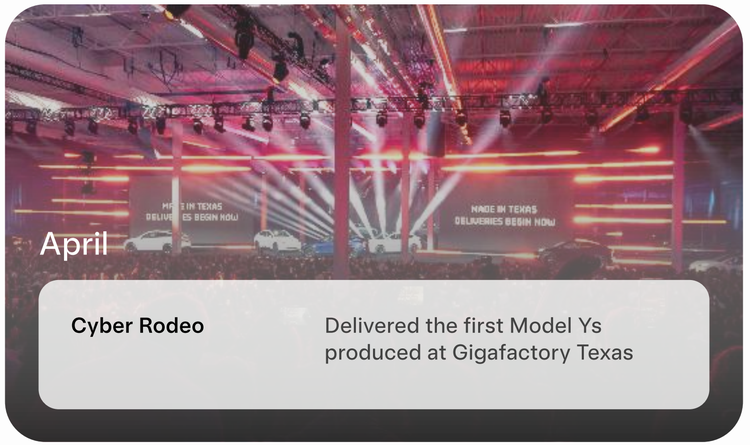
Our exciting product roadmap attracts talent

Launch Events in 2022



March

Berlin Delivery Event	First Model Ys produced at Gigafactory Berlin-Brandenburg



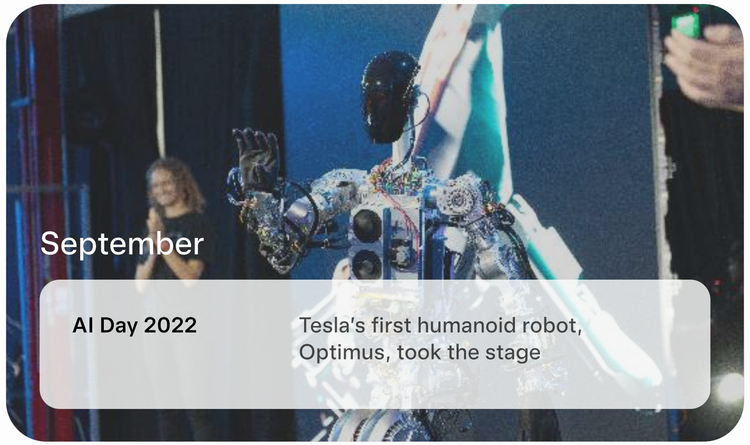
April

Cyber Rodeo	Delivered the first Model Ys produced at Gigafactory Texas



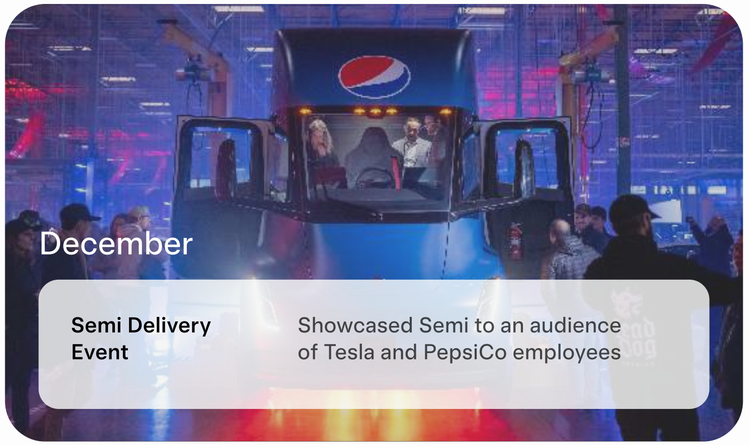
August

Megapack 2, Megapack 2 XL	Launched Megafactory in Lathrop, California



September

AI Day 2022	Tesla's first humanoid robot, Optimus, took the stage



December

Semi Delivery Event	Showcased Semi to an audience of Tesla and PepsiCo employees

Giving direct access to Tesla

We connect with and educate global audiences about our products, mission and career opportunities on social media.

Social channels allow direct and immediate access to Tesla updates, news, launches and more—without the filter of traditional media or influencers.

Twitter

53%
follower growth (YoY)

1 B
total post views

19 M
followers

LinkedIn

16%
follower growth (YoY)

75.5 M
total post views

10.9 M
followers

We grew by 29,000 employees last year globally

To shift humanity away from fossil fuels, we need extreme scale. Headquartered in Texas, we operate six huge, vertically integrated factories across three continents. Our teams design, build, sell and service our products in-house.

As of December 31, 2022, our full-time count for our employees and our subsidiaries' employees worldwide was almost 128,000—a 29,000 year-over-year increase. Half of our workforce is in manufacturing roles with a focus on building our products.

Total Global Employee Count

2022	127,855
2021	99,290
2020	70,757
2019	48,016
2018	48,817
2017	37,543
2016	30,025
2015	13,058
2014	10,161
2013	5,859
2012	2,964
2011	1,417
2010	899

Engineering students want to work for Tesla and SpaceX more than any other organization

At Tesla, meaningful engineering ideas can come from interns, analysts or executives. We strive to minimize red tape so our engineers can be creative and solve engineering problems that have never been solved.

According to Universum's 2022 U.S. rankings.

U.S. Engineering Students' Rankings

Universum 2022

1	SpaceX	11	General Motors
2	Tesla	12	Toyota
3	NASA	13	Ford Motor
4	Lockheed Martin	19	BMW Group
5	Boeing	20	Intel
6	Apple	26	Nvidia
7	Google	28	Honda
8	Microsoft	29	Blue Origin
9	Northrop Grumman	34	IBM
10	Raytheon Tech	38	AMD

We received 3.6 million job applications in 2022.



Supporting EV events

Formula Society of Automotive Engineers (FSAE)

In 2022, we participated and sponsored the FSAE, FSAE Electric and Baja SAE 2022 events with over 60 employee volunteers to recruit and offer engineering mentorship—as well as allocating over $200k for a battery sponsorship program. We also hosted and sponsored the first-ever FSAE EV Workshop at our Fremont Factory for 80 global student teams.

World EV & ES Battery Conference

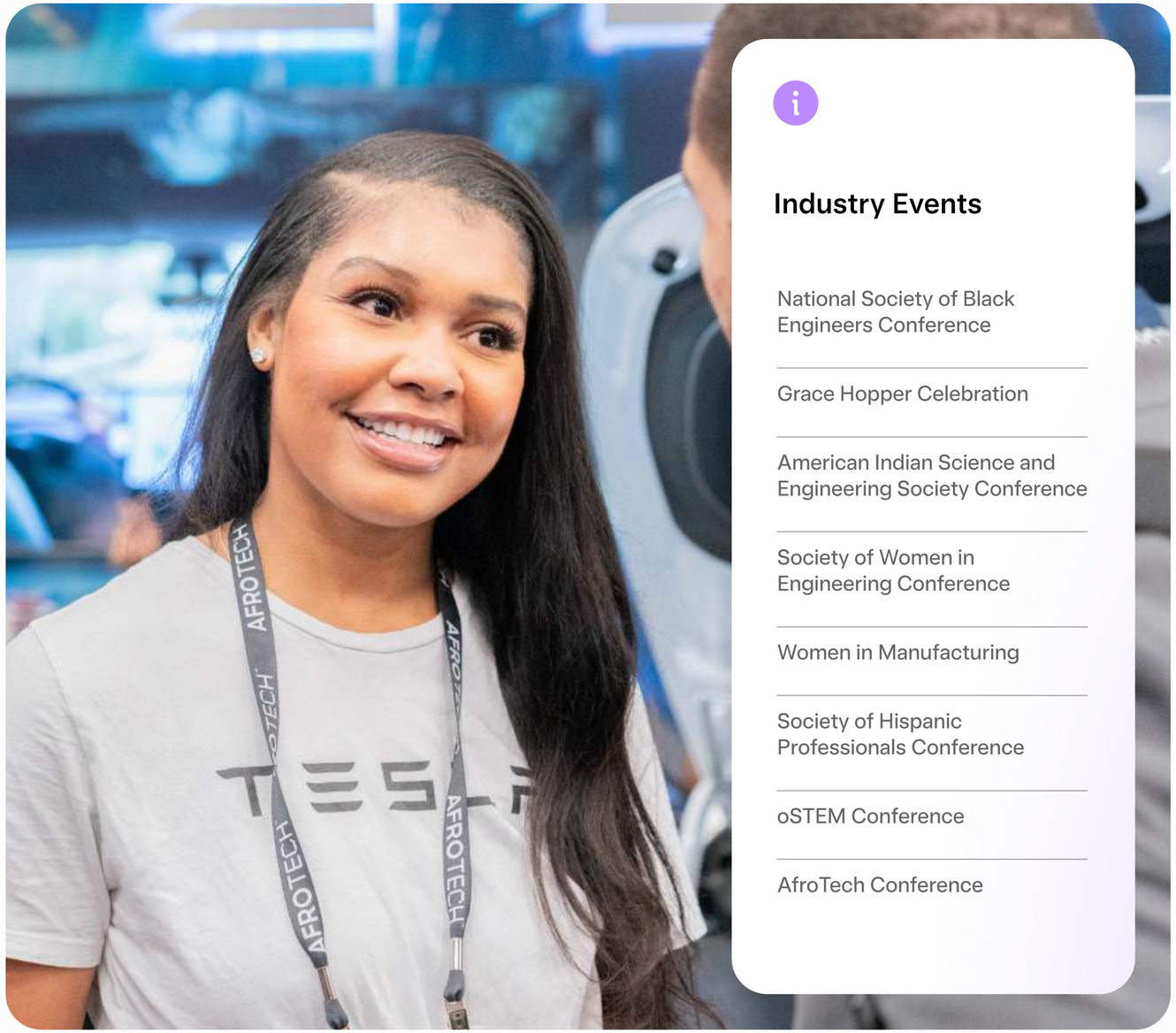
Additionally, we proactively participated in events that were organized by local governments and associations. Our China R&D team attended the 2022 World EV & ES Battery Conference, which was co-hosted by Yibin, Sichuan Province, and China SAE, attracting top talent in battery-related fields.



75+ diversity hiring events

Our internship program continues to be our driving force in attracting diverse entry-level professional talent. In our effort to expand access to our program, we attended more than 75 diversity hiring events targeting women and students of Historically Black Colleges and Universities and Hispanic Serving Institutions.

We also engaged with several organization collegiate chapter members that include the Society of Women in Engineering, the National Society of Black Engineers and the Society of Hispanic Engineers.



Industry Events

- National Society of Black Engineers Conference
- Grace Hopper Celebration
- American Indian Science and Engineering Society Conference
- Society of Women in Engineering Conference
- Women in Manufacturing
- Society of Hispanic Professionals Conference
- oSTEM Conference
- AfroTech Conference

We ensure a safe and fulfilling workplace.

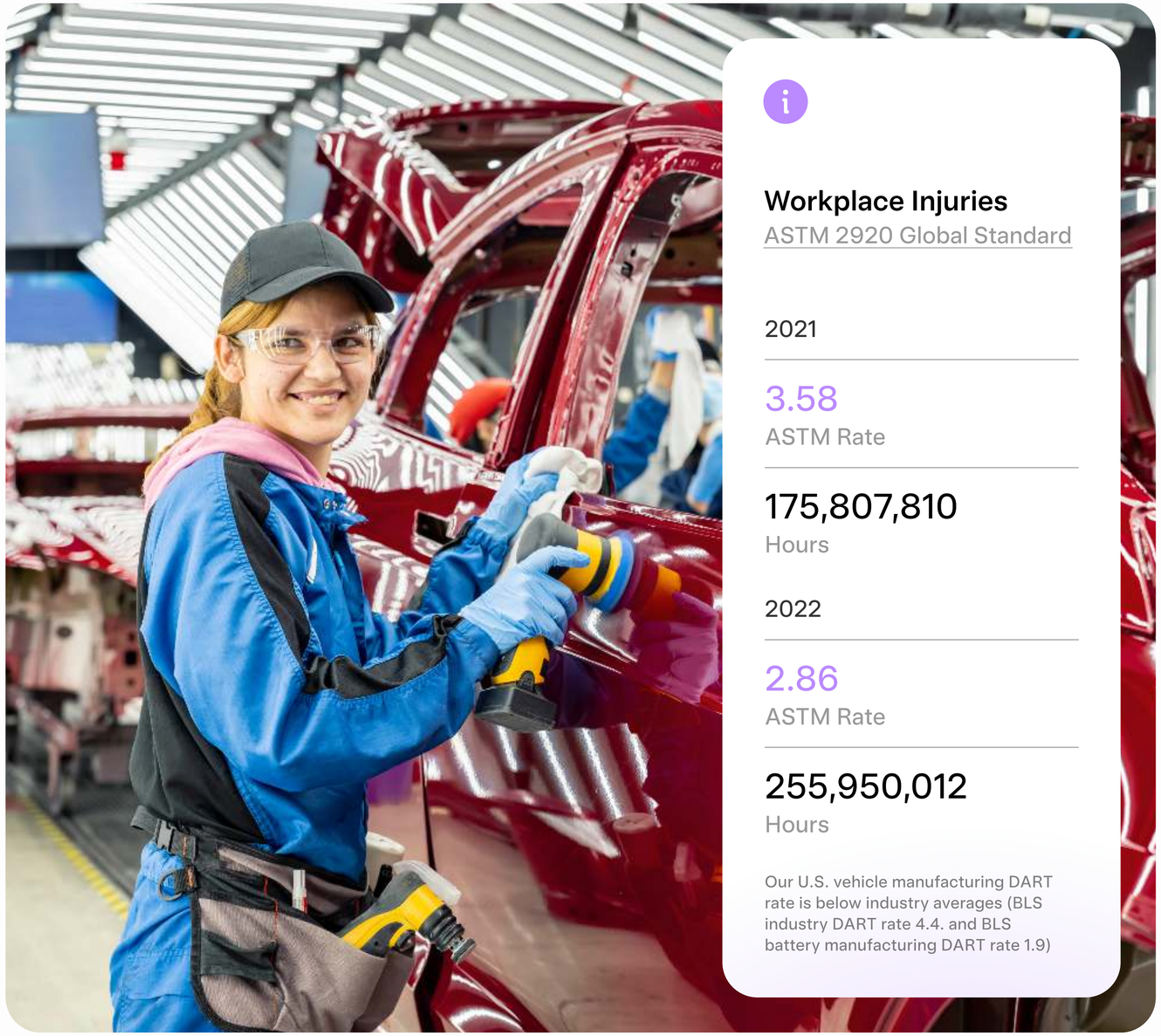


We strive to have the safest and healthiest operations in the world

Our EHS&S teams continuously work to ensure a healthy and safe workplace. We actively engage employees to identify risks before accidents occur and base our programming on three pillars: do the basics right, engage and empower stakeholders and reduce risk.

We no longer measure global operations using the U.S. OSHA record-keeping guidelines. Instead, we follow the international standard organization consensus American Society for Testing and Materials 2920-19.

EHS&S: Environmental, Health, Safety and Security
DART: Days Away and Restricted Time
BLS: Bureau of Labor Statistics
OSHA: Occupational Safety and Health Administration
ASTM: American Society for Testing and Materials



Workplace Injuries

ASTM 2920 Global Standard

2021

3.58
ASTM Rate

175,807,810
Hours

2022

2.86
ASTM Rate

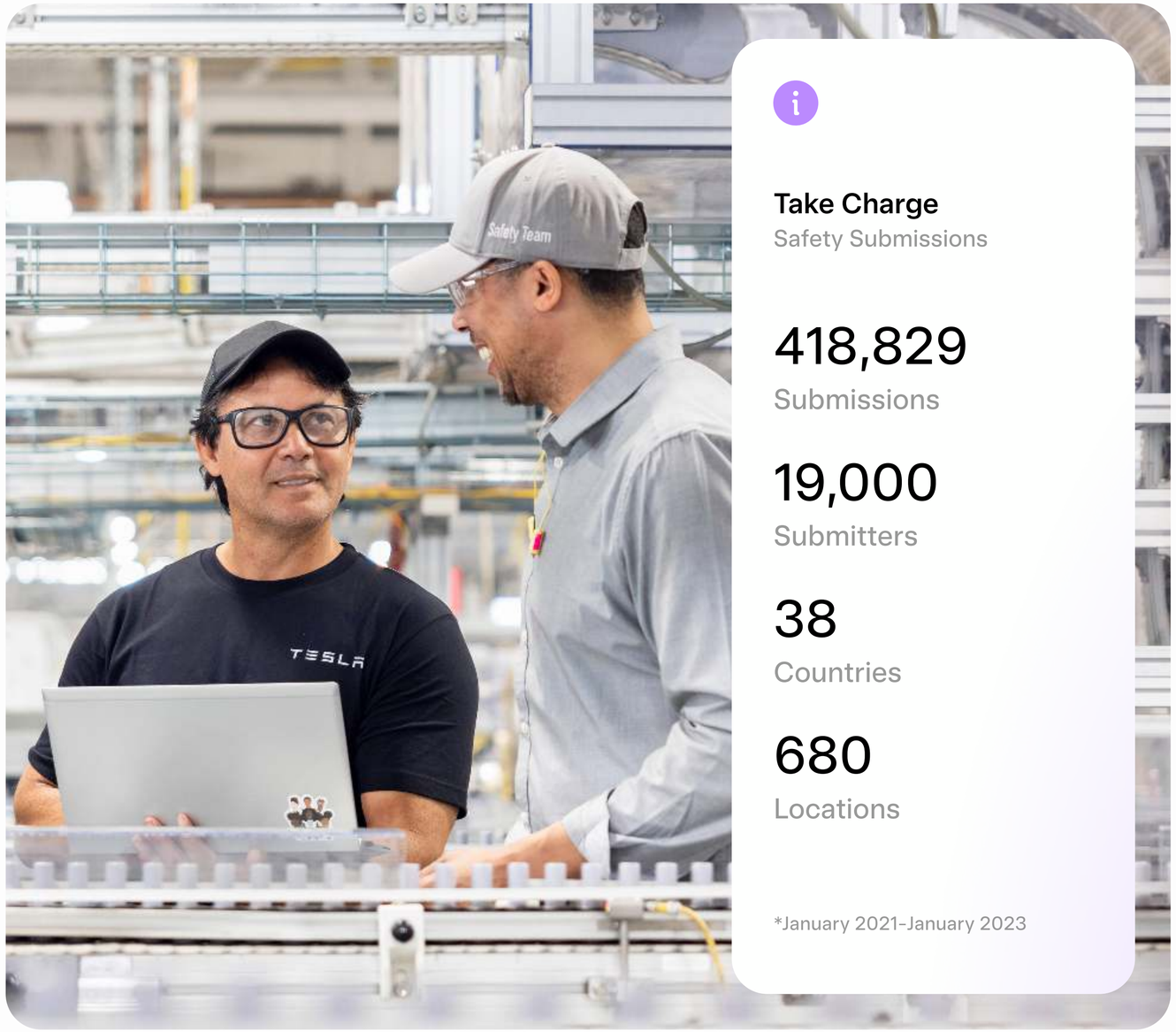
255,950,012
Hours

Our U.S. vehicle manufacturing DART rate is below industry averages (BLS industry DART rate 4.4. and BLS battery manufacturing DART rate 1.9)

We listen to our employees

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 or be owned at a cross-functional level.



Take Charge
Safety Submissions

418,829
Submissions

19,000
Submitters

38
Countries

680
Locations

*January 2021-January 2023

Empowering employees to identify improvements

Take Charge is a leading indicator for safety by engaging those closest to the work as well as their supervisors to establish a process to address issues proactively. Take Charge is owned by operations and integrated with Tesla's core operational values. To ensure integration, submissions are categorized into Safety, People, Accuracy, Rates and Cost (SPARC):

66%
Safety

7%
Rate

11%
People

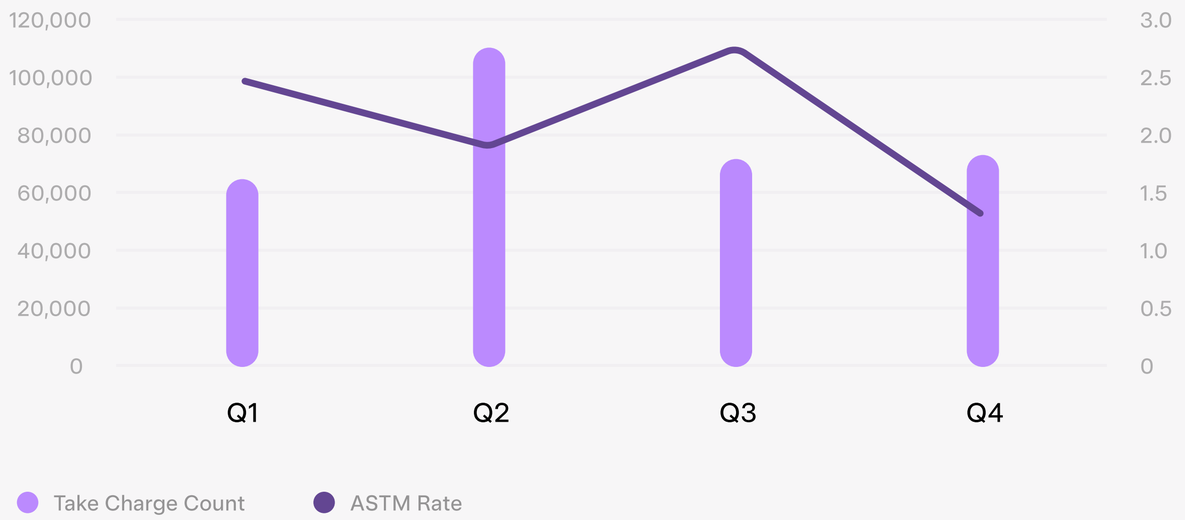
2%
Cost

4%
Accuracy (Quality)

8%
Other

Take Charge & ASTM Global Manufacturing

Submissions are inversely related to ASTM incidents



Human and Organizational Performance (HOP) Principles shape our safety journey

HOP enables leaders to develop systems that can tolerate errors and fail safely. It prioritizes making it easy for workers to do the right thing.

The HOP team formed in 2021 and spent 2022 investing in building tools and foundational programs to integrate HOP Principles into daily work. To be effective, we developed and deployed different depths of HOP Training for every level of the workforce.

82% of people leaders said that the HOP Training challenged their assumptions and traditional beliefs about safety.

28,060
people completed an online HOP intro course

968
leaders learned the HOP principles

156
EHS&S professionals completed in-depth training

20
employees are certified Global HOP Trainers

119
HOP employee tools and resources in our Find it Fast Library

20
EHS&S employees are new Learning Team Facilitators

56
Learning teams—46 events, 10 normal work

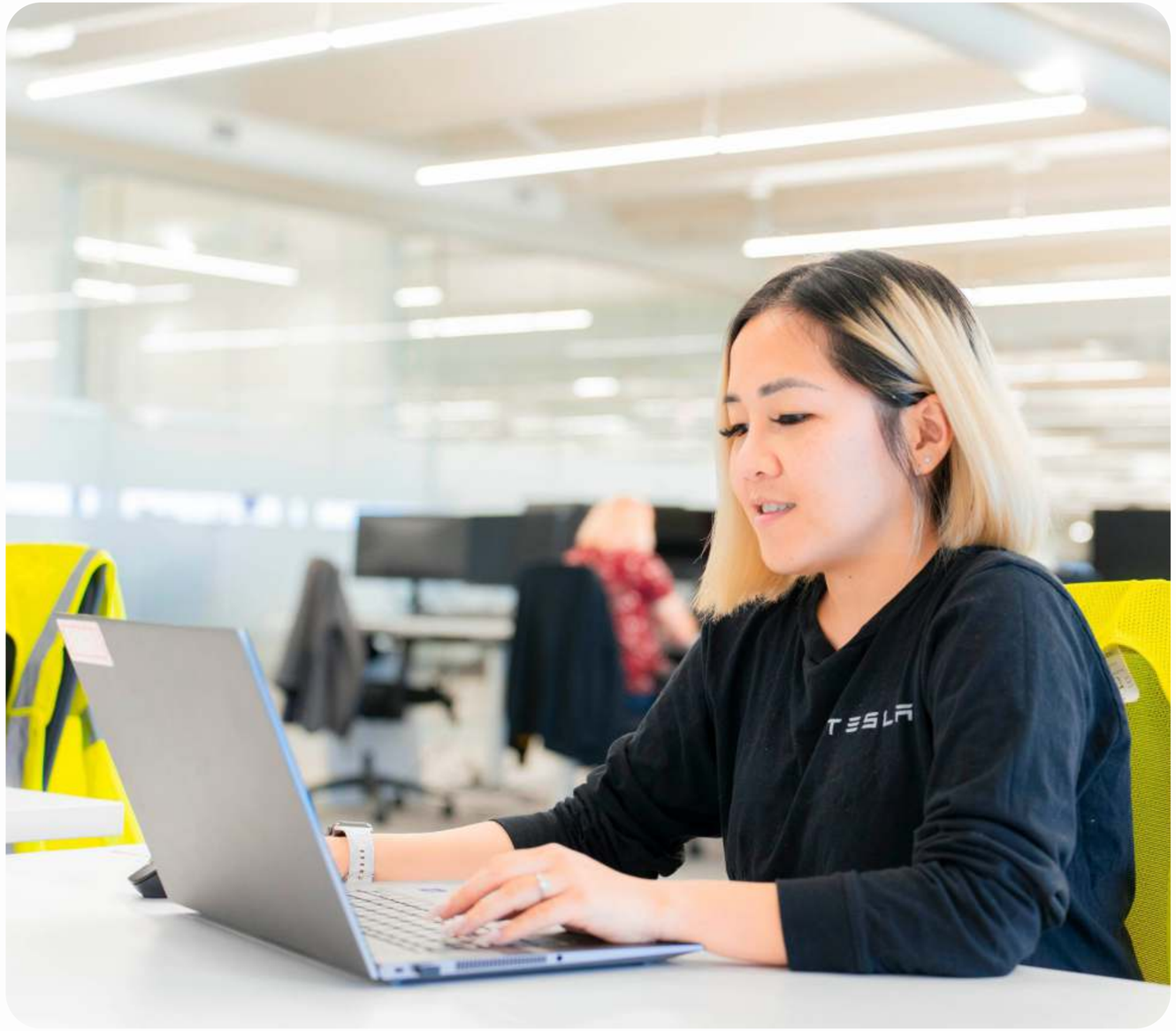
94%
of Learning Team participants would like to do it again

+80% find work personally rewarding and challenging

In 2022, we continued to gather employee sentiment around their work, culture, the leadership team, job satisfaction and career growth opportunities through our Employee Engagement Survey. We saw a 20% increase in participation globally from 2021.

In the company-wide engagement feedback, over 80% of respondents agreed or strongly agreed there are opportunities to learn and develop, find work personally rewarding and challenging and feel respected within teams.

The surveys indicated that our main strengths were belief in the mission and being proud to work at Tesla.



We are continuing to improve

The top three areas of opportunity identified by employees in our Employee Engagement Survey were Leadership, Engagement and Compensation. Leaders are actively creating action plans and are committed to addressing and improving these areas.



1 Leadership: Growth and Development

We launched an Upward Feedback program to engage leadership across the company as part of our performance management and employee sentiment processes.

Our programmatic approach to leadership development includes a robust training series from new leader onboarding fundamentals to continued learning, which focuses on:

- Management fundamentals
- Servant leadership
- Diversity, Equity and Inclusion (DEI)
- Communication that counts
- Leading through transitions
- Leading peers
- Coaching
- Interviewing with intention
- Recognition
- Behavioral self-assessment tool: Dominance, Influence, Steadiness and Conscientiousness (DISC)

2 Engagement: Shout Outs

Recognizing exceptional work is important. In 2022, we enabled employees to recognize the achievements, contributions or impact of their colleagues.

By creating Shout Outs on Inside Tesla, employees are now empowered to send meaningful recognition to teammates, direct reports and leaders anywhere in the company.

As part of this program, we also highlight engagement in key programs such as safety improvements or vehicle delivery volunteering and track career milestones.

3 Compensation

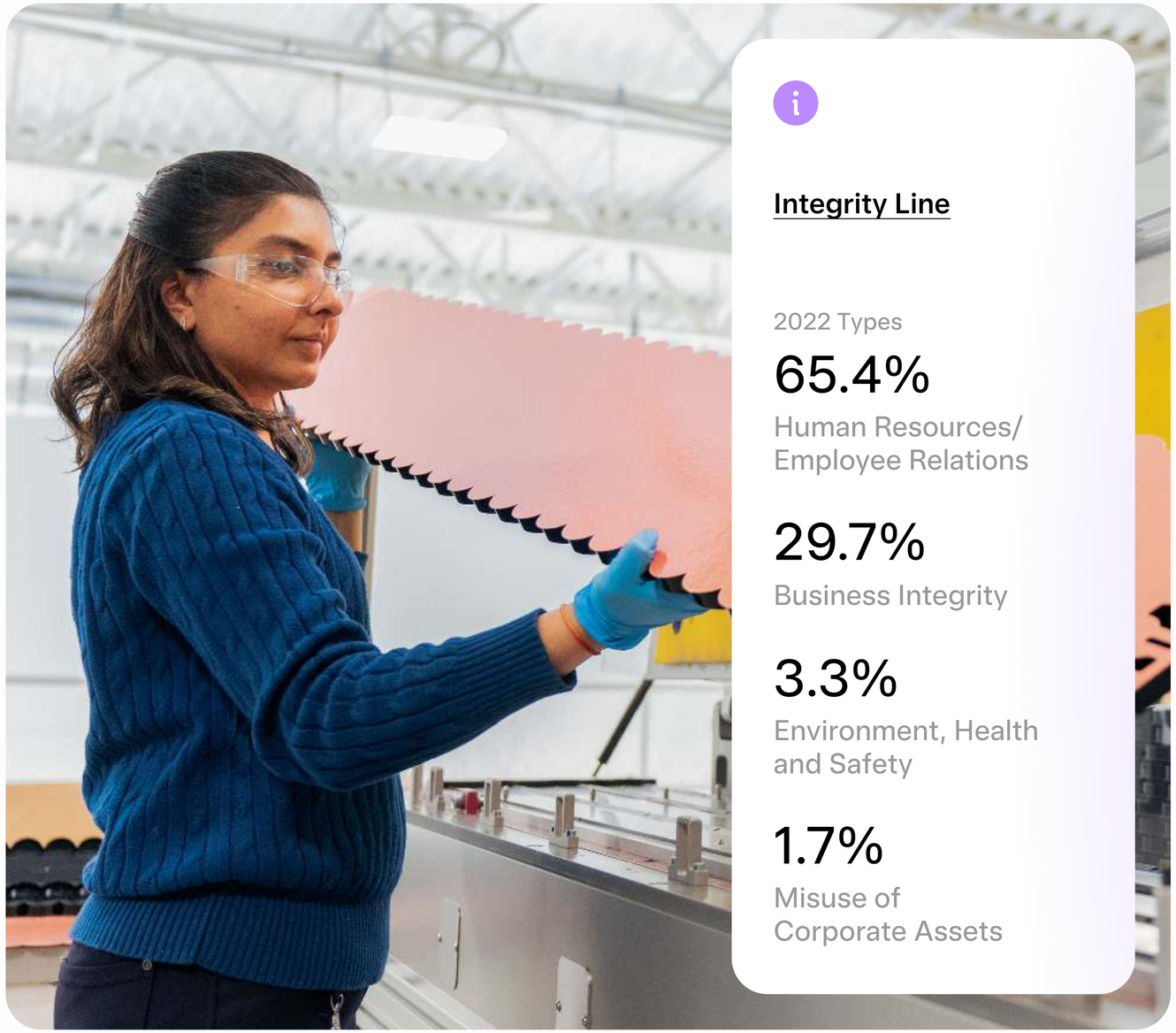
Learn more about how we address compensation on page 123.

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.



Integrity Line

2022 Types

65.4%
Human Resources/ Employee Relations

29.7%
Business Integrity

3.3%
Environment, Health and Safety

1.7%
Misuse of Corporate Assets

We do not tolerate harassment and discrimination

As we grow, we continue to address challenges head on. From day one in New Hire Orientation, employees learn about Tesla's respectful workplace.

Each employee is required to take Code of Business Ethics and Anti-Harassment Trainings. These trainings are part of Tesla's new global hire onboarding process and training is completed on an ongoing basis.

Management regularly checks completion rates and follows up to ensure each employee completes all required trainings.



Inclusion is everyone's responsibility

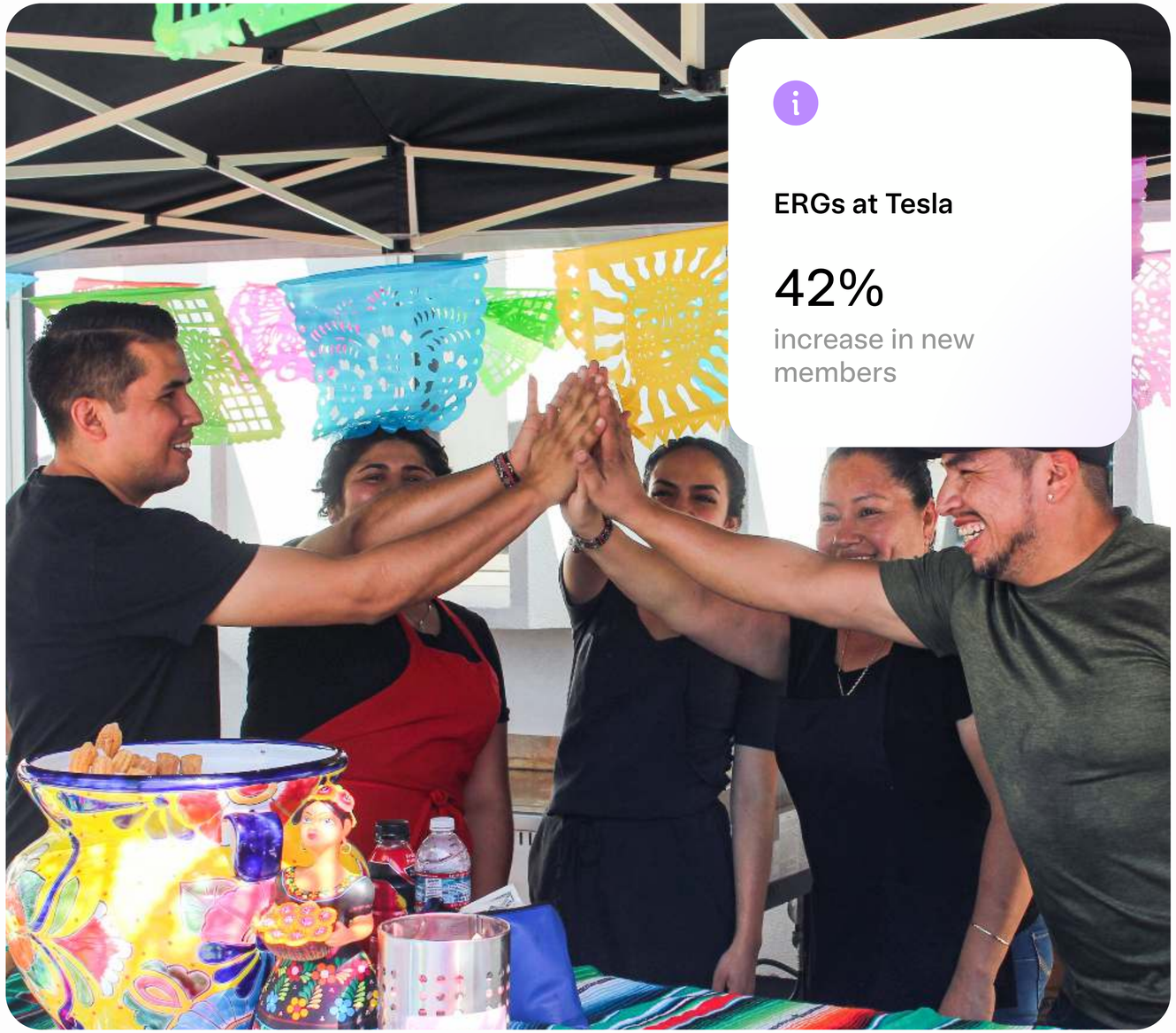
From day one during onboarding, employees are exposed to our Diversity, Equity and Inclusion (DEI) principles and are encouraged to join Employee Resource Groups (ERGs)—led by passionate individuals who care about creating a strong community experience within Tesla.

Our ERG events and opportunities focus on career development, cultural appreciation, community building to promote inclusion, help with retention and diverse recruiting. We saw a 42% increase of new members into our various ERGs from 2021.

In 2022, we launched a nationwide internal DEI newsletter reaching all people managers and HR team members.

ERGs:

Asian and Pacific Islander (API@Tesla)
Black at Tesla (BAT)
Latinos at Tesla (LAT)
LGBTQ+ (LGBTQ+@Tesla)
Women in Tesla (WIT)
Veterans at Tesla (Vets@Tesla)



ERGs at Tesla

42%

increase in new members

65+ employee resource group events



Hispanic Heritage Month

20 events across all major locations in the U.S. and Germany impacting nearly 6,000 employees



Pride

Participation in 5 Pride Parades (San Francisco, Reno, Fort Lauderdale, Buffalo and Mexico City)



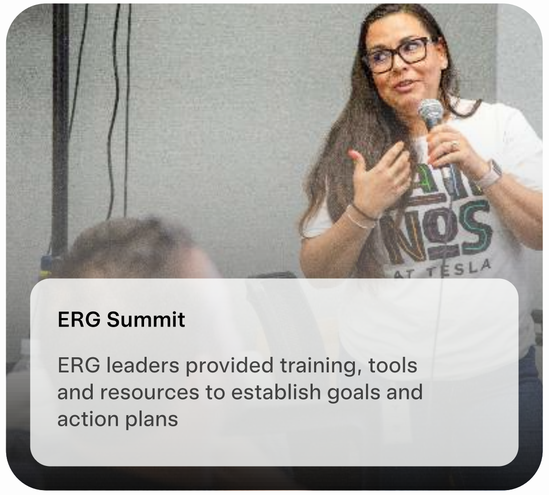
Black at Tesla

Navigating Your Career series on professional development and career advancement



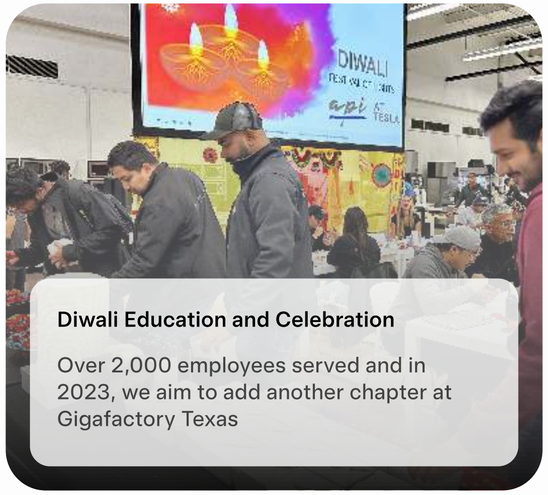
Juneteenth Events

Juneteenth Celebration: The History Behind Freedom Day, Coping With Distressing Current Events



ERG Summit

ERG leaders provided training, tools and resources to establish goals and action plans



Diwali Education and Celebration

Over 2,000 employees served and in 2023, we aim to add another chapter at Gigafactory Texas



Veterans at Tesla

All-hands town hall, 2 Veterans Day parades, mentorship and buddy check program



Women In Tesla

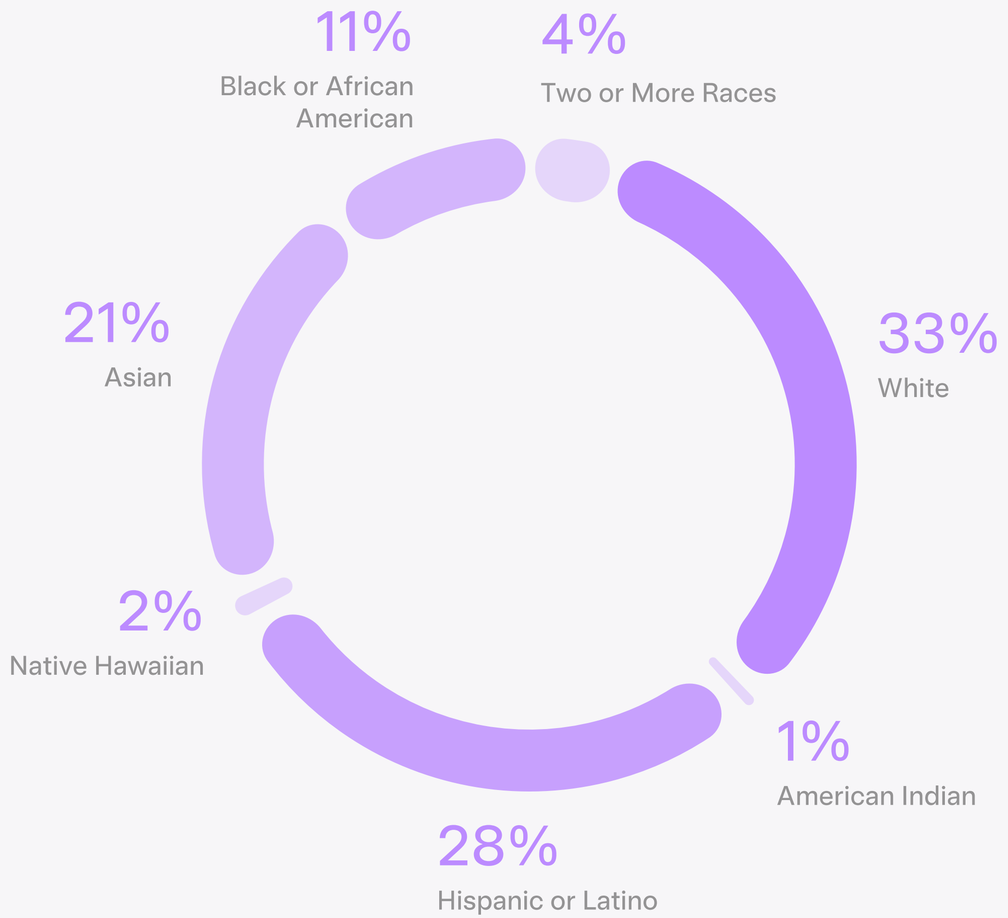
Chapters across the U.S., Germany, Australia, New Zealand and Japan hosted region-specific events

We are a majority-minority company with 67% of U.S. employees from underrepresented groups

We are proud to be a majority-minority company with a large representation of employees from communities that have long struggled to break through the historic roadblocks to equal opportunity in the U.S.

In 2022, we continued with regular diversity data reviews across our organization with the goal of attracting, developing and retaining talent.

Executives review demographic data for their organizations and work on action planning with a team that includes their DEI business partner, HR business partner and recruiter.



We are focused on developing diverse talent

Comparing our diversity data with that of other tech and automotive companies based in the U.S., Tesla's representation of people of color exceeds that of peer companies in nearly all categories.

We are focused on developing diverse talent and supporting their growth into leadership roles. Our recruiting efforts focus on increasing minority representation both in gender and for people of color in professional and managerial categories.

In particular, to increase gender representation throughout the company, we support women-focused organizations and conferences in addition to community engagement and ERG work focused on increasing and supporting women in STEM.

Learn more on pages 210-213 in the appendix.

In Comparison to Auto Industry

+33%

Underrepresented groups in total

+24%

Underrepresented groups in Exec/Sr. Officials & Mgrs

+22%

Asian representation in Exec/Sr. Officials & Mgrs

+23%

Hispanic/Latino representation in total

In Comparison to Tech Industry

+16%

Underrepresented groups in total

+9%

Underrepresented groups in Exec/Sr. Officials & Mgrs

+20%

Hispanic/Latino representation in total

+5%

Black/African American representation in total

71% of our people leaders come from internal promotions

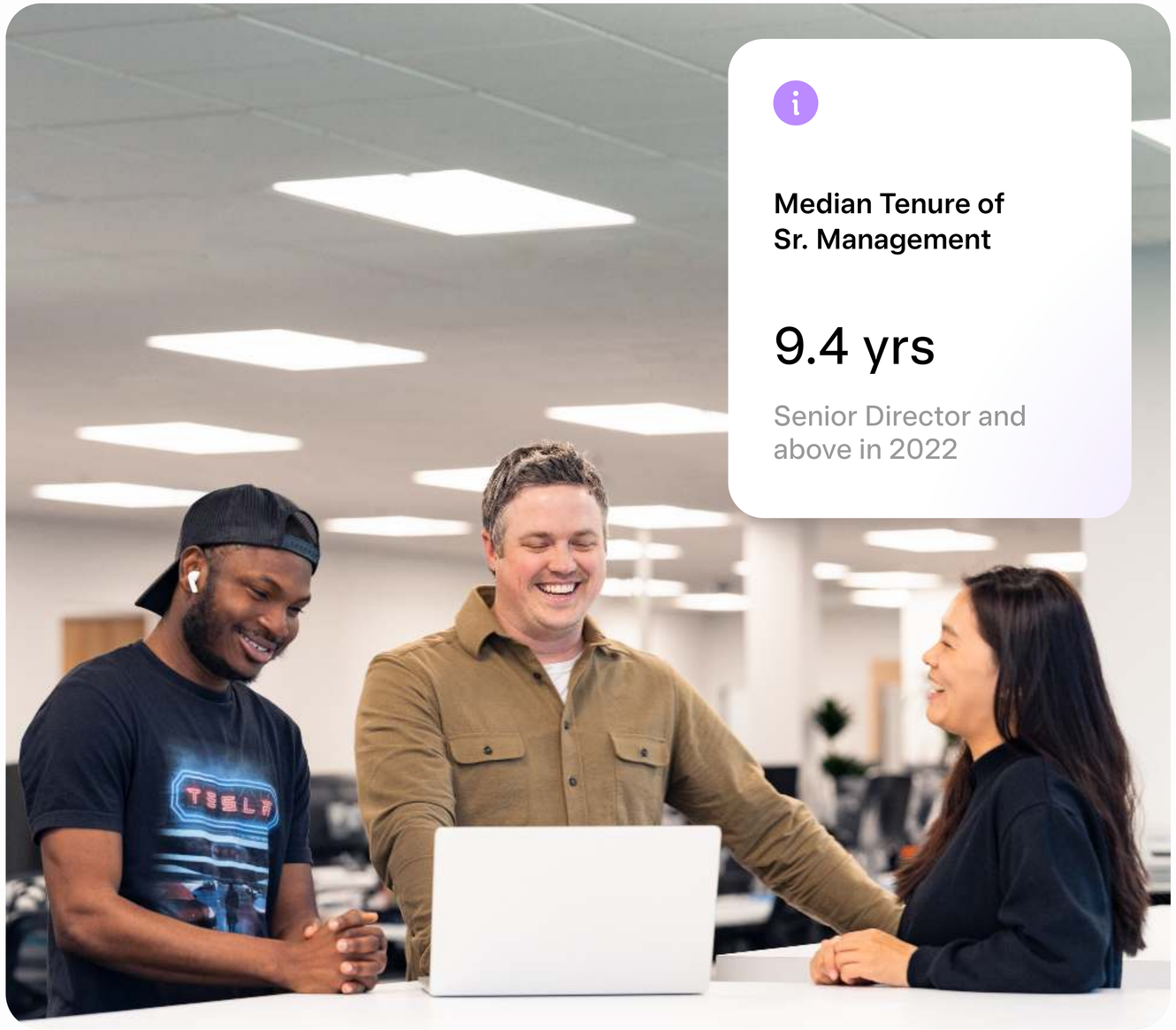
In 2022, over 9,000 employees initiated internal transfers and over 1,100 of those employees transitioned into leadership roles—with 40% of first- and mid-level officials and manager promotions coming from underrepresented groups.

M-Level Promotions

2021	2022
1,231	1,350

Total Internal Transfers

2021	2022
6,625	9,912



Median Tenure of Sr. Management

9.4 yrs

Senior Director and above in 2022

4.3 Compensation

We invest in our employees.



Our health programs promote employee wellbeing

We offer no-cost paycheck contributions for medical, dental and vision plan options for employees and family members—plus employer-paid life, 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. In 2022, we expanded our benefits programming to include 401k contribution matching and a benefits concierge service for LGBTQ+ employees.

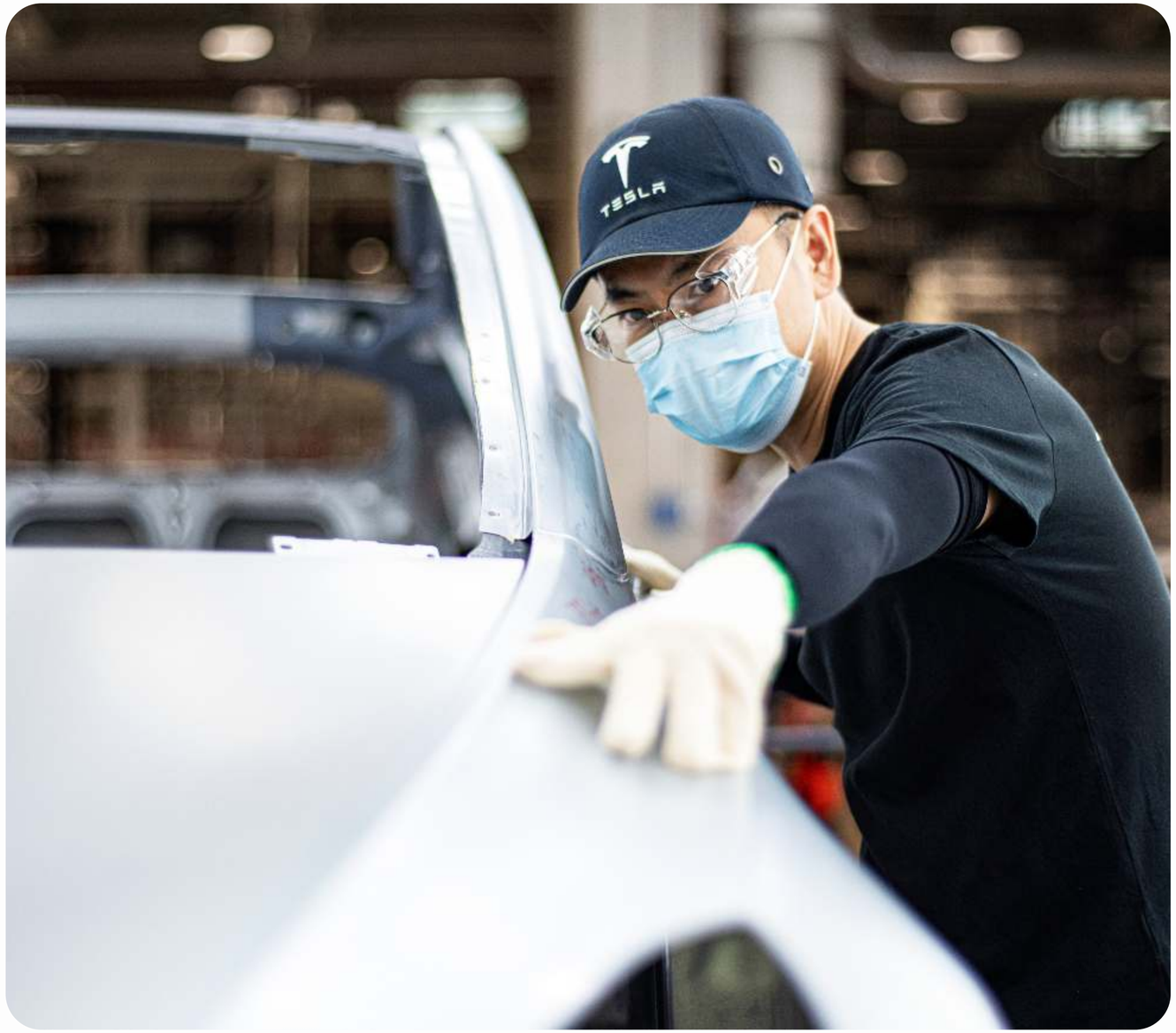


We don't believe in a one-size-fits-all approach to employee support programs

We implemented pilot programs—like the Mental Health First Aid and Employee Assistance Program (EAP) education and training pilot in Australia—aimed at increasing our positive impact, minimizing our negative impact and collaborating with general workforce health.

At Gigafactory Shanghai, we provide regular health seminars for our employees. We also hire a professional physiotherapy team to solve various physical habit problems.

The Employee Assistance Program supports employee mental health, providing a 24/7 mental-care hotline to employees and their family members at zero cost. They also offer access to the Mental Care Training Program and First-Aid Messenger Training Program.



U.S. benefits

SafetyNet

Limited financial assistance for employees experiencing temporary hardship

Back-Up Care

Five days of back-up child care or elder care for employees

Employee Perks

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

Rethink

Resources for families with children who have learning, social or behavioral 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

As stock owners, every employee has a stake in the success of Tesla.



We're all in it together

Our greatest asset is our people and 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.

Share Price (USD)





Employee Stock Purchasing Program (ESPP)

Our employees can purchase Tesla stock at a discount—regardless of role or seniority—through the ESPP.

Enrollment in ESPP is easy—with an internal site, stock admin team and support through the administrator. ESPP is open for enrollment for the whole month of February and August. Employees can change their mind and withdraw at any time.

Shared ownership enables our diverse talent access to economic opportunities that enable wealth generation stemming beyond their time at the company.



Manufacturing role compensation

We provide a competitive wage that meets or exceeds the wages of comparable manufacturing roles, even before equity and benefits are factored in.

In 2022, Tesla's average national wage for manufacturing jobs in the U.S. was $22.98 per hour, which is a 6.4% increase compared to 2021. When including overtime and equity, that number goes up to $27.52 per hour. No-cost health plans with $0 cost paycheck deductions are valued at an additional $4.76 per hour, bringing the average effective per-hour pay for manufacturing roles to $32.28.

According to the Bureau of Labor Statistics, the mean hourly wage for Production Associates / Assemblers is $18.75 and the median is $17.87. Tesla continuously reviews salary and wages against benchmarks and adjusts to ensure wages are competitive. Evaluations for promotions also take place annually.



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:

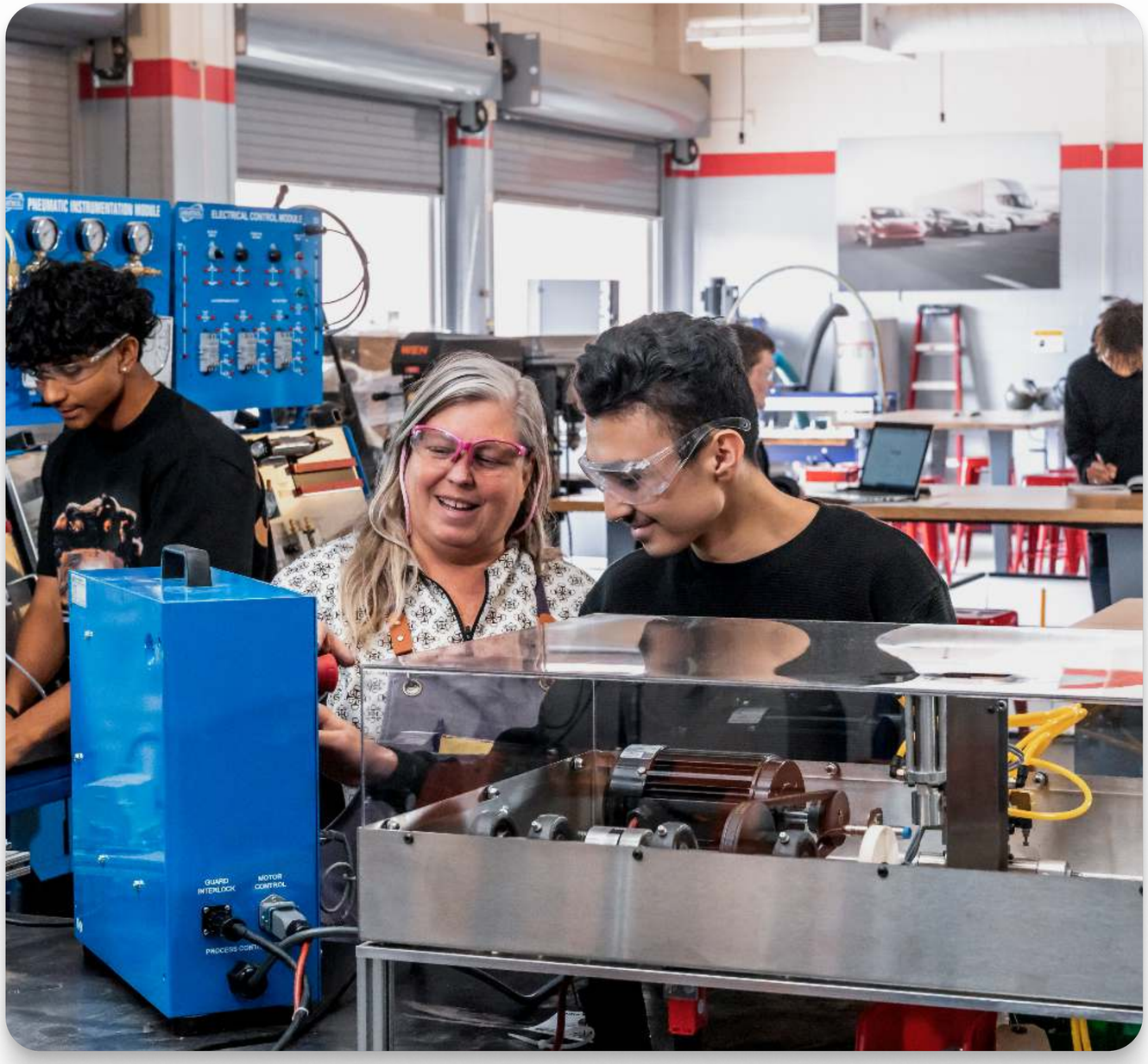
- Geographic zone
- Tenure (which determines how many grants are in the process of vesting)
- Average performance score
- Job function
- Management level and role

HR also offers a Pay Equity & 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.



4.4 Social Impact

We engage in our communities.

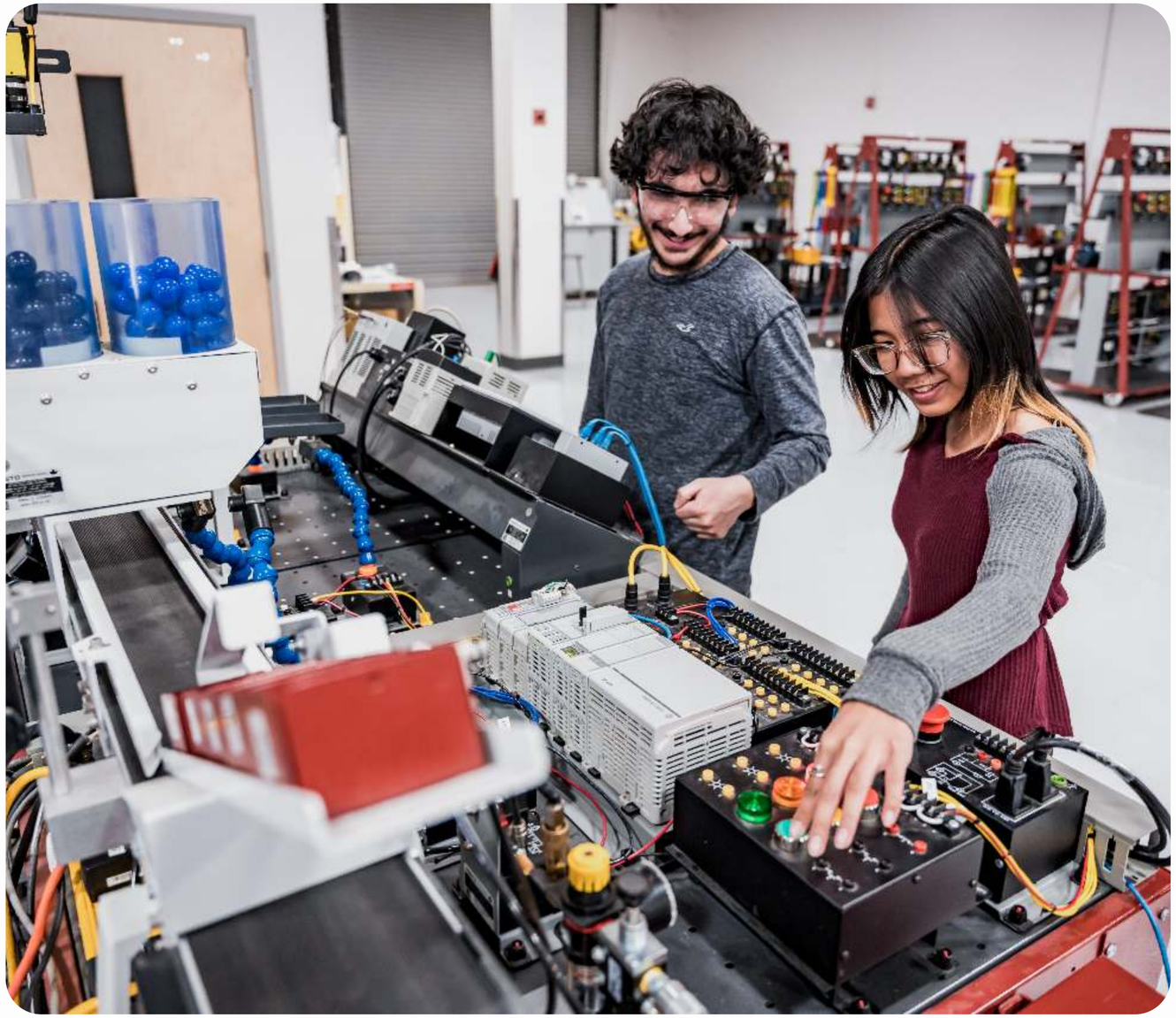


Tesla in the community

At Tesla, 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.

Our pillars

- Education
- Workforce Development
- Sustainability



Inspiring the next generation of Tesla leaders

Education

We engage and inspire young people through STEM-focused programs and events. By providing resources and support to underrepresented communities, we are preparing them for careers and energizing them to become the next generation of Tesla leaders.

$37.5M K-12 education commitment in Nevada

Our commitment provides support to over 4,100 students to participate in competitive robotics, and thousands more participating in robotics in-class learning.

- 13 Tesla Robotics Labs complete or near completion
- 2,500 teachers trained in computer science by Code.org
- 1,200 sq. ft. open-source, bilingual museum exhibit
- 30+ teacher externships hosted

Introduce a Girl to Engineering Day

Introduce a Girl to Engineering Day is a movement focused on inspiring and encouraging girls to explore impactful careers in engineering and STEM. Since 2018, Tesla has brought middle school girls into their factories, offices and showrooms. Girls gain insight into various career pathways and learn from women at Tesla. This year's event brought together over 1,400 students from across 39 states for a fun and engaging learning experience. Gigafactory Berlin has also joined in the celebration by hosting Girls' Day for the last three years.



Manufacturing Day

Tesla celebrates Manufacturing Day each year on the first Friday of October. The event highlights advanced manufacturing at Tesla across North America. This exposure shows young people the opportunities available to them when pursuing a career in the industry. In 2022, participation increased by over 50% and saw students across 35 states and 4 countries join to learn about Tesla's mission, explore opportunities in advanced manufacturing and find out how workforce development programs could give them a jump start on their careers.



Creating pathways to career opportunities

Workforce development

To make a positive impact, we need to create a talented and engaged workforce with ample opportunity to contribute to our mission and grow professionally.

We are focused on creating pathways to career opportunities internally across Tesla through strategic initiatives such as:

Internships & Apprenticeships

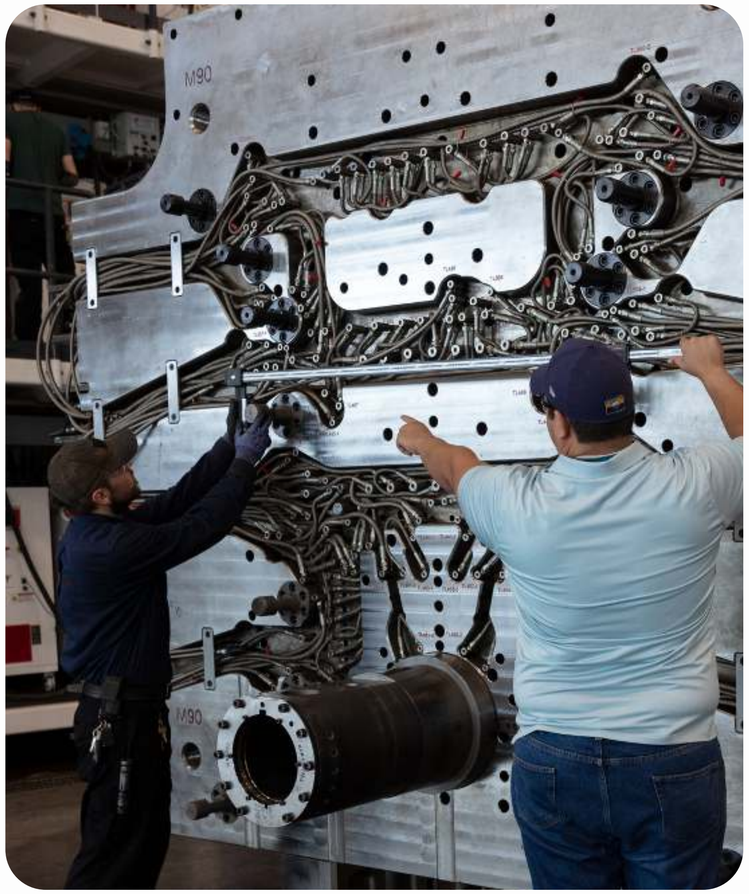
Over 3,000 university and community college students from around the world are hired for internship and apprenticeship opportunities at Tesla annually. We recruit from over 100 collegiate institutions and diverse student organizations, attracting top talent passionate about accelerating the world's transition to sustainable energy.

Tesla START

Tesla START is an intensive training program providing individuals with the skills necessary for a successful technician role at Tesla. We partner with 12 colleges across the country to integrate Tesla START into automotive, collision and manufacturing curriculums that provide individuals with a smooth transition from college to full-time employment. In 2022, we had over 200 graduates from Tesla START programs, with an additional 100+ graduating in the coming weeks from our winter classes.

High School Graduate Pathways

Tesla's 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. Since its launch in 2017, we've hired over 300 graduates into this program.



Supporting the communities we work in

Sustainability

We build environmental equity through our people, products and programs. With this lens, we select the communities in which we operate and provide opportunities for employees to engage in the communities in which they work.

Tesla Impact

Since the employee volunteer program began in 2020, it has been growing rapidly with participation more than doubling year to year. This past year, volunteers engaged in events year-round, including major initiatives held on Earth Day in April and during the Week of Service in October.

+$840K value of Resiliency Project in Oakland, CA

EV Charging Donations

In 2022, Tesla continued to enable access to EV charging infrastructure in local communities by partnering with local organizations that have a direct presence in their communities to donate Level 2 EV charging equipment. Tesla engaged with over 20 diverse partners serving disadvantaged communities across the country and new Tesla factory locations.

Clean Energy & Resiliency Project at Allen Temple Baptist Church

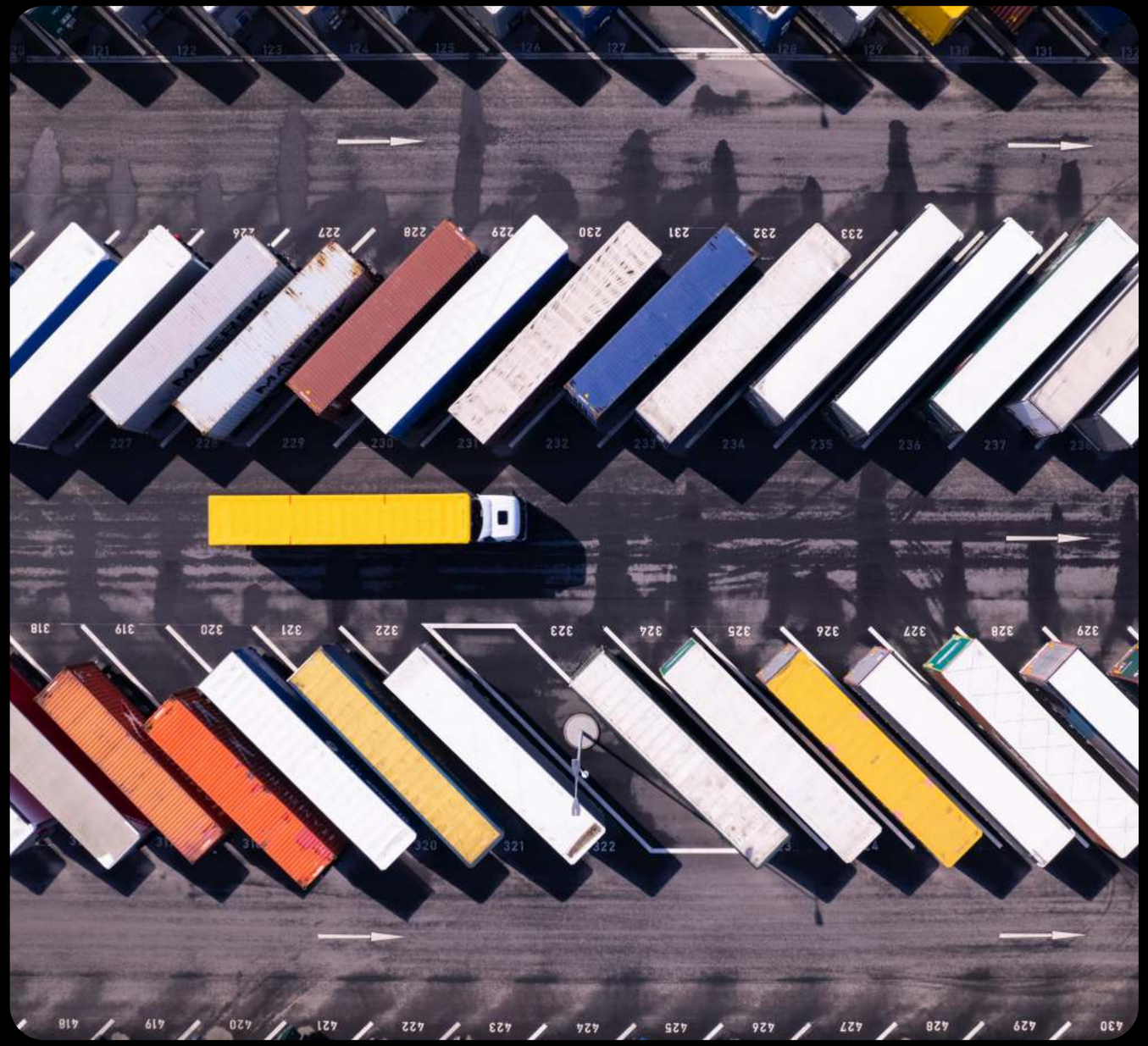
Tesla partnered with Allen Temple Baptist Church and Green The Church on a clean energy and resiliency project in Oakland, California. The project, valued at $844,949 and requiring over 1,650 in-person hours to be completed, included 90 kW of solar and an energy storage system of 464 kWh at the church's Family Life Center. The church noted that Tesla's investment would yield more than $285,000 in electricity savings over the next ten years.



05

Supply Chain

WE SOURCE FROM SUPPLIERS THAT RESPECT HUMAN RIGHTS AND PROTECT THE ENVIRONMENT



Our Approach
139-145

Battery Supply Chain
146-163

Priority Materials
164-185

Data Systems
186-191









800+
suppliers engaged in responsible sourcing

12
materials with increased visibility

3X
increase in direct supplier audits

3
GHG hotspot analyses completed to cover our cathode chemistries

1st
worldwide Battery Passport piloted

5.1 Our Approach

We source responsibly.



Working directly with companies in our supply chain

Some of Tesla's parts suppliers are close to factories, while others are part of complex global supply chains. Wherever they may be, we are committed to ensuring our suppliers respect human rights and protect the environment.

We maximize the positive impact of our supply chain for people and the planet as we accelerate the world's transition to sustainable energy.

We work on-site with our suppliers to help improve conditions through programs like our Supplier Industrialization Engineering (SIE) program, our Corporate Social Responsibility (CSR) audit and continuous improvement programs.



Our 2022 Program Highlights

Engagement

Engaged with 800+ suppliers on environmental and social topics, proactively and directly

Expectations

Added stricter supplier expectations in our contracts and policies

Tracking

Increased measurable improvement on environmental and social issues in our supply chain

Visibility

Increased visibility into 12 material supply chains

Audits

Tripled the number of direct supplier audits and maintained the number of battery supply chain audits

Production Control

Increased the amount of material directly sourced from nickel, lithium and cobalt producers

Remaining engaged to promote responsible sourcing

When we become aware of a risk in our supply chain, we assess and work with the appropriate parties to address it.

Disengaging because of a potential risk can have unintended socio-economic consequences for local communities. We believe the best way to promote responsible sourcing is to remain engaged and encourage corrective actions. In instances where supply chain actors present an unwillingness to improve, Tesla will consider removing them.

Governance

Our responsible sourcing team is strategically embedded into our supply chain organization and our efforts are overseen by executives from Supply Chain, Investor Relations and Policy. We regularly report on progress to these executives and a committee of representatives from Compliance, Environmental Health and Safety, Global Trade Compliance, Internal Audit, Legal, Policy, Sustainability and more.

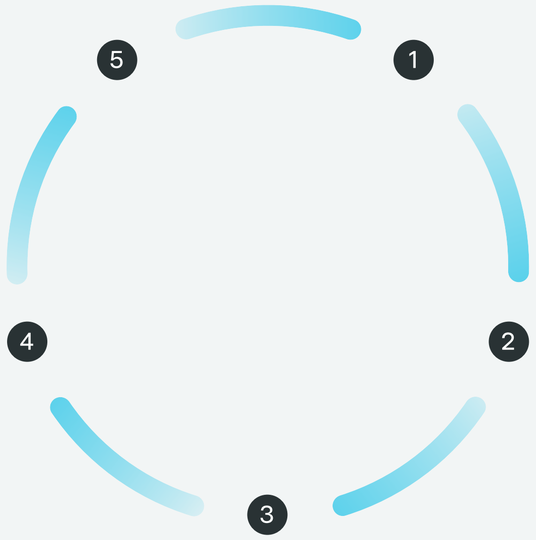


We align with industry best practices

We source responsibly according to the Organisation for Economic Co-operation and Development (OECD), Responsible Business Conduct (RBC) Framework, the OECD Due Diligence Guidance for Responsible Mineral Supply Chains and the United Nations Guiding Principles (UNGPs) on Business and Human Rights. As risks evolve, we continually review our approach to due diligence with the goal of improving our efforts to identify and mitigate risk as well as have the same expectations for our suppliers.

Policies applicable to all suppliers and embedded into the General Terms and Conditions:

1. Tesla Responsible Sourcing Policy*: Tesla's public commitment to responsible sourcing
2. Tesla Supplier Code of Conduct: Tesla's expectations for our suppliers
3. Global Human Rights Policy*: Tesla's commitment to uphold respect for human rights—training on human rights in recognition of Human Rights Day held on Dec 11, 2022



1 Maintain Strong Policies & Management Systems

2 Collect & Investigate Supply Chain Environmental & Social Risk Data

3 Implement Risk Mitigation Measures in Priority Engagement Areas

4 Collaborate With Industry Initiatives

5 Disclose in the Impact Report

*Updated in 2023

Forced labor and responsible sourcing

Forced labor prevention, identification and remediation are a priority for Tesla. We take any allegations of forced labor in our supply chain seriously and work diligently to uphold respect for freely chosen employment while reducing our respective risk exposure.

Combatting forced labor requires the establishment of minimum standards that all suppliers must comply with, incorporating all applicable legal requirements, as well as the setting of high expectations our entire supply chain shall work toward. We have established a management system that effectively drives the development and implementation of our efforts to combat forced labor.

We have established tools and processes for the early detection of forced labor and implemented due diligence procedures to monitor potential risk indicators and help prevent abuses at our suppliers. Our approach includes the following:

Clear supplier expectations

We set comprehensive policies and robust procedures to help ensure that no one in our supply chain is forced to work. Our Global Human Rights Policy, Supplier Code of Conduct and Responsible Sourcing Policy outline our commitments and supplier expectations related to forced labor, which are further enforced through the contractual agreements with our suppliers.

Internal training

On International Human Rights Day, we established an internal training program to educate employees on the salient issue of forced labor. The training provided employees with a concrete toolkit to identify signs of forced labor during supplier visits and nearly 1,000 Tesla supply chain and engineering employees attended.

International Labor Organization (ILO) Forced Labor Indicators

Debt bondage

Restriction of movement

Withholding wages

Retention of ID documents

Abuse of vulnerability

Deception

Abusive living and working conditions

Physical and sexual violence

Intimidation and threats

Excessive overtime

Isolation

Implementing best practices

Customs Trade Partnership Against Terrorism (CTPAT)

Tesla joined the CTPAT program in July 2019. In September 2022, the U.S. Customs and Border Protection (CBP) met with Tesla management and internal stakeholders from across the organization to validate that we are meeting the minimum security criteria established for the program. CTPAT members are required to have a documented social compliance program in place that, at a minimum, addresses how the company ensures goods imported into the United States were not mined, produced or manufactured, wholly or in part, with prohibited forms of labor, i.e., forced, imprisoned, indentured or indentured child labor. Through CTPAT, we have engaged with the CBP and the Department of Homeland Security's Center for Countering Human Trafficking to educate them on sourcing patterns for commodities at high risk for forced or trafficked labor. In CBP's February 2023 Validation Report, CBP commended Tesla for "commit[ting] significant resources to ensure that their supply chains and business partners meet ethical sourcing and labor requirements" and recognized the processes we have in place to screen business partners as a best practice—"outstanding in both scope and depth."

Collective efforts

We engage with multi-stakeholder working groups, such as those within the Responsible Business Alliance and its associated Responsible Labor Initiative.

For more information, please see our California Transparency in Supply Chain Acts Statement and our U.K. Modern Slavery Act Transparency Statement.

Worker Voice

Learn more about our new worker voice mechanism on page 111.

Identification of forced labor indicators

- Mapping of our supply chain wherever feasible
- Verifying the relationships between Tesla and upstream suppliers
- Understanding suppliers' existing policies and management systems related to forced labor
- Requiring suppliers undergo third-party audits, including International Labor Organization indicators of forced labor
- Requiring suppliers implement corrective action plans for gaps in their efforts
- Acting on worker voices in our supply chain: see Worker Voice section
- Reviewing information from credible external sources, such as government agencies and NGO reports
- Implementing targeted assessments of suppliers with a higher risk of forced labor
- Incorporating third-party research into our due diligence on suppliers

5.2 Battery Supply Chain

We measure upstream emissions.



As a key step to decarbonizing our supply chain, we collect GHG data from our suppliers

Emissions from purchased goods and services are categorized as Scope 3 emissions by the GHG Protocol.*

Managing supply chain emissions is critical for our continued journey to accelerate the world's transition to sustainable energy.

*Governed by World Research Institute and World Business Council for Sustainable Development

Supply Chain Emissions

30–50%

of the total lifecycle GHG emissions of a Tesla vehicle

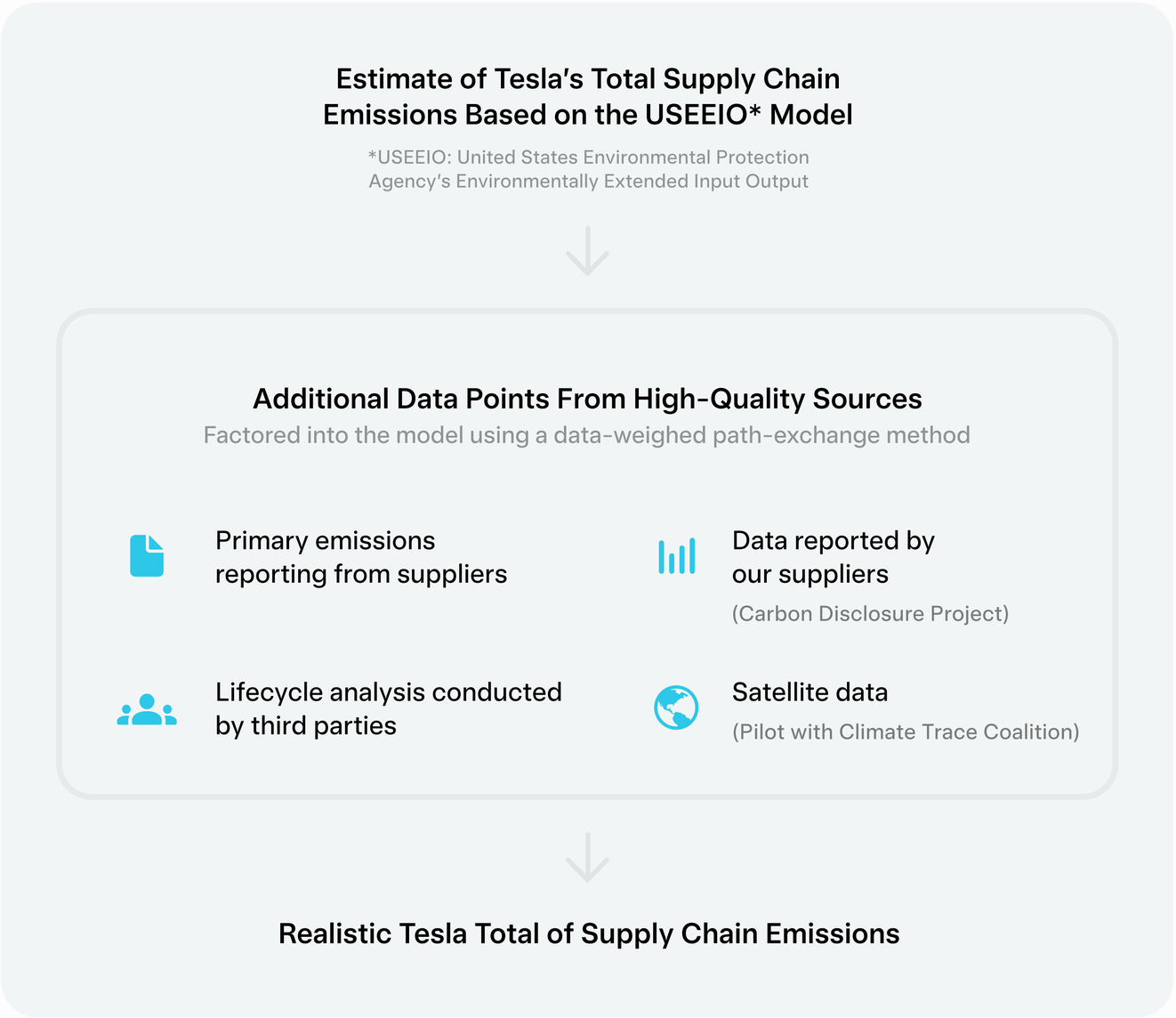


Building a system that avoids undercounting supply chain emissions

Historically, company supply chain emissions have been significantly undercounted due to the complexity of engagement, data availability, data consistency and differences in reporting boundaries.

We recognize that we can no longer assume that a missing data point should equate to zero emissions. To take steps to significantly reduce our impact, we must understand the true emissions footprint of our supply chain.

Our methodology aims to balance data quality with data availability to give the most complete and accurate picture possible. We use a systematic approach to quantify the emissions by incorporating data from multiple high-quality sources.

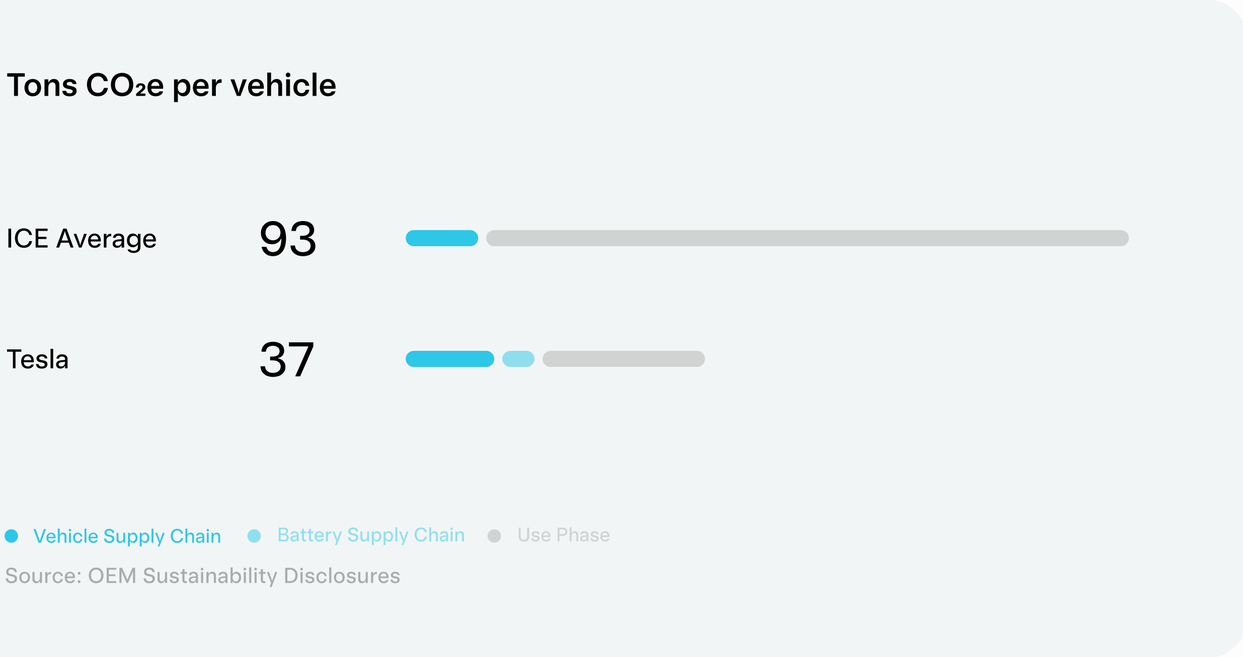


An EV's lifetime CO_2e is less than a comparable ICE vehicle

With today's electricity grid, an EV's supply chain emits approximately four tons more than a comparable ICE vehicle's supply chain. This is mostly due to the emissions associated with an EV's battery; however, this upfront "investment" of CO_2e gets paid back after approximately two years of driving the vehicle.

After that, an EV's lifetime CO_2e is less than a comparable ICE vehicle, ultimately resulting in ~55 tons of CO_2e savings over the lifetime of the EV. This savings will only get better over time as the EV supply chain and the grid used to charge EVs get cleaner through technological innovation, renewable energy deployment and increases in recycled battery materials.

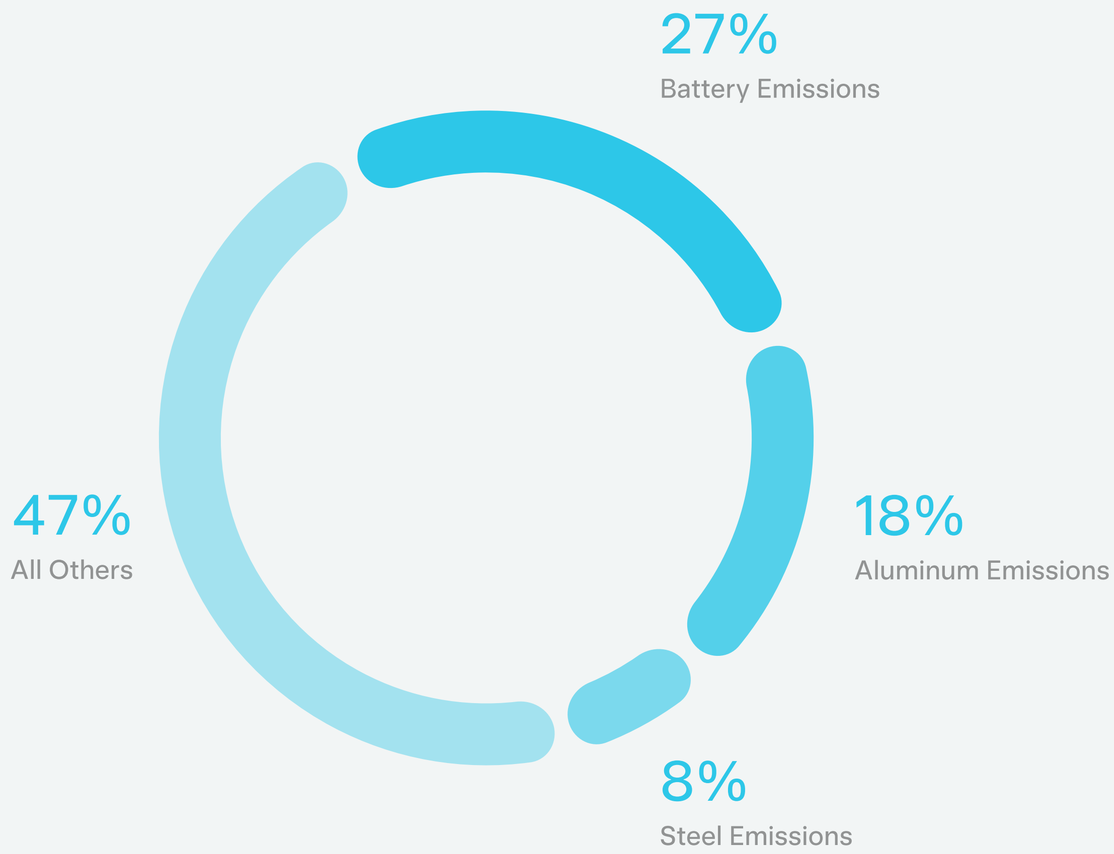
55 tons of CO_2e avoided



Reporting Tesla's 2022 Scope 3 Emissions (Category 1, 4)*

*Categories are: (1) purchased goods and services, (4) upstream logistics

For specific efforts on how to calculate and reduce GHG emissions in the battery supply chain, see pages 156-159.

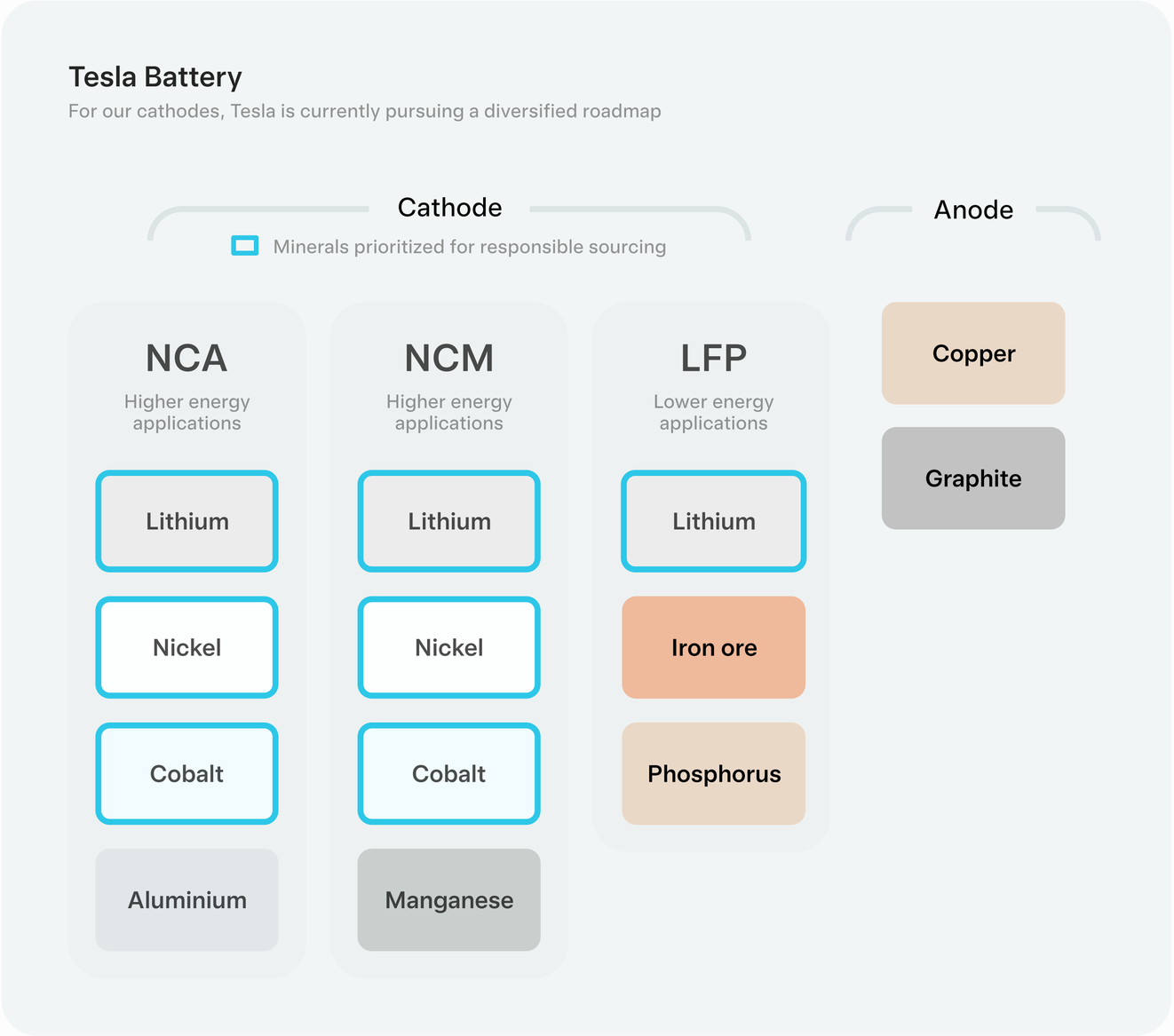


Our batteries rely on critical minerals

Batteries drive Tesla's sustainability mission. Our cathodes and anodes contain critical minerals like lithium, nickel, cobalt, copper, graphite, manganese, iron and phosphorus.

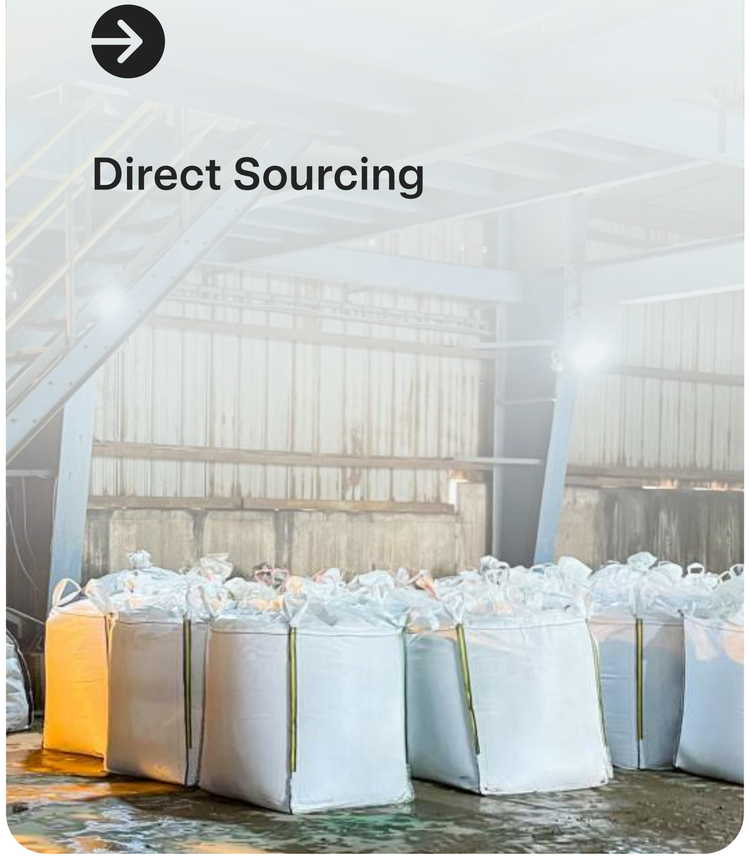
Lithium, nickel and cobalt play an essential function in improving vehicle range and safety performance. While the relative amount of minerals needed for each cathode chemistry varies, Tesla's cell production growth rate will increase our demand for primary mined minerals—these are essential for the transition to sustainable energy.

$ Significant part of battery cell costs = lithium, nickel and cobalt

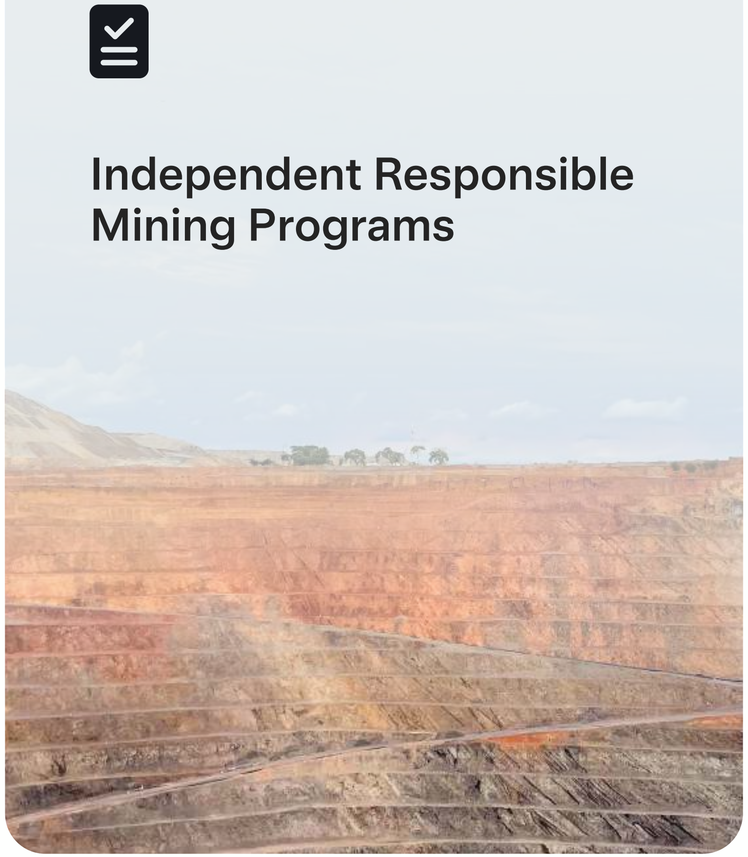


Our responsible mining and refining initiatives

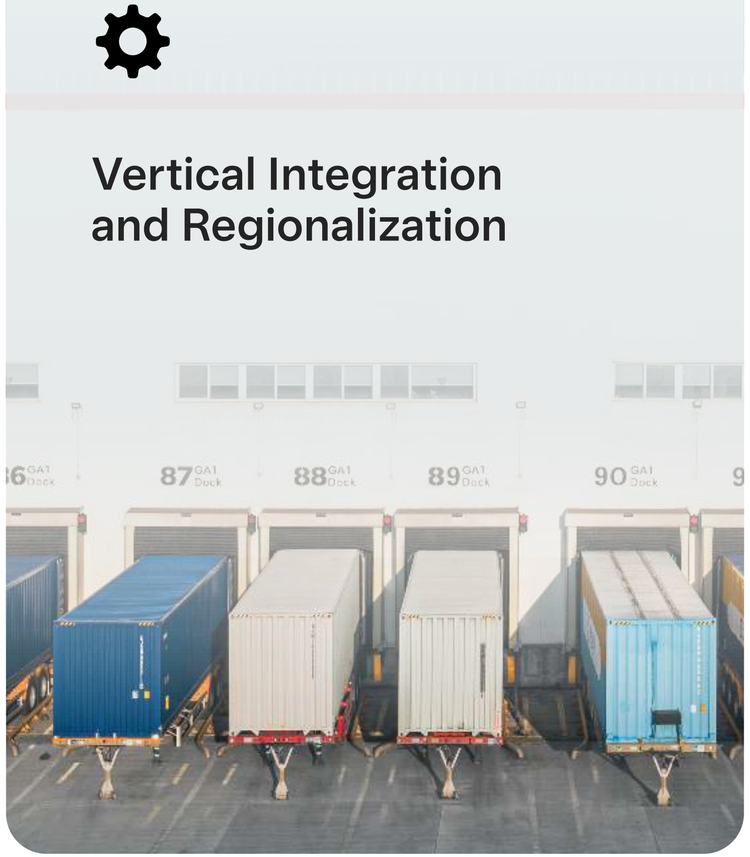
Direct Sourcing



Independent Responsible Mining Programs



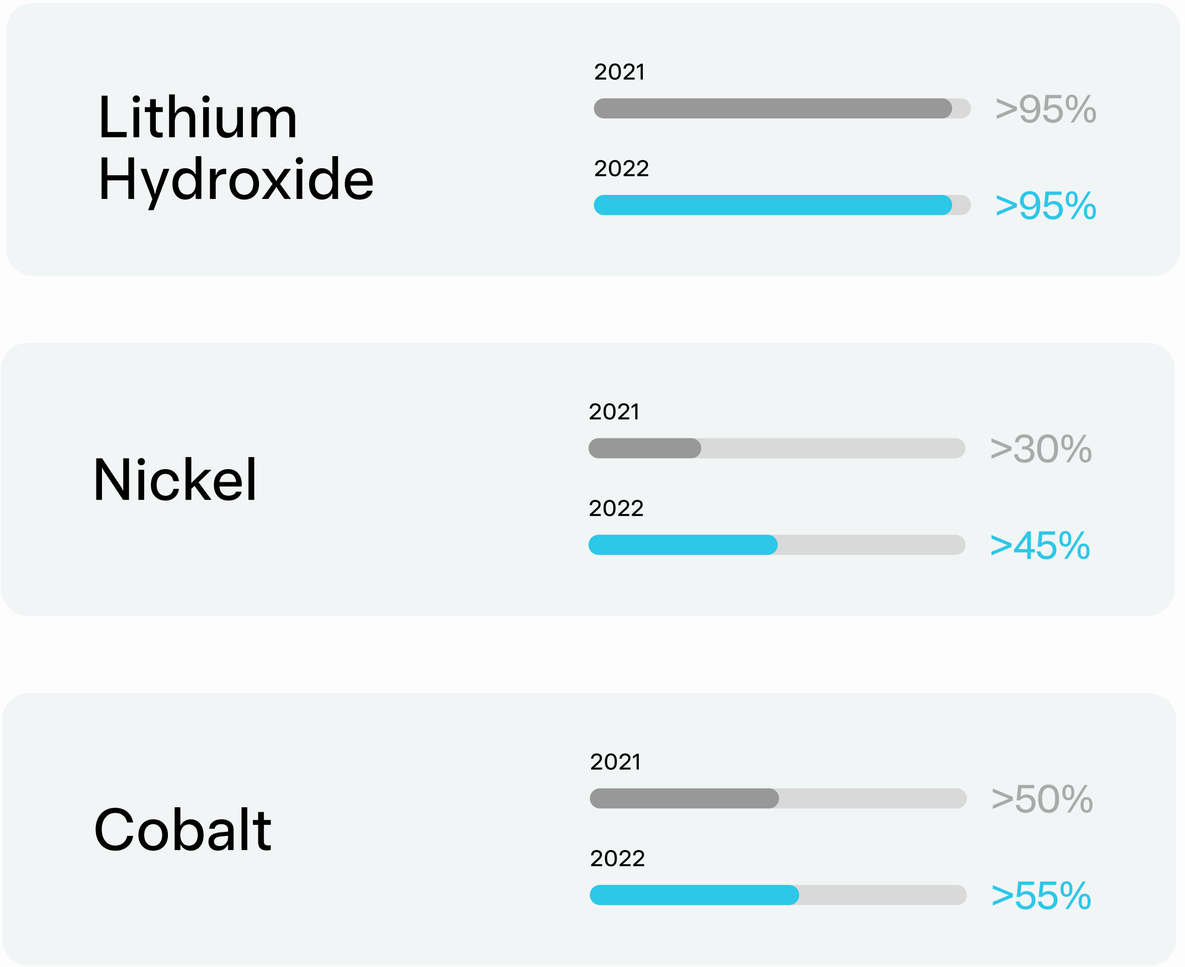
Vertical Integration and Regionalization



Direct sourcing

Direct sourcing from mining and refining companies allows us to engage in environmental and social issues in local contexts—instead of having to rely on companies that typically sit between EV manufacturers and mining. This enables more transparent and traceable supply chain data.

All contracts include binding environmental and social requirements. Nickel and cobalt saw year-over-year increases.



Independent responsible mining programs

To get an expert outside view on how mining can improve in our supply chain, we use external mining initiatives and expect suppliers to undergo independent audits.

In 2021, we joined the Initiative for Responsible Mining Assurance (IRMA) and encourage our suppliers to undergo IRMA assessments.

4 Mining companies in our supply chain completed or agreed to IRMA audits

Tesla prefers suppliers to use IRMA—the most stringent mine site standard in our view—and we also recognize other responsible production schemes.

Responsible mining and refining programs recognized by Tesla	Completed or committed to complete audits
IRMA Initiative for Responsible Mining Assurance Tesla is a member of IRMA (our preferred scheme)	**78%** of all refiners and mine sites in our cobalt, nickel and lithium supply chains
Responsible Minerals Initiative (RMI) Responsible Minerals Assurance Process (RMAP)	
Towards Sustainable Mining (TSM)	
International Council on Mining and Metals (ICMM) Performance Expectations	**100%** of all refiners and mine sites with whom we have direct contracts
CopperMark	
International Finance Corporation (IFC) Performance Standards	

More control with vertical integration and regionalization

Vertical integration and regionalization help us source battery materials responsibly and have more control over supply.

We are currently building our own lithium refinery in Corpus Christi, Texas. Our innovative lithium refining process aims to commercialize a process that eliminates the use of sulfuric acid and subsequently removes the sodium sulfate byproduct.

In 2022, we signed offtake agreements with lithium and nickel producers in the United States and Canada, growing Tesla's North American supplier base.

A better refining process

Our lithium refinery in Corpus Christi, Texas



Mapping and reducing GHG emissions in the battery supply chain

We prioritize our battery supply chain, as it makes up over 25-30% of the GHG emissions in our supply chain.

Battery supply chain = 25-30% of total supply chain GHG emissions



We identify GHG hotspots in the battery supply chain

Continuing the work from 2021, we completed a supply chain-wide GHG hotspot analysis for our nickel-based and LFP supply chains in partnership with Minviro.

These hotspot analyses are based on the specific known processing routes used in Tesla's supply chains. These are important-to-identify areas of opportunity so we can continue to push technology and optimize value chains to lower the embedded carbon of our products.

Hotspot analysis

↓

Collect primary GHG data for all hotspots

↓

Develop targeted GHG reduction efforts at hotspots



The majority of GHG emissions happen upstream from Tesla, primarily at the mineral refining stages



Within upstream supply chains, refining/chemical processing of ore/feedstock into battery product is the largest driver of impact



Lithium and cobalt are small contributors due to the low carbon footprint of Chilean brine and Congolese cobalt



Nickel is a bigger contributor in nickel-based chemistries than lithium or cobalt

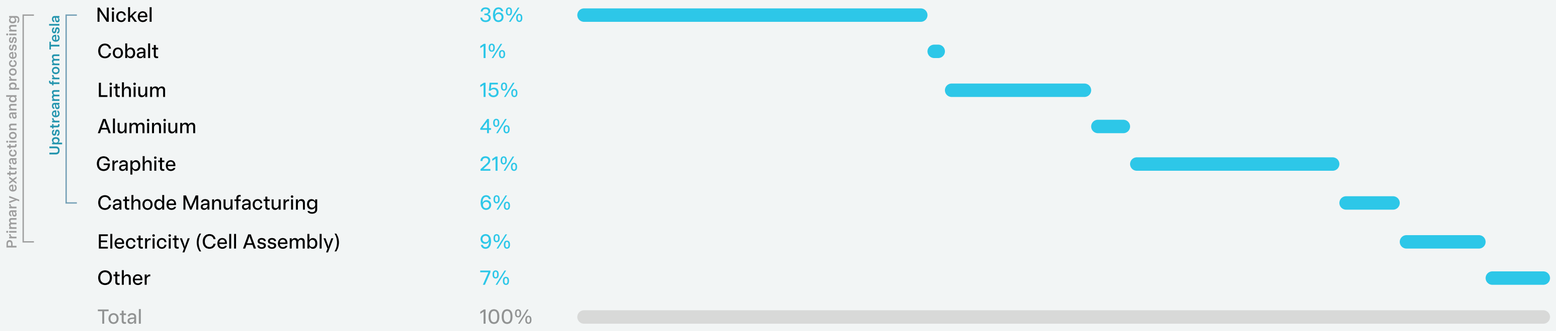


Graphite is a big contributor in both chemistries

Hotspot analyses help prioritize Tesla's GHG efforts

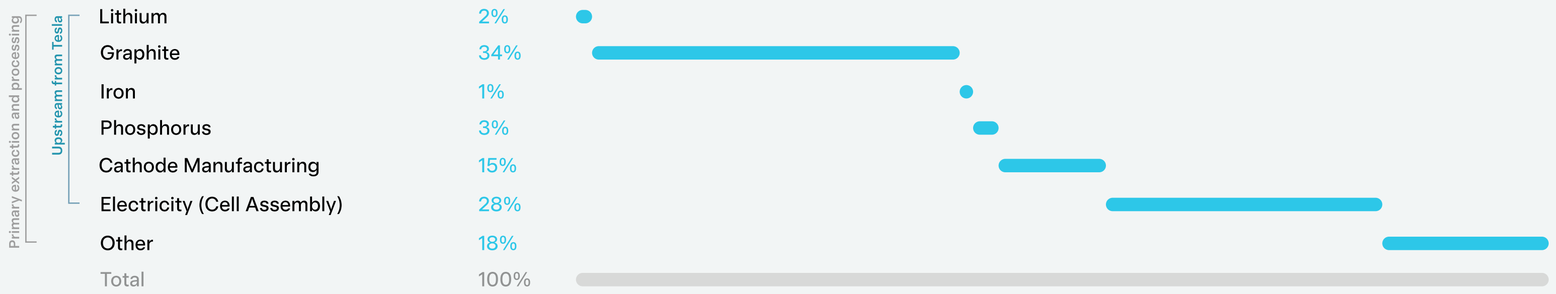
NCA Cell—Global Warming Potential Contribution Analysis

Contribution to CO_2 impact per kg



LFP Cell—Global Warming Potential Contribution Analysis

Contribution to CO_2 impact per kg



Contribution to CO_2 Impact per kg

Lithium

Chemical Processing	Primary Extraction
69%	17%
Upgrading	**Transportation**
10%	5%

Nickel

Chemical Processing	Primary Extraction
69%	18%
Upgrading	**Transportation**
10%	3%

Cobalt

Chemical Processing	Primary Extraction
77%	6%
Upgrading	**Transportation**
13%	4%

Translating data into GHG reduction measures in the battery supply chain

We develop GHG reduction efforts at mines and with refiners.

Tesla provided input to the IFC Net Zero Roadmap for Nickel and Copper Mining, which yielded recommendations for GHG emissions reductions at mining and refining sites. This includes the use of green hydrogen, process optimization (e.g., high-intensity blasting, coarse ore floating and sorting), digitization and automation (e.g., haul truck automation), unique energy storage options (e.g., compressed/liquid air) or haulage electrification.

GHG Data Coverage

76%

of cobalt, nickel and lithium mines in our supply chain

18

additional suppliers in the battery supply chain provided GHG data in response to a pilot of Tesla's GHG survey

15

Lifecycle Analyses (LCAs) shared with Tesla by suppliers



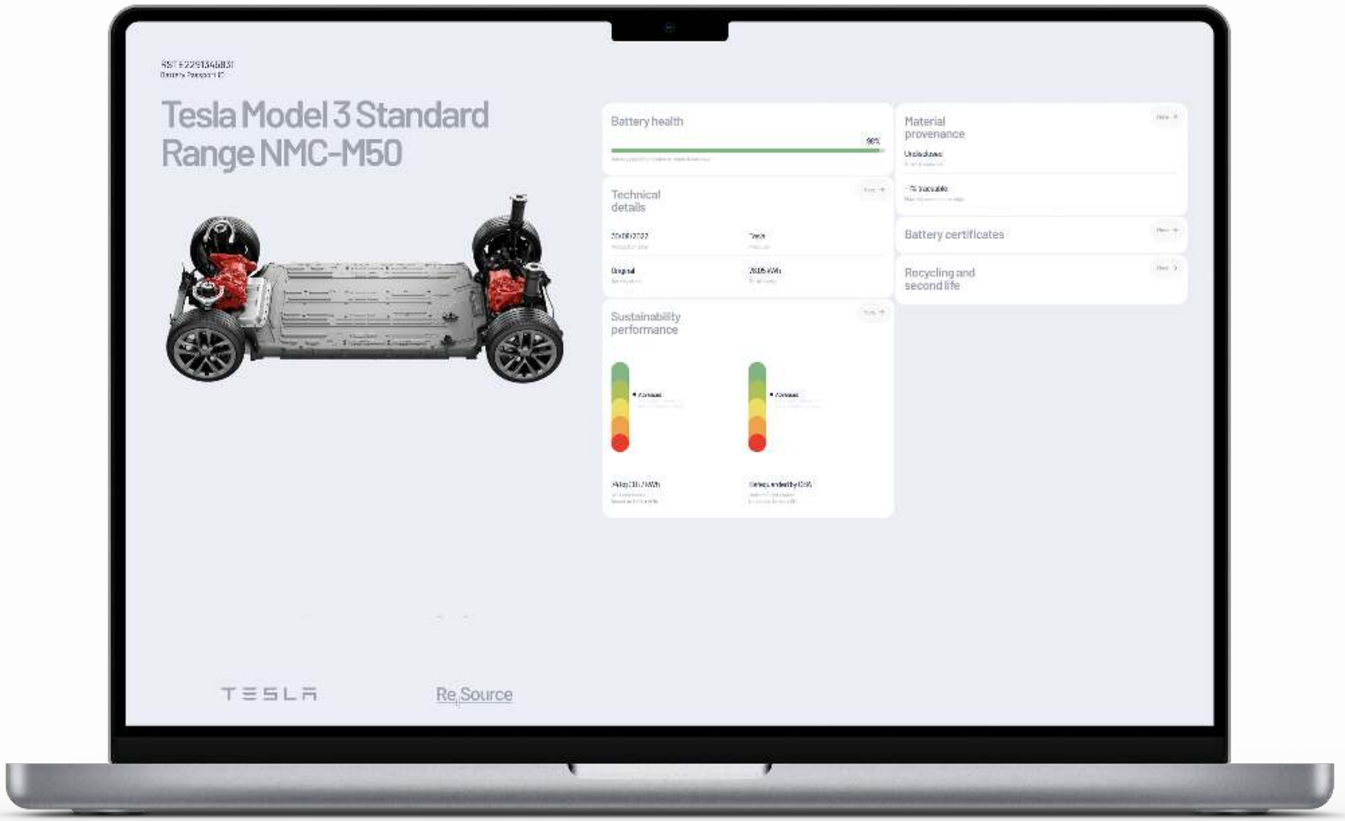
The world's first Battery Passport

As a member of Re|Source consortium and the Global Battery Alliance (GBA), in 2022, Tesla co-published the world's first Battery Passport for one of our nickel-based batteries.



Traceability technology being set up at a mine in Tesla's supply chain

We digitally traced shipments of cobalt—using blockchain-enabled barcode scanning technology—from mine to Gigafactory Shanghai and collected GHG emissions and human rights data from every stage of the supply chain.



None of our batteries go to landfills.



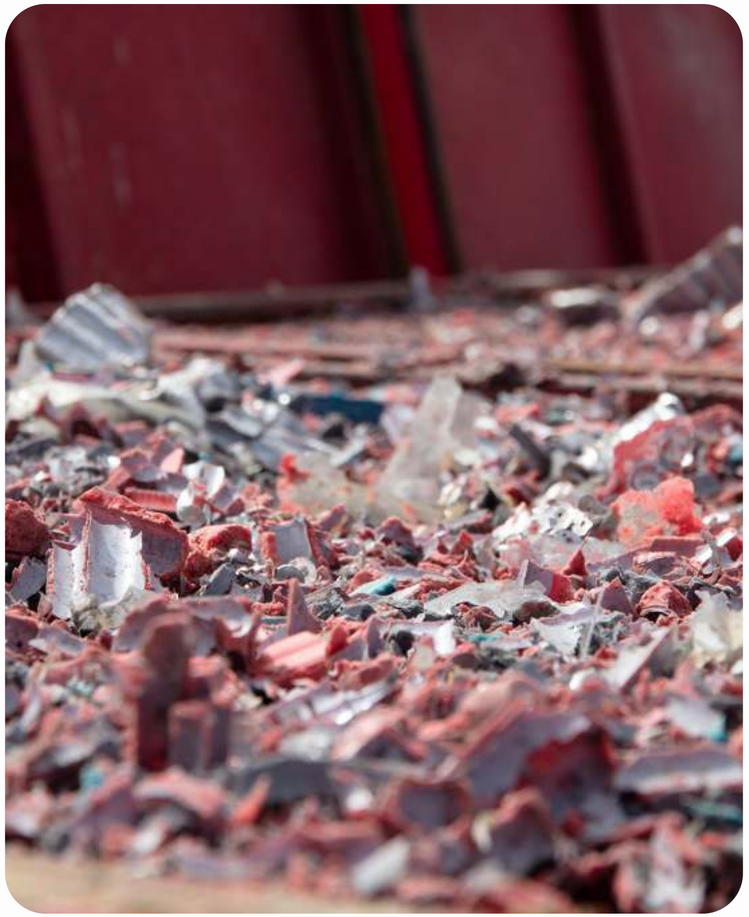
Recycling can help reduce our reliance on primary mined materials

Tesla seeks to reduce its reliance on primary mined materials and contribute to a more positive environmental footprint through battery and cell recycling. In 2022, Tesla made strong progress to advance recycling activities:

- None of our batteries (manufacturing scrap or fleet returns) go to landfills
- Deployment of equipment to recycle 100% of on-site generated manufacturing scrap across manufacturing facilities
- Safe stockpiling for future processing of any materials generated that cannot be immediately processed (thereby enabling an optimization of material streams, equipment parameters and the validation of new market technologies to recover battery metals at scale)
- Significant resources put toward the development of scalable battery recycling technology for nickel- and iron-based cathode chemistries, including recovery and re-use of lithium
- Year-over-year increase in absolute volume of materials available for recovery
- Development of a reverse logistics system to recover batteries from sold products

Tesla's recycling program aims to be the gold standard for others to follow as we optimize the safest and most efficient methods to recover materials. This will directly decrease the demand for mining in the long term.

100 metric tons/week capacity demonstrated at Gigafactory Nevada



Recovered for recycling

2021 Grand Total (mt)

1,500	200	300
Nickel	Cobalt	Copper

2022 Grand Total (mt)

2,300	300	900	300
Nickel	Cobalt	Copper	Lithium

In-house recycling process

2023

Physical Deconstruction → Thermal Processing → Qualification of Material & Sorting

2024

Physical Deconstruction → Thermal Processing → Metals Recovery

We support responsible mining and refining.



Focusing on specific materials

The best way to understand the upstream risk in supply chains is to map the supply chain. We do this by collecting information on the industries, companies and locations, wherever possible, back to the raw materials. We take a risk-based approach to these efforts, starting where there are recognized issues to address. Through this process, we identified six priority materials, listed on the right, across which our efforts are described in more detail in the following sections.

In addition to these materials, we also expanded our efforts to the apparel supply chain to give us greater visibility into provenance and labor and environmental practices.

This built on our decision in 2021 to source recycled or organically grown cotton, both of which can significantly reduce environmental impact compared to traditionally grown cotton.

The use of organic cotton also gives greater assurance to the sourcing practices and environmental impact by allowing us to select suppliers who have shared more on their due diligence efforts.

Two other areas Tesla has started to map are phlogopite mica, which we use as a thermal barrier for different applications in our vehicle and energy products, and graphite, used in the battery anode.

Phlogopite mica is relatively abundant and affordable, but it has associated risks. Tesla has mapped its mica supply chain and is working toward full traceability. Tesla also engaged with its Tier 1 suppliers and required that they become members of the Responsible Mica Initiative (RMI) and conduct regular audits.

Note: Tier 1 suppliers are those that Tesla purchases directly from. Upstream or sub-tier suppliers are those further away from Tesla, closer to raw materials.

Li
Lithium

Ni
Nickel

Co
Cobalt

Al
Aluminum

3TG
Tin, Tantalum, Tungsten & Gold

Si
Silica

5.3.1 Priority Materials

Material focus: Lithium



Risk identification in Lithium

Trip to Lithium Production Region in Chile

A Tesla team visited lithium extraction sites and met with local stakeholders in Argentina in February 2022 and Chile in February 2023.

These trips focused on questions related to water usage, indigenous peoples' rights and the use of new technologies, such as Direct Lithium Extraction (DLE), to extract lithium in a more efficient way that reduces land use, water use and energy use. The Chile trip included visits to an energy storage project.

Audits

Six audits completed, including 50% of all lithium extraction sites in our supply chain, against responsible production standards.*

GHG Mapping

GHG emissions data collected from 100% of lithium mines and upstream refiners in our supply chain.

External Stakeholder Engagement

- Engaged scientists and reviewed scientific studies related to the impact of lithium extraction on groundwater
- Discussed questions related to lithium extraction impacts on water, GHG and community engagement at a closed-door meeting of the International Lithium Association (ILiA)

Supply Chain Mapping

● Mapped ● Not Mapped

Tier	Cell	Cathode	Refining	Mining
Status	●	●	●	●

Suppliers (Tesla Contracts) & Responsible Sourcing Status

Supplier	Tier	Locations	Audit Status*	LCA Status
Albemarle	Refiner	China	N/A**	●
	Refiner	Australia	N/A**	●
	Mine	Australia	●	●
	Mine	Chile	●	●
Livent	Refiner	USA	N/A**	●
	Refiner	China	N/A**	●
	Mine	Argentina	●	●
Ganfeng	Refiner	China	N/A**	●
Yahua	Refiner	China	N/A**	●

*Against IRMA, ICMM Performance Expectations, RMI RMAP, Towards Sustainable Mining, CopperMark or IFC Performance Standards

**There is not yet a universally recognized standard for lithium refiners

● Complete ● In Progress ● Commitment ● No Commitment

Our responses to identified risks in Lithium

Priority Engagement Areas and Actions

1. Access to clean water and protecting water levels and water quality in waterways affected by supplier operations
   - Evaluated third-party studies on water impacts related to lithium brine extraction
   - Worked with suppliers on solutions that increase water recycling, rely on saltwater desalinization for operations and educate consumers on the differences between brine and water

2. Protection of forests and biodiversity
   - Reviewed environmental permit documentation and site visits to confirm ecosystem protection measures are in place
   - Two of our lithium suppliers underwent audits against IRMA, which includes strict biodiversity and protected areas requirements

3. Community consultation, engagement and protection of indigenous rights
   - Tesla site visits included direct community engagement to confirm suppliers' investments on the ground and active community consultation
   - Offtake contracts include commitments to the important role of native communities as traditional owners of the land

4. Energy use and GHG emissions reduction and air pollution
   - Worked with our suppliers to reduce dependence on non-renewable resources
   - Explored ways to reduce carbon footprint (such as through Direct Lithium Extraction)
   - Two of our cell manufacturing suppliers committed to the Science-Based Targets Initiative (SBTi)

>95% sourced lithium hydroxide directly from upstream suppliers in 2022

Exploring future projects at the source of our lithium and nickel supply chains

Similar to our efforts in cobalt, Tesla will explore financing sustainability projects in countries at the source of our lithium and nickel supply chains to support the identified engagement areas. We developed a framework that allows us to identify projects aligned with our mission based on technical feasibility, financial stability, participatory planning process, localized procurement, robust monitoring and evaluation, innovation, collaboration with other stakeholders among others.



Tesla delegation visit to Chile in February 2023

Material focus: Nickel



Risk identification in Nickel

Tesla Trips To Canada And Indonesia

A Tesla team visited nickel mine sites and met with local stakeholders in Indonesia in May 2022 and in Canada in August 2022. The Indonesia trip focused on questions related to deforestation, water management and local traceability efforts.



Tesla staff at a nickel mine in Canada, August 2022

Audits

Twenty-eight audits completed, including 62% of all nickel refiners and mines in our supply chain, against responsible production standards.*

GHG Mapping

GHG emissions data collected from 61% of nickel mines and upstream refiners in our supply chain.

External Stakeholder Engagement

- Ongoing discussions with NGOs related to appropriate mining standards for nickel mining, stakeholder mapping and community impacts in Indonesia
- Participated in and provided input to the IFC Net Zero Roadmap for Copper and Nickel Mining that was published in February 2022
- Reviewed Nickel Institute industry-wide Lifecycle Analysis (LCA)
- Discussed our sustainability expectations during a roundtable on ESG expectations for nickel producers in Indonesia organized by the Nickel Institute in December 2022

Supply Chain Mapping

● Mapped ● Not Mapped

Tier	Cell	Cathode	Refining	Mining
Status	●	●	●	●

Suppliers (Tesla Contracts) & Responsible Sourcing Status

Supplier	Tier	Locations	Audit Status*	LCA Status
Huayou	Refiner	China Indonesia	● ●	● ●
CNGR	Refiner	China Indonesia	● ●	● ●
Glencore Murrin Murrin	Mine	Australia	●	●
BHP Nickel West	Mine	Australia	●	●
Prony Resources	Mine	New Caledonia	●	●
Vale Sudbury	Mine + Refiner	Canada	●	●

*Against IRMA, ICMM Performance Expectations, RMI RMAP, Towards Sustainable Mining, CopperMark or IFC Performance Standards

● Complete ● In Progress ● Commitment ● No Commitment

Our responses to identified risks in Nickel

Priority Engagement Areas and Actions

1 **Fair working conditions, human rights and occupational health and safety**

Reviewed safety records and provided clear guidance on safeguards around working conditions

2 **Access to clean water and protecting water levels and water quality in waterways affected by supplier operations**

Included clear expectations on water management and reviewed reports on water quality around mine sites

3 **Protection of forests and biodiversity**

Reviewed environmental permits and annual reports provided to government to ensure mining is occurring within permitted areas

4 **Community consultation, engagement and protection of indigenous rights**

Worked with suppliers to conduct thorough stakeholder mapping and maintain relationships with local communities

5 **Energy use and GHG emissions reduction and air pollution**

- Encouraged suppliers to transition to renewable energy sources and follow up on commitments to install solar energy capacity
- Reviewed industry roadmaps and work plans to decarbonize the nickel mining sector
- Included GHG emissions reduction initiatives in our yearly surveys to direct suppliers

6 **Hazardous substance management**

Reviewed audit results and corrective action plans to ensure suppliers meet expectations around hazardous waste

8 **Waste management, including tailings**

Engaged with suppliers to ensure adequate tailings management systems are in place so that a prompt response is deployed in case of failure

9 **29 suppliers removed**

Due to supply chain due diligence concerns after attempted risk mitigation

>45% sourced Nickel directly from producers in 2022

Material focus: Cobalt



Risk identification in Cobalt

Trip to Cobalt Production Region in DCR

A Tesla team visited industrial and artisanal mine sites and met with local stakeholders and NGOs working on issues like health, safety and child labor remediation in the Democratic Republic of Congo (DRC) in November 2022.

The trip focused on community engagement and artisanal-industrial mining relations, as well as environmental conditions and occupational health and safety at industrial cobalt mines.

Audits

Sixteen audits completed, including 88% of all cobalt refiners and mines in our supply chain, against responsible production standards.*

GHG Mapping

GHG emissions data collected from 89% of cobalt mines and upstream refiners in Tesla's supply chain and every step from the KCC mine site in the DRC to Giga Shanghai via the Battery Passport pilot mentioned on page 160.

External Stakeholder Engagement

Reviewed grievances from NGOs and academic studies related to working conditions at industrial mines.

Supply Chain Mapping

● Mapped ● Not Mapped

Tier	Cell	Cathode	Refining	Mining
Status	●	●	●	●

Suppliers (Tesla Contracts) & Responsible Sourcing Status

Supplier	Tier	Locations	Audit Status*	LCA Status
Huayou	Refiner	China	●	●
CNGR	Refiner	China	●	●
Glencore KCC	Mine	DR Congo	●	●
Glencore Mutanda	Mine	DR Congo	●	●

*Against IRMA, ICMM Performance Expectations, RMI RMAP, Towards Sustainable Mining, CopperMark or IFC Performance Standards

● Complete ● In Progress ● Commitment ● No Commitment

Our responses to identified risks in Cobalt

Priority Engagement Areas and Actions

1 Fair working conditions, human rights and occupational health and safety

- Requested assessments of safety standards
- Explicitly included human rights allegations, community complaints or grievances in the management system for security incidents
- Suppliers assigned specific staff accountable for human rights

2 Co-existence between industrial and artisanal mining operations, incl. land use

Active stakeholder engagement activities with ASM stakeholders and collaboration with government and development agencies to support artisanal and small-scale mining (ASM) operators in the improvement of their environmental and social practices

3 Good corporate governance

Suppliers developed new compliance programs, including improved reporting of material compliance issues and compliance trainings and awareness raising, and updated Anti-Corruption and Bribery Policies

4 Safe substance management

- Second-party audit to assess risk of loss of containment
- Monitor status of water management plan development and communications on water issues to stakeholders

5 12 suppliers removed

Due to supply chain due diligence concerns after attempted risk mitigation

>55% sourced Cobalt directly from producers in 2022



Tesla visit to a Cobalt production site in the DRC in November 2022

Tesla supports efforts to improve conditions in the DRC

Tesla has a robust due diligence program in place to ensure we do not buy artisanal cobalt. We also understand that artisanal and small-scale mining (ASM) can sometimes be an important economic opportunity for members of local communities. Rather than disengaging, we support our suppliers and local stakeholders in addressing some of the challenges that affect their livelihoods.

Through our founding membership in the Fair Cobalt Alliance (FCA), we are focused on providing resources to adults that will improve their safety while at work and providing educational and employment opportunities to minors as an alternative to engaging in dangerous mining activities.

Fair Cobalt Alliance
L'Alliance du Cobalt Equitable

The FCA reported on its 2022 progress here.
Photo by the Fair Cobalt Alliance.

The FCA is a multi-stakeholder initiative that:

- Supports formalization, living wages and dignified working conditions on cobalt (ASM) sites in the DRC
- Provides protective equipment as well as organizes health and safety trainings
- Supports schools, orphanages and medical centers to keep children out of mines



5.3.4 Priority Materials

Material focus: Aluminum



Risk identification in Aluminum

Internal Efforts

In 2022, we placed importance on mapping our aluminum supply chain to better understand the upstream supply chain and various processing stages before the material reaches Tesla. Our responsible sourcing team has worked closely with the relevant supplier managers to discuss potential risks and the best steps to address them.

Tesla supports the use of recycled aluminum in our products through our in-house alloy development, which allows for recycled inputs to be utilized in high-performance applications; however, it's important to recognize that because of total rising global demand for aluminum, merely shifting to recycled inputs is not enough to affect the magnitude of change needed to reach a truly sustainable aluminum sector.

External Stakeholder Engagement

We continued discussions with the Aluminum Stewardship Initiative for the certification of our suppliers as well as for our own operations. We consulted with external industry experts to further evaluate the inputs of aluminum supply chains to inform our risk assessment and mitigation efforts.

Furthermore, we supported the efforts of the RMI (formerly Rocky Mountain Institute) Horizon Zero Aluminum Working Group to create a better framework for calculating emissions from the aluminum industry and moving it toward a low-carbon future.



Our responses to identified risks in Aluminum

Priority Engagement Areas and Actions

1 Fair working conditions, human rights and occupational health and safety

In 2022, we expanded our engagement efforts with direct suppliers to understand their existing policies on the topics of fair working conditions, human rights and occupational health and safety and, where helpful, required third-party audits to assess gaps and drive corrective actions. We began building a more robust understanding of the companies and locations upstream in our supply chain, to understand their practices and enhance our due diligence of relevant risks.

2 Energy use and GHG emissions reduction and air pollution

We plan to ask 100% of our Tier 1 aluminum suppliers to certify to the Aluminum Stewardship Initiative's (ASI) Performance Standard, requiring the development of management systems to track GHG emissions and publicly disclose them. A majority of those asked have already begun the certification process.

ASI's performance standard also includes criteria related to business integrity, policy and management, transparency, material stewardship, GHG emissions, effluents and wastes, water, biodiversity, human rights, labor rights and occupational health and safety.



5.3.5 Priority Materials

Material focus: Tin, Tantalum, Tungsten and Gold



Risk identification in Tin, Tantalum, Tungsten and Gold (3TG)

Trip to 3TG Production Regions in East Africa

In 2022, representatives from Tesla's Responsible Sourcing team traveled to Rwanda and Uganda to learn more about with Tesla's 3TG supply chain. Our purpose was to observe on-the-ground conditions, assess audit schemes, meet with capacity-building groups and local stakeholders (including representatives from artisanal and small-scale mining (ASM) organizations, mid-stream supply chain actors and civil society) as well as explore opportunities for impact.

We became more closely involved with understanding the due diligence efforts of existing, globally recognized assurance programs and sought to identify opportunities for improvement to best allow Tesla to gain visibility and actionable information about on-the-ground impact.

Where we found potential problems, we voiced our concerns and worked with local stakeholders to support improvements. Where we saw programs that offered more opportunity for transparency and positive impact, we have engaged on our potential involvement.

External Stakeholder Engagement

In 2022, a member of Tesla's Responsible Sourcing team became a co-chair of the Responsible Minerals Initiative Gold Team, a workgroup aiming to increase the uptake of responsible sourcing practices in the gold supply chain. We met with representatives from RMI, peer companies in the automotive and technology sectors and civil society stakeholders to discuss opportunities to continually improve the industry's approach to responsible 3TG sourcing.

We provided feedback to RMI and other OECD-aligned, independent assessment programs (such as London Bullion Market Association's [LBMA] Responsible Gold Programme) on opportunities to strengthen the industry's audit protocol, upstream due diligence and collective industry tools.

4 3TG mines and refiners visited by Tesla

Our responses to identified risks in 3TG

Priority Engagement Areas and Actions

1 **Fair working conditions, human rights and occupational health and safety**

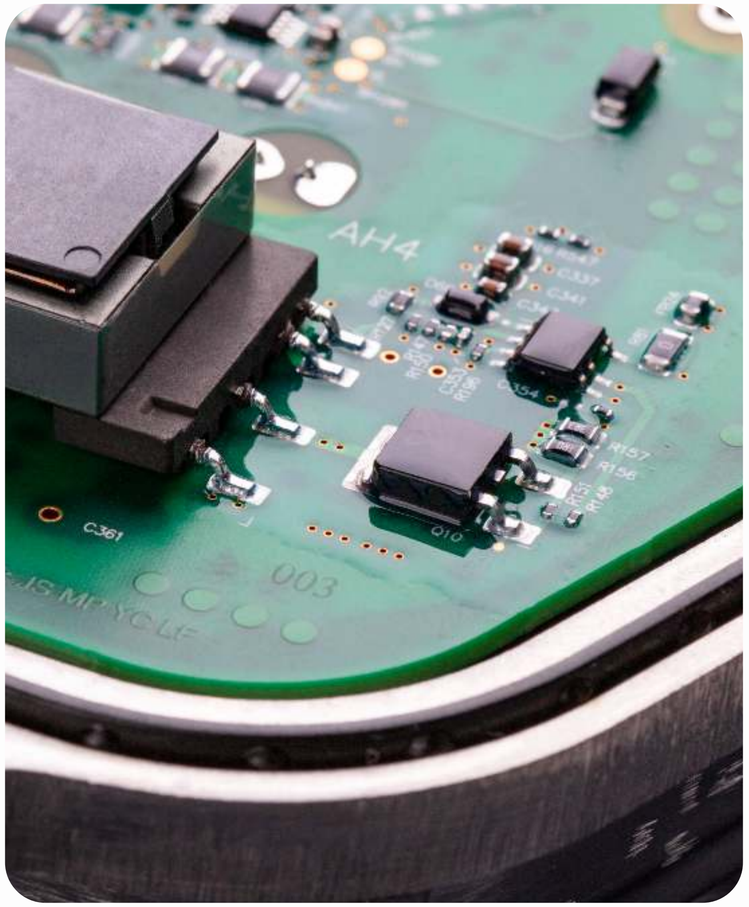
Tesla's East Africa delegation included discussions with civil society organizations to evaluate opportunities for Tesla to become more involved with efforts to improve conditions in the 3TG upstream supply chain.

2 **Violence and conflict**

We conduct due diligence in line with the OECD Due Diligence Guidance for Responsible Minerals Supply Chains, including surveying our supply chain to understand the 3TG smelters and refiners in Tesla's supply chain.

We continue to require our direct suppliers to source only from smelters and refiners (SoR) that are certified to a globally recognized due diligence framework. Where a supplier provides us with information that one or more SoR in our supply chain is not certified, we request information on their current actions and timelines to remove that SoR. We continue to explore opportunities to strengthen our approach to responsible sourcing of 3TG.

For more information, view our Conflict Minerals Report.



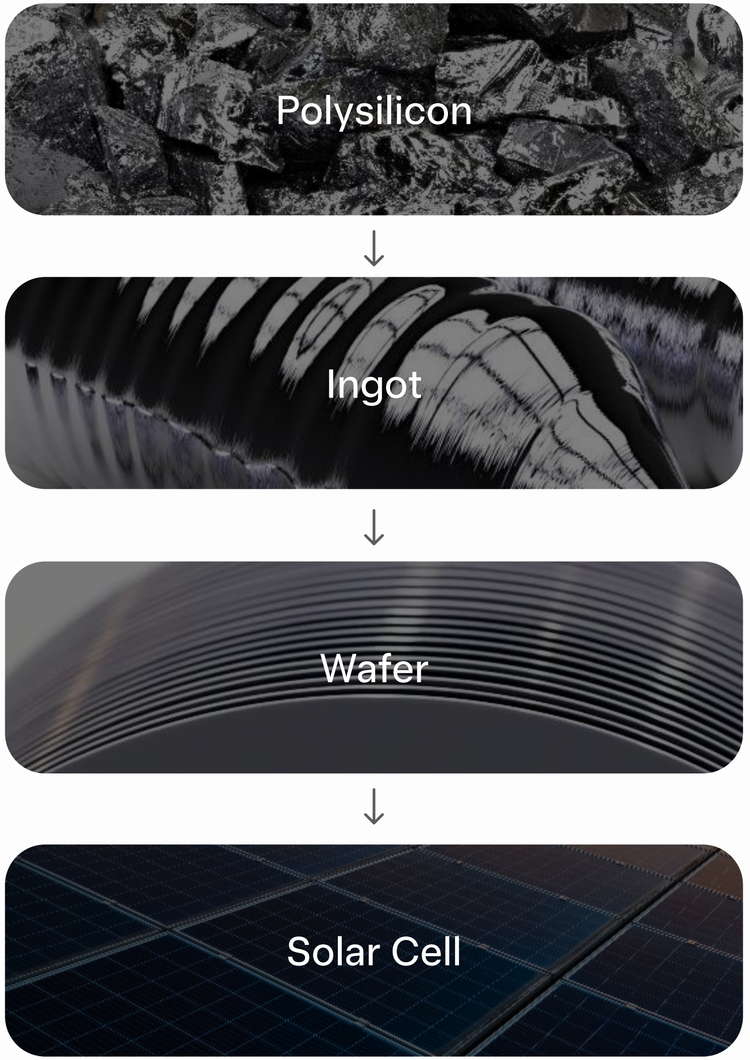
Material focus: Silica



Risk identification in Silica

Supply Chain Mapping

In 2022, we conducted a full supply chain mapping for our Solar Roof offerings and gained visibility into upstream suppliers back to the polysilicon level. This has allowed us to assess and mitigate any potential risks.





Our responses to identified risks in Silica

Priority Engagement Areas and Actions

1 Proactive supplier assessment and selection

Tesla established a method to screen potential suppliers and began conducting proactive supplier due diligence, starting with the initial sourcing process through to business award. For the solar cells going into our Solar Roof product, we collaborated with a candidate supplier to verify suppliers back to the polysilicon level. For each tier, we verified the origin of materials prior to sourcing. Through this process, we were able to successfully influence sub-tier supplier selection.

2 Industry collaboration

We participated in a Responsible Labor Initiative (an initiative of the Responsible Business Alliance) working group on forced labor to better understand how we can enhance our efforts and contribute to others' understanding of best practices. This has allowed us to stay up-to-date with industry trends and best practices, as well as support shared solutions.

3 Fair working conditions, human rights and occupational health and safety

In our other solar supply chains, our suppliers take the lead in mapping and selecting their sub-tier suppliers. This leads to a lower level of control or ability to influence for Tesla in some cases. In those areas, we still strive to gain visibility into our sub-tier supply chain and gather information to increase our confidence in proper working conditions and respect for human rights.

In cases where suppliers have been unable or unwilling to meet our expectations, we navigated away from them and chose alternative sources. While this approach led to a more limited supply base, it has provided us with an increased confidence level in the companies with whom we chose to do business.

5.4 Data Systems

We focus on data-driven due diligence.



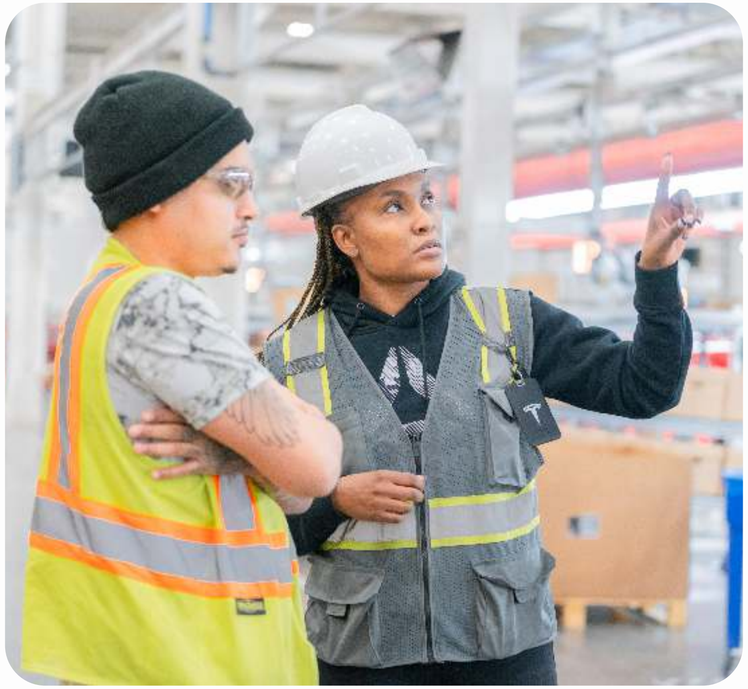
Audits

Corporate Social Responsibility Audits

2022 marked the fifth year of our social and environmental compliance audits, which follow the Responsible Business Alliance's audit guidance. We greatly expanded the scope of our audits in both the number and geographic location of suppliers who underwent these audits.

We continue to leverage third-party audit firms to ensure standardization and consistency in our supplier assessment methodology as well as the independence of the results. To emphasize the importance of these audits and respective results, and to ensure Tesla's high standards are met, we expanded our audit team to attend nearly 50% of our conducted supplier audits in person in 2022.

We prefer announced, planned audits as a best practice to engage collaboratively with our suppliers; however, when necessary due to elevated risk or potential allegations, we hold the right to deploy unannounced, focused audits to spot-check specific risks or management systems.



Assessment Category	Assessment Items
Inherent Risks associated with a facility's characteristics	Location Industry
Exposure How impactful a supplier is to our production	Spend Single/Multiple Source
Direct Suppliers' CSR performance • Self-Assessment Questionnaire (SAQ) • Previous CSR audit results • NGO or other CSR related reports • Internal nomination	SAQ Previous Audit NGO/News reports

Continuous improvement

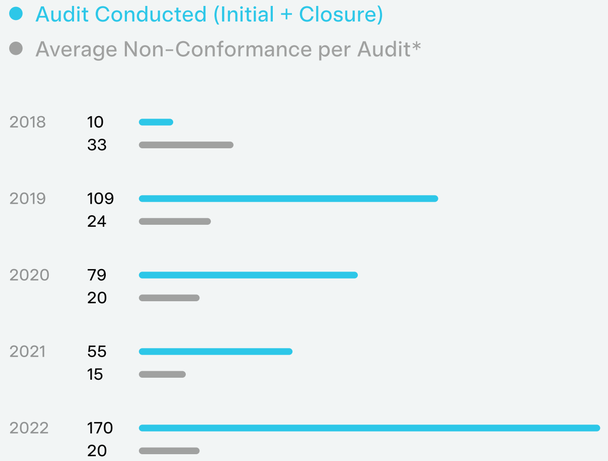
We use audits as a tool for driving continuous improvement with our suppliers by:

- Ensuring that corrective actions are implemented for identified issues
- Requiring closure audits where a priority non-conformance is identified
- Enforcing suppliers' work toward respective improvements
- Ensuring improved working conditions for those on site

Working with suppliers where issues are found rather than walking away

We found that many of our suppliers had never been audited at their facilities by their other customers. As a result, our audit program enables capacity building to improve their overall operations. Using a globally recognized standard offered an opportunity to understand best practices based on industry expectations. As these suppliers become familiar with management systems for social and environmental issues, we expect their performance to improve with a renewed commitment.

Supplier Audit Findings (2018-2022)



Breakdown of Findings by Topics (%)*

	Labor	Health & Safety	Environment	Ethics	Management Systems
2018	27.7	29.2	14.2	5.7	23.2
2019	30.5	29.1	13.3	3.8	23.5
2020	30.2	35.5	14.6	0.6	19.0
2021	37.6	31.3	13.0	0.5	17.5
2022	33.0	31.5	14.2	1.8	19.5

*Excluding closure audits

Utilizing primary and secondary data sources

Primary Data Source: Supplier Self-Assessment Questionnaire (SAQ)

In 2022, Tesla launched a Supplier Self-Assessment Questionnaire to enable data-driven due diligence. The SAQ is a scalable, ongoing approach to monitoring supply chain social and environmental risks based on practices at supplier manufacturing facilities. Suppliers are asked to affirm that they have policies, processes and controls at the manufacturing site level consistent with all Code of Conduct topic areas: labor, health and safety, environment, ethics and supply chain responsibility. Responses to the survey are reviewed, escalated and prioritized for on-site audits where required. For the initial pilot launch, Global Supply Management teams selected 52 suppliers to participate across 18 different spend categories such as chemicals, glass, seating, stampings and lighting. This approach ensured representation and engagement across most major sourcing scopes, resulting in an overall 70% response rate.

Secondary Data Sources: External Databases & News

We continue to engage third-party service providers to monitor our supply chain for emerging events that may affect supplier manufacturing locations, directly or indirectly. These events include, but are not limited to, labor relations, human rights and environmental degradation. Monitoring allows Global Supply Managers to be notified as soon as information about suppliers becomes public and engage directly with the supplier to understand their plans to address identified risks.



Our grievance and remedy process

Tesla is committed to providing avenues for rights holders and rights defenders to raise potential concerns. We place importance on the provision of effective remedies if a human rights impact were to occur. In such instances, Tesla aims to implement updates to systems, due diligence processes and practices to prevent similar adverse impacts in the future.

The Integrity Line is one of Tesla's grievance mechanisms that can be used by suppliers to report concerns anonymously, especially those relating to Tesla's policies against illegal conduct, unethical behavior or human rights violations including child or forced labor. In 2022, Tesla received several inquiries on its efforts to combat forced labor in the supply chain.

When a concern is raised, Tesla works to address and resolve the case, working with stakeholders to address or improve conditions raised. We expect our suppliers and their respective suppliers to implement an effective grievance management system for their operations—reaching suppliers' workers and their legitimate representatives.

Suppliers must prohibit retaliation against individuals who raise concerns. Through third-party assessments, we assess whether grievance mechanisms and channels for workers to raise concerns are adequate, effective and accessible. Tesla encourages its suppliers to consult potential or actual users on the design, implementation or performance of their mechanism(s).

To ensure effective grievance channels are maintained in our supply chain, we have adopted a four-point cross checking approach in Tesla's Corporate Social Responsibility Audits, which includes site observation, records review and interviews with workers and management.

See examples of our actions on this topic on page 214.

Tesla seeks to leverage and encourage responsible parties to assess conditions and implement corrective actions, even in circumstances where Tesla is not directly linked to an identified adverse impact.

We take action to influence any adverse impacts that could be linked to us and engage with peers and partners on collective remedies, including collaboration with suppliers.

In instances where stakeholders prefer mechanisms outside of those operated by Tesla, other external grievance mechanisms are available, such as the Responsible Business Alliance's Grievance Mechanism, the Responsible Minerals Initiative's Minerals Grievance Platform and the non-judicial grievance mechanism operated by the Organization for Economic Cooperation and Development.



Integrity Line available 24/7 in 60 languages

Supplier diversity

Tesla's Supplier Diversity Program is a proactive initiative contributing to socio-economic benefits where Tesla operates. We connect minority-owned businesses (women, LGBTQ+, disabled, veteran, etc.) with at least 51% ownership with procurement opportunities.

In 2022, we identified hundreds of Tier 1 diverse suppliers within our production, construction and other services procured. Our spend with these suppliers reached approximately $800 million since 2021. Year-over-year spend with diverse suppliers increased by 67% between 2021 and 2022. We plan to continue expanding our sourcing from a diverse supplier base.

Construction Materials and Services

We established a Giga Texas Historically Underutilized Business (HUB) program in 2020 as part of our Economic Agreement with Travis County. This program focuses on identifying diverse 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.

~$800M spend with diverse Tier 1 suppliers



06

Governance

SUSTAINABILITY IS CENTRAL
TO OUR MISSION AND SUPPORTED
BY OUR GOVERNANCE

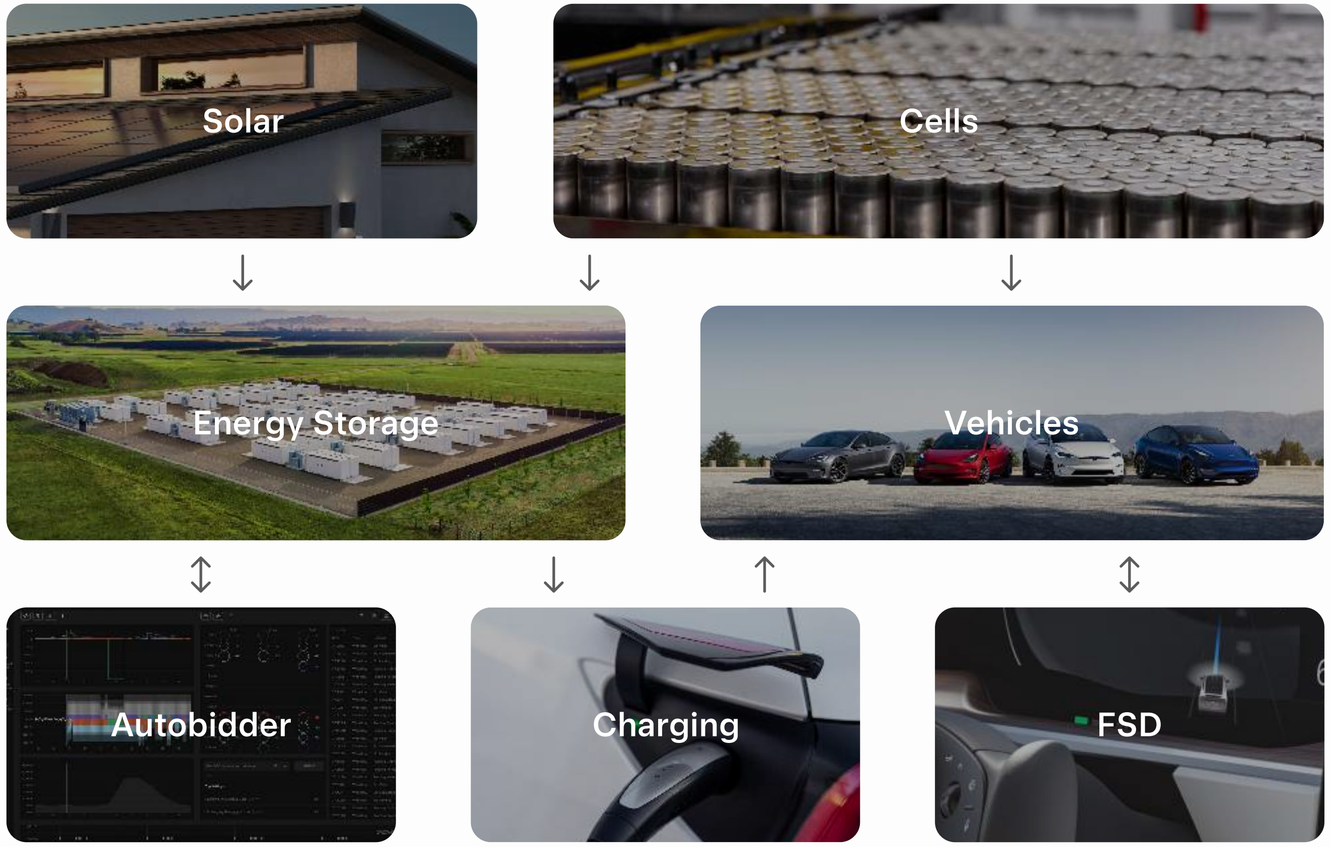


Our mission is to accelerate the world's transition to sustainable energy

Since its inception, Tesla's business model has centered on the opportunities presented by the sustainable energy transition. We have developed a clean energy ecosystem that addresses the energy generation and storage and transportation sectors.

Through our electric vehicles and zero-emission energy products, we are accelerating the world's transition to sustainable energy.

In 2022, our customers avoided emitting 13.4 MmT of CO_2e



Governance
Overview

Management involvement

At Tesla, sustainability is everyone's job. Our Sustainability Council, made up of leaders from across Tesla, ensures the collection of data, analysis preparation and content of this report.

The Sustainability Council presents any material issues and themes related to sustainability to Tesla's Board of Directors (BoD).

For information on Tesla's corporate governance more broadly, please see our 2023 Proxy Statement.

Board of Directors overview

The Board of Directors serves as a prudent fiduciary for shareholders and oversees Tesla's mission, purpose and strategy, and 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 Board 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 ESG-related disclosures in our Securities and Exchange Commission filings.

Our Compensation Committee oversees human capital management, employee engagement and diversity and our compensation philosophy and programs designed to align compensation to the performance of our company and success of our mission to accelerate the transition to sustainable energy. Our Nominations and Corporate Governance Committee oversees our governance framework, board composition and diversity and engagement on ESG issues with shareholders.

Our Board 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 Board, such as Larry Ellison and Kathleen Wilson-Thompson in 2018, Hiromichi Mizuno in 2020, and director-nominee JB Straubel in 2023.

TCFD Alignment

In 2022, we began aligning this report with Task Force on Climate-Related Financial Disclosures (TCFD)

While the main 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.

With that in mind, in 2022, we developed a dedicated governance strategy that will allow Tesla to assess, manage and act on its own climate-related risks. The strategy is based on recommendations from the TCFD.



Managing climate risk

The Sustainability Council is comprised of executives from across Tesla who meet to make decisions affecting the business with consideration of 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 Team at Tesla reports directly to the VP of EHS&S and meets quarterly with the Sustainability Council working group to present megatrends and climate change updates. This working group, through the VP of EHS&S, reports events directly to the BoD.

Tesla conducts an annual Enterprise Risk Assessment (ERA) to identify risks posed to the organization, including ESG-related risks. Interviews and surveys are conducted 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 the 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, such as our recently announced gigafactory in Mexico. These risks were delivered to the relevant site leaders and will be important 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-term 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 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.

In 2022, Tesla completed climate risk assessments for our manufacturing portfolio



Physical climate risk assessment

In partnership with Cervest, using their Earthscan software, Tesla performs physical climate risk assessments for our manufacturing and support locations, including for any new manufacturing sites.

In 2022, 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 remains the biggest risk for our manufacturing portfolio, and in the long term, heat stress will become the more severe climate hazard.



Human rights

Human rights are core to our mission

The ethical treatment of all people and regard for human rights is core to our mission of 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 as we accelerate the world's transition to sustainable energy.

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 Nations Guiding Principles on Business and Human Rights and the Organization for Economic Cooperation and Development Guidelines for Multinational Enterprises.

We are committed to upholding and respecting all internationally recognized human rights and the values they represent 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.

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

Assessing and addressing human rights risks is an ongoing effort that involves engaging with and incorporating input from external stakeholders of potential impact, including stakeholders impacted by our operations and our supply chain, as well as reviewing and updating our policies and procedures where necessary. With this understanding, Tesla is committed to addressing any potentially adverse human rights impacts. We seek to remedy adverse impacts, track and measure our progress and report our findings.



You can see our full Global Human Rights Policy here.

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.

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 legal, engineering and product organizations who are dedicated to protecting customer data.

Additionally, the Audit Committee of the Tesla Board of Directors 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 of our products and services, from inception to rollout 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

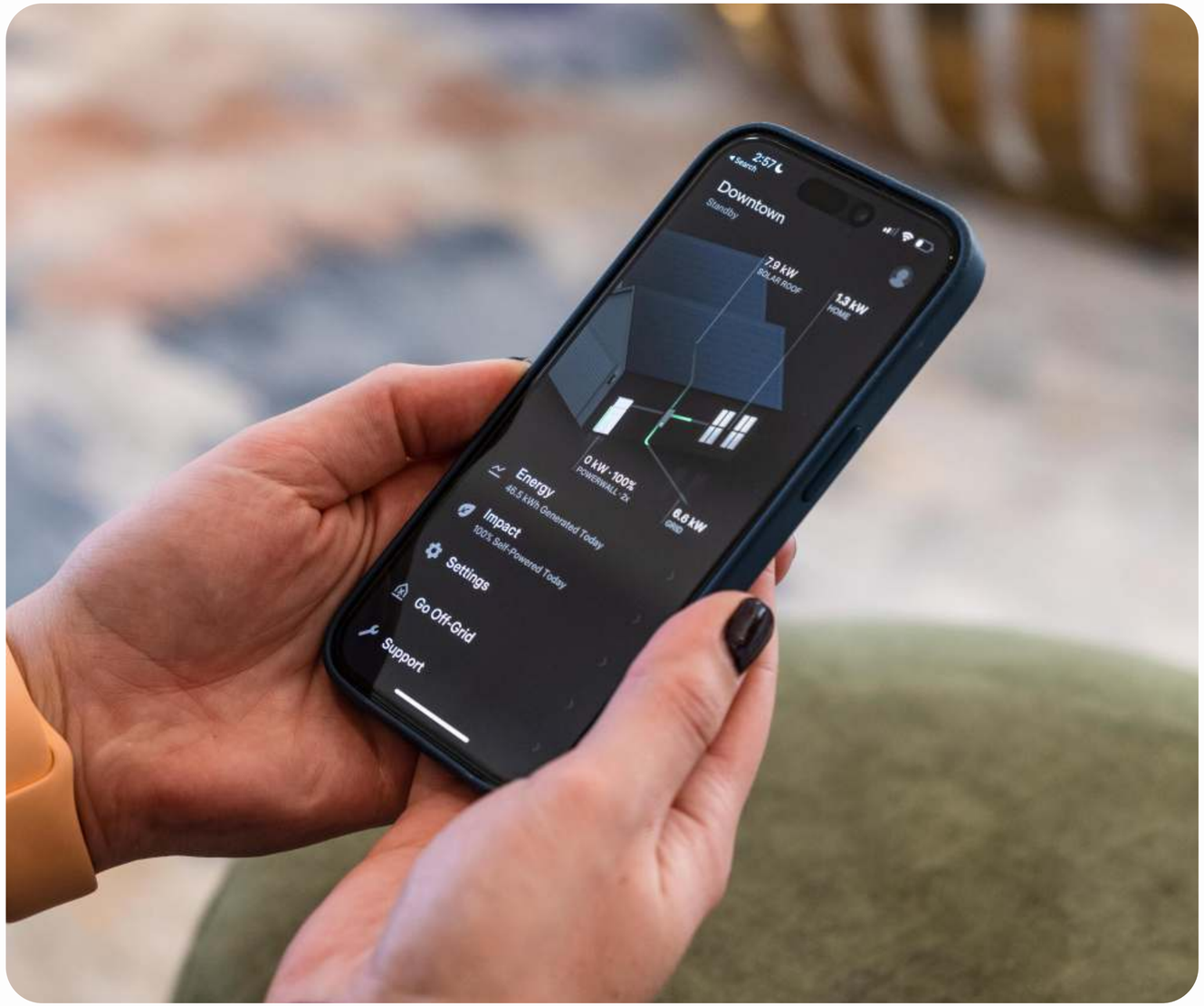
We implement rigorous controls and standards designed to protect the security, confidentiality and integrity of Tesla's data environment

Privacy from day one

Tesla's Privacy Principles and commitments are illustrated throughout all our products. For Tesla vehicles, customer personal data is protected from the moment they take delivery, ensuring that by default the vehicle data generated when driving is not associated with the customer's 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, from Powerwall to Solar Roof, 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 data at any time right from the Tesla app.



Engaging the security community

We are also focused on ensuring that our vehicles are the most secure on the road.

To do that, our team of world-class engineers work day in and day out to ensure that our systems 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 cannot work alone.

We work closely with the security research community to benefit from their collective expertise and diversity of thought.



07

Appendix

SUPPORTING MATERIALS

How we calculate emissions savings

The 11.8 million metric tons of vehicle CO_2e emissions savings estimate is based on the net CO_2e emissions savings during the use-phase of a Tesla vehicle compared to an ICE vehicle with a real-world fuel economy of ~24 mpg (of which 1.1 million metric tons is avoided through annual renewables matching for the global Supercharger network and home charging in California).

The 1.6 million metric tons of solar + storage CO_2e emissions savings estimate is based on CO_2e emissions avoided through generation of zero-emission electricity from Tesla solar panels, including energy stored and later dispatched from our energy storage products.

Geographic distribution of our deliveries (both vehicle and solar), grid mix at the country, state and province level and upstream emissions are reflected in these figures.



TCFD Alignment Table

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 page 194 and 196 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 197 of this report. Opportunities: Please see "Our Mission" on page 193 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 193 of this report. **Transition Risk:** Please see "Governance: Managing Climate Risk" on page 196 of this report for climate-related procurement risks. Please see "Governance: Managing Climate Risk" on page 196 of this report for other climate-related transition risks. **Physical Risk:** Please see "TCFD: Physical Climate Risk Assessment" on page 197 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 193 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 197 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 165-175.
Risk Management	Describe the organization's processes for identifying and assessing climate-related risks.	Please see "Governance: Overview" and "Managing Climate Risk" on page 194 and 196 of this report, and "TCFD: Physical Climate Risk Assessment" on page 197 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 142 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 194 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 42 and "TCFD: Physical Climate Risk Assessment" on page 197 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 page 207 of this report.
	Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	Tesla management and BoD are exploring which frameworks and methodologies may be appropriate to use for developing climate- and emissions-related targets. Please see our emissions-related targets on page 42 and "TCFD: Physical Climate Risk Assessment" on page 197.

SASB Response

Topic	Accounting Metric	Response
Product Safety	Percentage of models rated by NCAP programs with overall 5-star safety ratings, by region.	See pages 71–89 for our discussion of vehicle safety. See page 74 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 2022 (how many of those were software only): 18 (61%) Number of U.S. vehicles affected in 2022 (how many of those were software only): 1,213,056 (97%) Number of Global recalls in 2022 (how many of those were software only): 24 (58%) Number of Global vehicles affected in 2022 (how many of those were software only): 2,183,003 (97%)
Labor Practices	Percentage of active workforce covered under collective-bargaining agreements.	No Tesla employees; employees of some contractors and service providers are covered by CBAs.
	(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.	See pages 31-35 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 2022, we delivered 1,313,851 vehicles.
	Discussion of strategy for managing fleet fuel economy and emissions risks and opportunities.	See page 22.
Materials Sourcing	Description of the management of risks associated with the use of critical materials.	See Supply Chain section, pages 165-175.
Materials Efficiency and Recycling	Total amount of waste from manufacturing, percentage recycled.	See page 58.
	Weight of end-of-life material recovered, percentage recycled.	We make the best effort to recycle every battery pack we can. See pages 161-162 for a discussion on recycling. Tesla is still working to collect end-of-life data as our vehicles are relatively new in the auto market.
	Average recyclability of vehicles sold.	See page 162 for a discussion on recycling.
Number of Vehicles Manufactured		**1,369,611**
Number of Vehicles Sold		**1,313,851**

Key Metrics

GHG Emissions

Scope 1&2 Emissions ($mtCO_2e$)	2022		2021	
	Scope 1	Scope 2	Scope 1	Scope 2
Manufacturing	148,000	305,000	124,000	342,000
SSD	27,000	74,000	31,000	35,000
Other	27,000	29,000	30,000	26,000
Total	202,000	408,000	185,000	403,000

GHG Emissions ($mtCO_2e$/vehicle)	2022	2021
	.35	.50

YoY Manufacturing Emissions Reduction/Vehicle	-29%

Scope 3 Emissions (tCO_2e)	2022	2021
Category 1: Purchased Goods & Services	22,334,000	
Category 3: Fuel & Energy Related Activities	227,000	
Category 4: Upstream Transportation & Distribution	557,000	
Category 5: Waste Generated in Operations	478,000	
Category 6: Business Travel	37,000	
Category 7: Employee Commuting	608,000	
Category 8: Upstream Leased Assets	77,000	
Category 9: Downstream Transportation & Distribution	2,373,000	
Category 11: Use of Sold Products	3,409,000	1,954,000

Key Metrics

Waste Generated in Manufacturing

Waste Generated in Global Manufacturing (2022;tons)	2022 Diverted from Disposal	2022 Diverted to Disposal	2021 Diverted from Disposal	2021 Diverted to Disposal
Hazardous Waste	6,329	22,910	14,432	20,502
Non-Hazardous Waste	311,348	43,305	254,541	15,701
Total Waste Generated	317,677	69,215	268,973	36,203

Waste Generated in Vehicle Manufacturing (2022;tons per vehicle)	Diverted from Disposal	Diverted to Disposal	Diverted from Disposal	Diverted to Disposal
Hazardous Waste	.005	.018	.014	.022
Non-Hazardous Waste	.244	.036	.271	.016
Total Waste Generated	.249	.054	.285	.038

YoY Reduction Total Waste/Vehicle -8%

Water Withdrawal for Manufacturing (cubic meters)

Total Freshwater Withdrawal	2022	2021	2020
Major Manufacturing Sites	3,363,398	2,874,904	2,082,163

Total Freshwater Withdrawal per vehicle	2022	2021	2020
Major Manufacturing Sites	2.57	3.02	3.10

YoY Reduction Total Water/Vehicle -15%

Uptime of Tesla Supercharger Sites

Uptime of Supercharger Sites	2022	2021	2020
Uptime	99.95%	99.96%	99.74%

Vehicle Safety

Number of Vehicular Accidents Per Million Miles Driven (2022)	
Autopilot Engaged	0.18
FSD Engaged	0.31
No Active Safety	0.68
Total US Vehicle Fleet	1.53

Environment, health and safety awards

Take Charge

Runner-up for the
Innovation Award

Tesla Employee
Sachin Malik

Top Award

2022 Applied Ergonomics Conference

Ergo Cup winner for Engineering / Ergonomist Workplace Solution



Gigafactory Shanghai

Shanghai Healthy Enterprise
Advanced Fire Protection Organization
Advanced Security Organization

Diversity EEO-1 table

The tables below show Tesla employee distribution compared to average employee distribution of U.S. auto manufacturing and tech companies. Values that are higher than the tech company average distribution are shown with positive values and violet shading; values that are lower than the average are shown with negative values and red shading.

Tesla data is representative of calendar year 2021—the latest available EEO-1 filing as of the publishing of this report. Figures for peer benchmarking were sourced from the latest available EEO-1 disclosure on each company's website. For comparability, all figures were converted to percentages of total workforce.

Figures for each Tech and Automotive industry were calculated based on an average of the percentages for the companies in each respective industry.

Tables on page 211-212 represent the difference in representation in Tesla's workforce across each category.

Tech company average: Adobe, Alphabet, Amazon, Apple, Cisco, Meta, HPE, Lyft, Microsoft, Netflix, Nvidia, Oracle, Qualcomm, Salesforce and Uber.

Automotive company average: Ford and General Motors.

Diversity EEO-1 table

*Data only includes U.S. employees (Active/On Leave as of 12/31/2021) who identified their Gender as Male or Female, and also identified Race in their profile

Job Categories	Total								Male								Female							
	White	Hispanic or Latino	Black or African American	Native Hawaiian	Asian	American Indian	Two or More Races	Overall Totals	White	Hispanic or Latino	Black or African American	Native Hawaiian	Asian	American Indian	Two or More Races	Total Male	White	Hispanic or Latino	Black or African American	Native Hawaiian	Asian	American Indian	Two or More Races	Total Female
Service Workers	35%	31%	9%	4%	15%	0%	6%	100%	24%	21%	8%	3%	13%	0%	3%	73%	11%	10%	1%	1%	2%	0%	2%	27%
Laborers & Helpers	34%	43%	12%	2%	3%	1%	5%	100%	33%	42%	11%	2%	3%	1%	4%	96%	1%	1%	1%	0%	0%	0%	0%	4%
Operatives	20%	35%	17%	3%	18%	1%	5%	100%	15%	25%	12%	2%	13%	1%	3%	71%	5%	11%	5%	1%	5%	1%	2%	29%
Craft Workers	32%	39%	9%	2%	13%	1%	4%	100%	32%	38%	8%	2%	12%	1%	4%	97%	0%	1%	1%	0%	1%	0%	0%	3%
Administrative Support	42%	23%	9%	2%	18%	1%	5%	100%	31%	18%	6%	1%	13%	0%	4%	73%	11%	5%	3%	1%	5%	0%	2%	27%
Sales Workers	46%	23%	10%	1%	13%	0%	6%	100%	31%	18%	6%	1%	13%	0%	4%	71%	12%	7%	3%	0%	4%	0%	2%	29%
Technicians	40%	29%	7%	2%	16%	1%	5%	100%	37%	27%	6%	2%	14%	1%	4%	92%	3%	2%	1%	0%	2%	0%	0%	8%
Professionals	43%	10%	3%	0%	40%	0%	4%	100%	35%	8%	2%	0%	29%	0%	3%	100%	8%	2%	1%	0%	11%	0%	1%	23%
First/Mid Officials & Mgrs	57%	15%	6%	1%	17%	0%	4%	100%	45%	12%	4%	1%	12%	0%	3%	79%	11%	3%	1%	0%	5%	0%	1%	21%
Exec/Sr. Officials & Mgrs	60%	4%	3%	0%	28%	1%	3%	100%	49%	4%	1%	0%	23%	1%	3%	80%	10%	0%	3%	0%	5%	1%	1%	20%
Total	33%	28%	11%	2%	21%	1%	5%	100%	27%	22%	8%	2%	15%	1%	3%	77%	6%	6%	3%	1%	5%	1%	1%	20%

Tesla vs. Autos

Job Categories	Total								Male								Female							
	White	Hispanic or Latino	Black or African American	Native Hawaiian	Asian	American Indian	Two or More Races	Overall Totals	White	Hispanic or Latino	Black or African American	Native Hawaiian	Asian	American Indian	Two or More Races	Total Male	White	Hispanic or Latino	Black or African American	Native Hawaiian	Asian	American Indian	Two or More Races	Total Female
Service Workers	-30%	25%	-15%	4%	13%	-1%	3%	0%	-23%	17%	-10%	3%	12%	-1%	1%	0%	-7%	7%	-4%	1%	1%	0%	2%	0%
Laborers & Helpers	-20%	34%	-24%	2%	3%	1%	4%	0%	-14%	35%	-14%	1%	3%	1%	4%	15%	-6%	-1%	-10%	0%	0%	0%	0%	-15%
Operatives	-38%	30%	-16%	3%	17%	1%	4%	0%	-29%	21%	-8%	2%	13%	1%	2%	1%	-9%	9%	-8%	1%	5%	0%	1%	-1%
Craft Workers	-53%	36%	-1%	2%	12%	1%	3%	0%	-50%	35%	0%	2%	11%	0%	3%	2%	-3%	1%	-1%	0%	1%	0%	0%	-2%
Administrative Support	-32%	20%	-11%	2%	17%	1%	4%	0%	-11%	16%	-4%	1%	12%	0%	3%	19%	-21%	4%	-7%	0%	5%	0%	1%	-19%
Sales Workers	-26%	15%	-5%	1%	10%	0%	4%	0%	-22%	10%	-2%	1%	7%	0%	3%	-3%	-4%	5%	-3%	0%	3%	0%	2%	3%
Technicians	-48%	26%	2%	2%	14%	1%	3%	0%	-45%	24%	2%	2%	12%	0%	3%	-1%	-3%	2%	0%	0%	2%	0%	0%	1%
Professionals	-24%	5%	-3%	0%	20%	0%	2%	0%	-16%	4%	-2%	0%	15%	0%	2%	3%	-8%	1%	-2%	0%	5%	0%	0%	-3%
First/Mid Officials & Mgrs	-18%	11%	-5%	1%	8%	0%	3%	0%	-13%	9%	-3%	1%	6%	0%	2%	3%	-5%	2%	-2%	0%	2%	0%	1%	-3%
Exec/Sr. Officials & Mgrs	-24%	0%	-2%	0%	22%	1%	3%	0%	-14%	1%	-3%	0%	18%	0%	2%	4%	-9%	-1%	0%	0%	4%	1%	1%	-4%
Total	-33%	23%	-9%	2%	13%	1%	3%	0%	-25%	18%	-5%	2%	10%	0%	2%	3%	-8%	5%	-5%	0%	3%	0%	1%	-3%

Tesla vs. Tech

Job Categories	Total								Male								Female							
	White	Hispanic or Latino	Black or African American	Native Hawaiian	Asian	American Indian	Two or More Races	Overall Totals	White	Hispanic or Latino	Black or African American	Native Hawaiian	Asian	American Indian	Two or More Races	Total Male	White	Hispanic or Latino	Black or African American	Native Hawaiian	Asian	American Indian	Two or More Races	Total Female
Service Workers	8%	-10%	-10%	3%	7%	0%	3%	0%	6%	-6%	-8%	3%	8%	0%	1%	4%	2%	-4%	-2%	0%	-1%	0%	1%	-4%
Laborers & Helpers	-25%	28%	1%	2%	-7%	0%	2%	0%	12%	38%	6%	2%	-5%	1%	3%	55%	-37%	-10%	-5%	0%	-2%	-1%	-1%	-55%
Operatives	-12%	11%	9%	2%	-15%	1%	4%	0%	-5%	16%	7%	2%	0%	1%	2%	23%	-8%	-4%	2%	1%	-16%	0%	1%	-23%
Craft Workers	-22%	23%	2%	2%	-6%	0%	2%	0%	-16%	24%	3%	2%	-3%	0%	2%	12%	-7%	0%	-1%	0%	-4%	0%	0%	-12%
Administrative Support	-8%	6%	-3%	1%	3%	0%	1%	0%	16%	12%	2%	1%	7%	0%	2%	41%	-25%	-6%	-5%	0%	-4%	0%	-1%	-41%
Sales Workers	-21%	13%	2%	1%	1%	0%	3%	0%	-10%	10%	2%	1%	2%	0%	2%	7%	-11%	3%	0%	0%	-1%	0%	1%	-7%
Technicians	-14%	16%	0%	1%	-4%	0%	2%	0%	-9%	17%	1%	1%	2%	0%	2%	14%	-5%	-1%	-1%	0%	-7%	0%	0%	-14%
Professionals	-1%	4%	-2%	0%	-3%	0%	1%	0%	4%	4%	-1%	0%	0%	0%	1%	9%	-5%	0%	-1%	0%	-3%	0%	0%	-9%
First/Mid Officials & Mgrs	0%	9%	2%	1%	-14%	0%	2%	0%	7%	8%	2%	1%	-9%	0%	2%	11%	-7%	1%	0%	0%	-5%	0%	0%	-11%
Exec/Sr. Officials & Mgrs	-9%	0%	0%	0%	5%	1%	2%	0%	-1%	1%	-2%	0%	6%	1%	2%	7%	-8%	-1%	1%	0%	-1%	1%	0%	-7%
Total	-16%	20%	5%	2%	-13%	1%	2%	0%	-6%	17%	5%	1%	-7%	0%	2%	11%	-9%	3%	0%	0%	-6%	0%	0%	-11%

Grievance and Remedy

To ensure effective grievance channels are maintained in the supply chain, we have adopted a four-point cross checking approach in Tesla's Corporate Social Responsibility Audits, which includes site observation, records review and interviews of workers and management. Example of our actions on this topic are below:

Site Observation Themes

- Clearly communicated and visible suggestion box
- Clearly communicated and visible grievance mechanism in workers' native language(s)
- Posters/leaflets in workers' native language(s) encouraging workers to provide feedback

Record Review Themes

- Effectiveness of grievance mechanism policy and procedures are assessed
- Effective policy and procedures to ensure protection of individuals who raise concerns
- Training and orientation records
- Grievance records in place for at least 12 months
- Disciplinary records
- Evidence of prompt investigation into grievances
- Evidence of prompt remediation if the claim is valid

Worker Interview Themes

- Personal or others' experience in providing feedback and management's follow-up actions, including examples of remediation
- Worker understanding of available grievance mechanisms
- Confidence in ability to confidentially report concerns
- Training received on grievance policy
- How management has assured workers of non-retaliation/fear of reprisal
- Personal or others' experience in retaliation

Management Interview Themes

- Process to communicate grievance mechanisms
- Process to monitor grievances filed, address grievances and provide remedy
- Management understanding of available grievance mechanisms
- Recent concerns raised through mechanisms and how the concerns were addressed
- Number of reported cases
- Process to protect the identity of the individual who raises a concern
- Process to prevent and monitor retaliation
- Process to consult workers in remediation
- Examples of case resolution

Resources:

- Organization for Economic Cooperation and Development National Contact Points for Responsible Business Conduct
- Responsible Business Alliance's Grievance Mechanism
- Responsible Minerals Initiative's Minerals Grievance Platform

Forward-Looking Statements

Certain statements in this report, including statements relating to the future development, ramp, production capacity, efficiency and output rates, supply chain, demand and market growth, cost, pricing and profitability, deliveries, deployment, availability and other features and improvements and timing of existing and future Tesla products and technologies such as Model 3, Model Y, Model X, Model S, Cybertruck, Tesla Semi, our next-generation vehicle platform, our Autopilot, Full Self-Driving and other vehicle software and AI enabled products, our battery cells, our Supercharging network and our energy storage and solar products; and statements regarding expansion, improvements and/or ramp and related timing at our factories are "forward-looking statements" that are subject to risks and uncertainties.

Information on potential factors that could affect our results is included from time to time in our Securities and Exchange Commission filings and reports, including the risks identified under the section captioned "Risk Factors" in our annual report on Form 10-K filed with the SEC on January 31, 2023. Tesla disclaims any obligation to update information contained in these forward-looking statements whether as a result of new information, future events or otherwise.

08

Management Assertion

2022

Report of independent accountants

To the Board of Directors of Tesla Inc.

We have reviewed the accompanying Tesla, Inc. (Tesla) management assertion that the greenhouse gas (GHG) emissions metrics for the year ended December 31, 2022 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.

Our firm applies the Statements on Quality Control Standards established by the AICPA and, accordingly, maintains a comprehensive system of quality control.

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.



San Jose, California
April 21, 2023

Management Assertion
Scope 1 & 2 GHG emissions

Overview

With respect to the greenhouse gas (GHG) emissions metrics for the year ended December 31, 2022, presented in table 2 below, which are also included in this Tesla Impact Report 2022 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) and Superchargers (electric vehicle fast charging stations) are not included in our boundary as Tesla does not consider having operational control over these emissions. Data for 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	Accounting Metric
Manufacturing	• 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)	• Sell products, provide vehicle service, store parts for vehicle service, and deliver vehicles.
Other	• 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.	202,000 Metric Tons CO2e
Scope 2 GHG Emissions (location-based)[5] Indirect GHG emissions from the generation of electricity and district heating purchased by Tesla for site operations.	408,000 Metric Tons CO2e

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 (cont.)

4 Related to Scope 1 GHG emissions:

- 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 2022 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 2022.
- 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 2022.
- Emissions from refrigerant loss to the atmosphere:
  Fugitive emissions from refrigeration, air conditioning, or similar equipment results 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 2022.
  IPCC Fifth Assessment Report 2013.
  Honeywell Case Study 2014.
- 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 CO_2 emissions are calculated, because Tesla does not have detailed information on what type of vehicles were rented and miles driven. CO_2 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, 2022.

Management Assertion
Scope 1 & 2 GHG Emissions

GHG Emissions Disclosure (cont.)

- 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, 2022.
- Emission factors: U.S. EPA Emission Factors for Greenhouse Gas Inventories 2022.

- 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.
  - Estimated emissions from the sources above account for approximately 4.4% of Scope 1 GHG emissions.
  - Excluded Scope 1 GHG emissions: Tesla excluded the following sources of GHG emissions, which are estimated to represent less than 5 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 (cont.)

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 2022 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 (cont.)

- Emission Factors:
  - Electricity:
    - Canada: Environment Canada. 2022 National inventory report: greenhouse gas sources and sinks in Canada.
    - United Kingdom (UK): UK database published by the Department for Environment Food & Rural Affairs (DEFRA) 2022.
    - U.S.: U.S. EPA Emission Factors for Greenhouse Gas Inventories 2022.
    - Shanghai: Shanghai Municipal Bureau of Ecology and Environment 2022.
    - All other countries: International Energy Agency (IEA) Emissions Factors 2021.
  - District Heating:
    - U.S. EPA Emission Factors for Greenhouse Gas Inventories 2022.
- Estimated emissions from the source above account for approximately 10% of Scope 2 GHG emissions.