Tesla's diversity data (EEO-1) vs. U.S. tech companies

Diversity data requires context. We have compared our diversity data with that of other tech companies. In nearly all categories, Tesla's representation of people of color exceeds that of peer companies.

We are working to increase gender representation throughout the company by supporting women-focused organizations and conferences like Society of Women Engineers, Latinas In Tech, TechUp For Women, Silicon Valley Forum, Women in Technology Festival, Women in Technology International and Women in Manufacturing. We also launched Tesla Recharge Returnship Program – a four-month paid work program that initially targeted women impacted by the pandemic and later expanded to support all mid-career professionals transitioning back into the workforce after a leave of one year or more.

The table below shows Tesla employee distribution compared to average employee distribution of U.S. tech companies. Values that are higher than the tech company average distribution are shown with positive values and green shading. Values that are lower than the average are shown with negative values and yellow shading.

Job Categories	Total								Male								Female							
	White	Hispanic or Latino	Black or African American	Native Hawaiian Or Pacific Islander	Asian	American Indian or Alaska Native	Two or More Races	**Overall Totals**	White	Hispanic or Latino	Black or African American	Native Hawaiian Or Pacific Islander	Asian	American Indian or Alaska Native	Two or More Races	**Total Male**	White	Hispanic or Latina	Black or African American	Native Hawaiian Or Pacific Islander	Asian	American Indian or Alaska Native	Two or More Races	**Total Female**
Service Workers	6%	-4%	-9%	1%	5%	0%	1%	**0%**	3%	-5%	-8%	2%	11%	0%	-1%	**2%**	3%	1%	-1%	0%	-6%	0%	2%	**-2%**
Laborers & Helpers	-39%	27%	6%	2%	-1%	1%	4%	**0%**	-20%	30%	10%	2%	0%	1%	4%	**27%**	-19%	-3%	-4%	0%	0%	0%	0%	**-27%**
Operatives	-19%	16%	5%	2%	-8%	1%	3%	**0%**	-10%	13%	4%	1%	7%	0%	2%	**19%**	-9%	2%	0%	1%	-15%	0%	1%	**-19%**
Craft Workers	-13%	17%	-5%	2%	-3%	0%	3%	**0%**	0%	19%	1%	2%	-1%	0%	3%	**24%**	-13%	-2%	-6%	0%	-2%	0%	0%	**-24%**
Administrative Support	-11%	5%	-3%	1%	6%	0%	1%	**0%**	15%	10%	1%	1%	9%	0%	2%	**38%**	-26%	-4%	-4%	0%	-2%	0%	-1%	**-38%**
Sales Workers	-17%	9%	3%	1%	1%	0%	3%	**0%**	-6%	7%	3%	1%	3%	0%	2%	**10%**	-11%	2%	0%	0%	-1%	0%	1%	**-10%**
Technicians	-8%	10%	0%	2%	-6%	0%	1%	**0%**	-5%	11%	0%	2%	1%	0%	1%	**11%**	-3%	-1%	-1%	0%	-7%	0%	0%	**-11%**
Professionals	1%	3%	-1%	0%	-5%	0%	1%	**0%**	6%	3%	0%	0%	-2%	0%	1%	**7%**	-4%	0%	-1%	0%	-3%	0%	0%	**-7%**
First/Mid Officials & Mgrs	5%	6%	2%	1%	-15%	0%	2%	**0%**	10%	6%	2%	1%	-10%	0%	1%	**9%**	-5%	0%	0%	0%	-4%	0%	0%	**-9%**
Exec/Sr. Officials & Mgrs	-4%	1%	0%	0%	2%	2%	0%	**0%**	1%	1%	-1%	0%	2%	1%	0%	**5%**	-6%	0%	1%	0%	-1%	1%	0%	**-5%**
Total	**-13%**	**15%**	**2%**	**2%**	**-7%**	**1%**	**1%**	**0%**	**-2%**	**13%**	**3%**	**1%**	**-2%**	**0%**	**1%**	**16%**	**-11%**	**1%**	**-2%**	**0%**	**-4%**	**0%**	**0%**	**-16%**

Tesla data are representative of calendar year 2020 – the latest available EEO-1 filing as of the publishing of this report. Competitor data is based on their latest publicly available disclosure. For a detailed explanation of our comparison methodology, please see page 134 of this report.

Tesla's diversity data (EEO-1) vs. U.S. automotive companies

The diversity gap is even more pronounced when compared to automotive manufacturers. In nearly every job category, our employee base is more racially diverse than the automotive industry average. This is partially a function of the location of our factories. That said, our journey towards diversity, equity and inclusion is not finished and we continue to develop programs to make sure our employee base reflects the diversity of our country's population.

The table below shows Tesla employee distribution compared to average employee distribution of U.S. automotive companies. Values that are higher than the Automotive company average distribution are shown with positive values and green shading. Values that are lower than the average are shown with negative values and yellow shading.

Job Categories	Total								Male								Female							
	White	Hispanic or Latino	Black or African American	Native Hawaiian Or Pacific Islander	Asian	American Indian or Alaska Native	Two or More Races	**Overall Totals**	White	Hispanic or Latino	Black or African American	Native Hawaiian Or Pacific Islander	Asian	American Indian or Alaska Native	Two or More Races	**Total Male**	White	Hispanic or Latina	Black or African American	Native Hawaiian Or Pacific Islander	Asian	American Indian or Alaska Native	Two or More Races	**Total Female**
Service Workers	-26%	24%	-14%	2%	13%	-1%	1%	0%	-28%	16%	-14%	2%	15%	-1%	-1%	-11%	1%	8%	0%	0%	-1%	0%	2%	11%
Laborers & Helpers	-21%	27%	-19%	2%	5%	0%	5%	0%	-16%	28%	-10%	2%	4%	0%	4%	13%	-5%	-1%	-9%	0%	1%	0%	0%	-13%
Operatives	-32%	25%	-18%	3%	19%	1%	3%	0%	-24%	17%	-9%	2%	14%	0%	2%	2%	-8%	8%	-9%	1%	5%	0%	1%	-2%
Craft Workers	-45%	29%	0%	2%	10%	0%	4%	0%	-42%	29%	0%	2%	10%	0%	4%	2%	-3%	1%	-1%	0%	0%	0%	0%	-2%
Administrative Support	-29%	15%	-15%	2%	22%	0%	4%	0%	-1%	13%	-4%	1%	15%	0%	3%	26%	-27%	2%	-10%	1%	7%	0%	1%	-26%
Sales Workers	-21%	11%	-5%	1%	9%	0%	4%	0%	-18%	7%	-2%	1%	6%	0%	3%	-4%	-3%	4%	-2%	0%	3%	0%	2%	4%
Technicians	-43%	19%	2%	2%	15%	0%	4%	0%	-41%	18%	2%	2%	13%	0%	3%	-2%	-2%	2%	0%	0%	2%	0%	0%	2%
Professionals	-21%	4%	-5%	0%	20%	0%	2%	0%	-14%	3%	-2%	0%	15%	0%	2%	3%	-7%	1%	-2%	0%	5%	0%	1%	-3%
First/Mid Officials & Mgrs	-14%	7%	-4%	1%	7%	0%	3%	0%	-10%	6%	-2%	1%	4%	0%	2%	2%	-5%	1%	-2%	0%	2%	0%	1%	-2%
Exec/Sr. Officials & Mgrs	-17%	0%	-2%	0%	16%	2%	1%	0%	-13%	0%	-3%	0%	13%	0%	1%	-1%	-4%	0%	1%	0%	4%	1%	0%	1%
Total	-28%	19%	-11%	2%	14%	0%	3%	0%	-21%	15%	-5%	2%	11%	0%	2%	4%	-7%	4%	-6%	0%	3%	0%	1%	-4%

Tesla data are representative of calendar year 2020 – the latest available EEO-1 filing as of the publishing of this report. Competitor data is based on their latest publicly available disclosure. For a detailed explanation of our comparison methodology, please see page 134 of this report.

Veterans at Tesla

Drawing upon unique skills from their service, veterans play an essential role in achieving our goals. With dedicated veteran recruiting resources and professional development opportunities, we prioritize an inclusive and supportive environment for transitioning veterans. Tesla also supports numerous organizations that sponsor veteran hiring and have expanded outreach efforts throughout the country to more military bases and community organizations.

LGBTQ+

Tesla prides itself in being a great place to work for members of the LGBTQ+ community. This is demonstrated by our 7th consecutive 100% Corporate Equality Index with the Human Rights Campaign. Tracking the size of our LGBTQ+ employee base is not a straightforward task for variety of reasons, which is why we will not be sharing specific figures in this report.

Our Diversity, Equity & Inclusion governance

Our DEI governance structure supports our business operations. Our Senior Director of People engages with our Board of Directors to ensure our DEI plans are in alignment with Tesla's strategic objectives. We also integrate our talent management and learning and development into the DEI functional scope to ensure equitable talent, career and learning resources are accessible to all employees. The DEI Director reports directly to the Senior Director of People and has regular engagement with company executives across the company to ensure that DEI principles are embedded into our business. The DEI Director is responsible for all of Tesla's talent management and learning programs.

Diversity of our Board of Directors

The diverse representation on our Board of Directors sets the tone for the rest of the company.

Gender Representation – Tesla Board of Directors	
Female	Male
25%	75%

Underrepresented Communities – Tesla Board of Directors			
13%	13%	0%	75%
Asian	Black	Hispanic	White

Data are representative of calendar year 2021, as measured on December 31, 2021. Totals may not add to 100% due to rounding or individuals who selected "decline to state" or left the category blank.

Connecting communities to opportunities with Tesla

During the global pandemic, we focused a great deal on expanding our community engagement and ensuring our employees stayed connected. Specifically, we expanded our Employee Resource Groups (ERGs) and ensured our programming was accessible in a remote work environment. We welcomed Asian Pacific Islanders at Tesla to our ERG family. While this was a time of uncertainty and change, through our ERGs, we ensured our employees felt more heard and connected than ever before as they pivoted to virtual events to promote inclusion across different locations, physical boundaries and time zones.

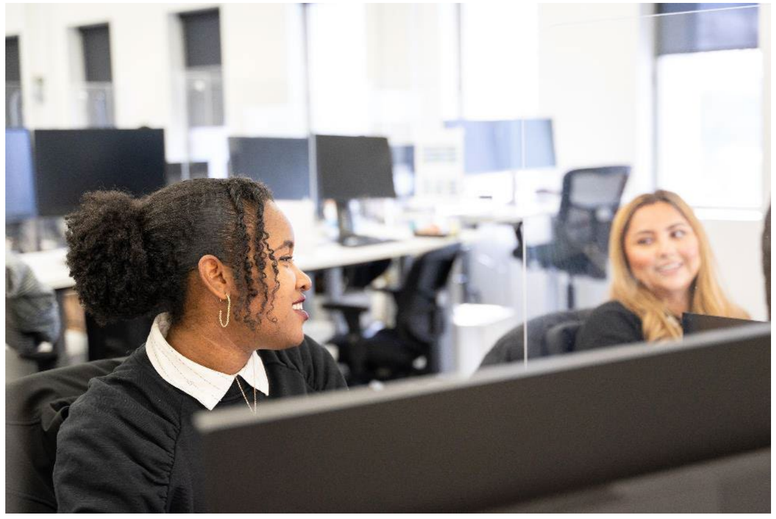
At Tesla, we strive to have a diverse supply chain and create the maximum practical opportunities to provide goods and services as a part of the corporate procurement process. We formalized collaboration between the DEI, Supply Chain and Government Affairs teams to ensure local minority, women, LGBTQ+, disabled and veteran owned businesses are connected to opportunities with Tesla. We recognize that supplier diversity creates a competitive advantage for the company and has a positive impact on the global community. As the supplier diversity program develops, we will implement plans that encourage increased usage of diverse suppliers throughout our organization, partner with internal and external stakeholders to identify opportunities for diverse suppliers and work with external partners to encourage capacity building for diverse suppliers.

People and Culture
Respectful Workplace

We strive to create an environment where people love to come to work every day. With over 100,000 employees as of March 2022, challenges arise, and we address them head on.

In 2021, we re-doubled our efforts to educate employees and managers that any form of discrimination must be reported. While our goal is always prevention, reported complaints of discrimination and harassment are promptly investigated and if substantiated, subject to discipline up to and including termination. New employees receive anti-harassment and discrimination training during orientation. A new employee guidebook was also rolled out which instructs employees to report all forms of misconduct without concern.

As the company continues to hire tens of thousands of workers per year, educating our workforce is a top priority and an ongoing process.



How we're meeting our commitments to equal opportunity employment and a diverse and inclusive environment

We believe it's essential to provide all employees with a respectful and safe working environment where all employees can achieve their potential. As a result, we do not tolerate discrimination, harassment or any mistreatment of employees in the workplace or work-related situations. Below are some of the actions we are taking to ensure the proper treatment of all employees.

Training: Code of Business Ethics and harassment & discrimination training for front-line leaders, HR partners and other employees to understand how to create and promote a respectful workplace, assess situations sooner and escalate appropriately.

Internal Tracking System Enhancement: An enhancement to our internal tracking system now allows HR to document all employee concerns that are raised to ensure there is follow through and resolution for tracking purposes. Additionally, handling concerns at the initial stage helps prevent them from becoming bigger issues. The case management system also allows the appropriate teams to review data to trend and issue spot, which then can lead to proactive solutions before concerns arise.

Internal Mobility: A program that advocates for and provides equal access to employee advancement opportunities and retention with eligibility for opportunities based on standardized performance reviews. Opportunities are advertised on an internal site with career resources in addition to a monthly newsletter. We also offer 1-on-1 support and personal consultations to understand the career aspirations of internal applicants.

Third-party managed integrity line

We encourage employees to raise concerns internally or externally. An employee can raise concerns or complaints to any member of management, Human Resources or Employee Relations (ER). If they prefer to report another way, the Integrity Line is available 24 hours a day, seven days a week. The Integrity Line allows employees to report concerns anonymously and without fear of retaliation.

If any employee raises a good faith concern, HR, together with ER, will ensure that employee concerns are investigated promptly and impartially in a manner appropriate to the circumstances. The Employee Relations 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.

Why engagement matters for retention

Employee engagement drives productivity, satisfaction and loyalty and plays a critical role in employee retention. Tesla's engagement initiatives strive to make employees feel informed, valued and respected, while company-wide open-door policies with leaders empower employees to make their ideas heard. When we feel connected to the Tesla community and mission, we unlock our full potential as a workforce.

What we are doing to keep employees engaged

To promote engagement, we lead initiatives driven by employee feedback. Throughout the year, we use roundtables, engagement surveys and other feedback forms to gather data and better understand the employee experience.

Our team uses this data to inform our communication strategies. In addition to a monthly newsletter emailed to all U.S. employees and physically posted at manufacturing sites, we launched a new company-wide internal news platform with weekly updates on company news, employee recognition and events.

We highlight business, people and safety updates via both email and an expansive network of video screens. In 2021, we also produced two live and virtual companywide all-hands.

These channels pair with the revitalization of daily Start-Up meetings for assembly workers to streamline communications across the Fremont Factory. HR members also staff on-site Answer Bar kiosks to address employee questions and concerns at many of our office locations.

Engagement requires making resources more accessible. This translates to regular on-site tabling and fairs for benefits, as well as making information available digitally. We manage internal resource websites for product knowledge, employee perks, recognition, employee volunteering, health and fitness and offer virtual info sessions with subject matter experts.

Supporting Ukraine

We are committed to providing disaster relief through product donations. Our relief efforts to the conflict in Ukraine have provided people with the ability to communicate and power communities.

In March 2022, Tesla employees in Europe volunteered to design, prototype and deploy the first 50 kits containing Powerwalls, Gateways and solar inverters to support continued energy access in Ukraine. When paired with one of the 250 solar panels dispatched by volunteers at Gigafactory Berlin, these mini power plants can assist Ukrainian communications and essential services indefinitely by using solar to recharge Powerwalls.

Along with Starlink Terminals used for satellite internet access (made by SpaceX), the kits were shipped to the Ukranian border in Poland, at which point they were transferred onto military trucks. The kit can begin providing power almost instantly, without any tools or technical experience required. With the Powerwall kit alone, a user can power Starlink for five days. With solar panels installed and operational, the kits can provide indefinite power for Starlink Terminal, plus a small appliance or laptop.

Surrounding European countries

In addition to product donations, Tesla has opened free Supercharging at all stations in Poland, Slovakia and Hungary to support those impacted by the recent events. Within hours of implementation, Tesla emailed local owners announcing that several Supercharger stations near Ukraine could be used by Tesla and non-Tesla electric vehicles, free-of-charge.

Hurricane Ida

In the aftermath of Hurricane Ida, Tesla worked with NGO partners such as the Footprint Project, and certified installers in the New Orleans Area (Solar Alternatives, Posigen) to deploy Powerwall and solar panel disaster relief systems. We deployed 14 systems to over 10 sites, including food distribution centers, churches, a warehouse, a fire station, a shelter and command center for NGOs. Most systems stayed in place for six weeks while the grid was down; in cases where the building was too damaged to return power after the grid was back up the systems remained in place for substantially longer. Our partners estimate that these systems provided power to over 1,000 people including recovery workers, food distribution volunteers and first responders.

Kentucky Storms

After the Kentucky winter storms, we deployed two systems at a research and education center in Princeton, Kentucky in partnership with the Footprint Project. These systems helped power communications trailers and mobile offices for over 50 recovery workers. They are still deployed while the center is being rebuilt and we are exploring ways to turn the trailers and mobile offices into a training center for future recovery workers.

Texas Winter Storm

In February 2021, Texas experienced a weather event that caused the widespread loss of power for several days affecting thousands of residents. Tesla provided a disaster relief system to Pathways Youth & Family Services, Inc., a non-profit social service organization providing foster care, adoption and behavioral health services to communities across Texas. The system consisted of four mobile Powerwall units (for a total of ~100kWh of batteries and 40kW of power). With this system, Pathways was able to restore heat and power to its facilities, enabling it to resume housing and other social services to children.

In 2021, our focus remained on protecting people, the planet, our property and products. We were able to improve our performance in Environmental, Health, Safety and Security (EHS&S) by turning to the experts in Tesla – our own employees. We evolved the way we define safety, developed internal tools to drive execution, actively sought worker improvement suggestions and established a more structured EHS&S audit program to identify safeguards and drive operational excellence throughout all areas of the business.

Our EHS&S strategy remains focused on three pillars:

1. Do the Basics Right | 2. Engage and Empower Our Stakeholders | 3. Reduce Risk

Changing how we define safety and build capacity: Human and Organizational Performance (HOP) and Operational Learning

As we grew and evolved as an EHS&S organization, so did our view of safety. The Human and Organizational Performance (HOP) and Operational Learning group was developed in 2021 to integrate our new view of safety into the organization.

In an ever-changing and dynamic work environment, we recognized the need to focus on creating the ability to fail safely. Creating the ability to fail safely is comprised of three components:

1. Engaged workers: workers who are connected to and care about the work they do. When workers are engaged, they are more likely to identify and communicate vulnerabilities in the system.
2. Agility: the ability to continuously navigate and adapt in an ever-changing, complex and dynamic work environment.
3. Safeguards: the hardware, software and human actions that directly prevent an event or mitigate a bad outcome.

Instead of defining safety as the absence of accidents, we define safety as the presence of capacity. Capacity can be defined as the ability to mitigate outcomes and reduce system brittleness.

48,779 submissions
72% of submissions closed with action

Develop tools to drive execution of EHS&S — MyEHS

In order to build capacity and allow our workers to fail safely, we needed a more dynamic approach to how we collect and manage data that allows us to make decisions that reduce risk. In response to that need, we developed an internal EHS&S tool named MyEHS to help drive execution and improve outcomes by allowing the intake and visualization of data globally. We designed and deployed 11 modules in 2021, allowing us to better manage our EHS&S information, identify emerging risks and take action to implement improvements suggested by our employees.

Foremost in this effort was our improvement suggestion module — Take Charge. Combined with Action Tracker, this module allows workers to submit improvement suggestions in various categories, including environment, health, safety, security, people and accuracy, while connecting with their supervisors and other work groups to identify and implement solutions to improve the presence of safeguards.

TAKE CHARGE

Meet Sherry Ihrig – Take Charge Champion

Take Charge case study — Sherry Ihrig

Leading the way with Take Charge submissions is Sherry Ihrig, with over 1,800 improvement suggestions to safety, processes, cost-savings and more since the program's start in early 2021.

"Tesla promotes the concept that 'safety is a shared responsibility,' and the Take Charge program truly empowers me to take a more active role in sharing that responsibility," Ihrig said.

"The Take Charge program encourages associates to increase their awareness of the work environment," Ihrig said. "When these and other potential safety hazards are noticed and resolved, it allows associates to improve their overall work performance."

While Ihrig has enjoyed many parts of her experience at Tesla, from teaming up with "hardworking, outgoing individuals" to learning how to operate a fire extinguisher in emergency response training, the most exciting part has been the Take Charge program.

Engaged employees like Sherry help Tesla build capacity to ensure safeguards are in place and functioning, so that when we fail, we fail safely.

COVID-19 response

Since the emergence of COVID-19 in 2019 and the subsequent variants, we have proactively protected our workers. Teams have contributed to country, state and local regulations to ensure the voice of industry was represented in the drafting and implementation of policies.

Our pandemic management team continues to engage with employees at all levels. We consistently re-examine operations through risk assessments as a key element for managing the ever-changing COVID-19 work environment. Our dedicated Infectious Disease Team aggressively monitors on-going changes across the world to stay healthy and compliant with the differences in localities.

Stats:

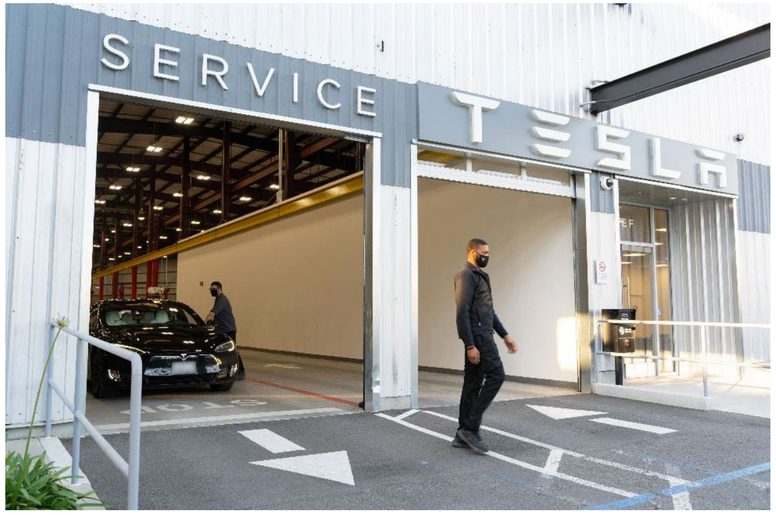
- Conducted 59 free, on-site COVID-19 vaccination clinics
- Administered 14,811 COVID-19 vaccinations
- Received vaccination and booster information from 48% of employees using our internal tracking system, helping monitor progress
- Gifted employees $86,500 in cash and prizes to encourage vaccinations

Compliance & Audit Group Established

We established the Compliance Audit Program in 2021 to provide an objective assessment of the management of EHS&S risk at a site level throughout the various businesses. We have conducted 31 audits so far that:

- Focused on compliance with Tesla EHS&S standards and regulatory requirements
- Engaged site-level EHS&S professionals to audit other Tesla sites, maximizing technical knowledge across the businesses
- Identified best practices that can be replicated across other sites
- Provided guidance and assistance to sites addressing and closing out corrective and preventive actions

The audit outcomes provided opportunities for workers to identify and employ improvement solutions, adjust to the changing work environment where necessary, verify and validate existing safeguards, and implement new safeguards and improve our overall capacity.



U.S. Occupational Safety and Health Administration (OSHA) Voluntary Protection Program (VPP) application accepted in GF Nevada

Gigafactory Nevada became the first Tesla site to have a Voluntary Protection Program (VPP) application accepted. VPP is an OSHA program that recognizes employers in the private industry who have implemented effective safety and health management systems and maintain injury and illness rates below national Bureau of Labor Statistics averages for their respective industries. Next step will be a rigorous onsite evaluation by a team of health and safety professionals in May 2022.

Security

Security of our people, the planet, our property and products continues to be a core factor to enable production execution and build capacity throughout our entire organization.

Our manufacturing locations have dedicated physical and technical security teams, while at our service centers and remote sites, we augment physical security with our SHIELD ambassadors. SHIELD is Tesla's Security Ambassador project that helps increase security awareness at all Tesla locations, especially those without an on-site security team.

The Tesla SHIELD program is designed to educate individuals with the basic security requirements for their building, to allow them to present the issues to their site manager for resolution and be able to escalate larger issues to the Security Team for support.

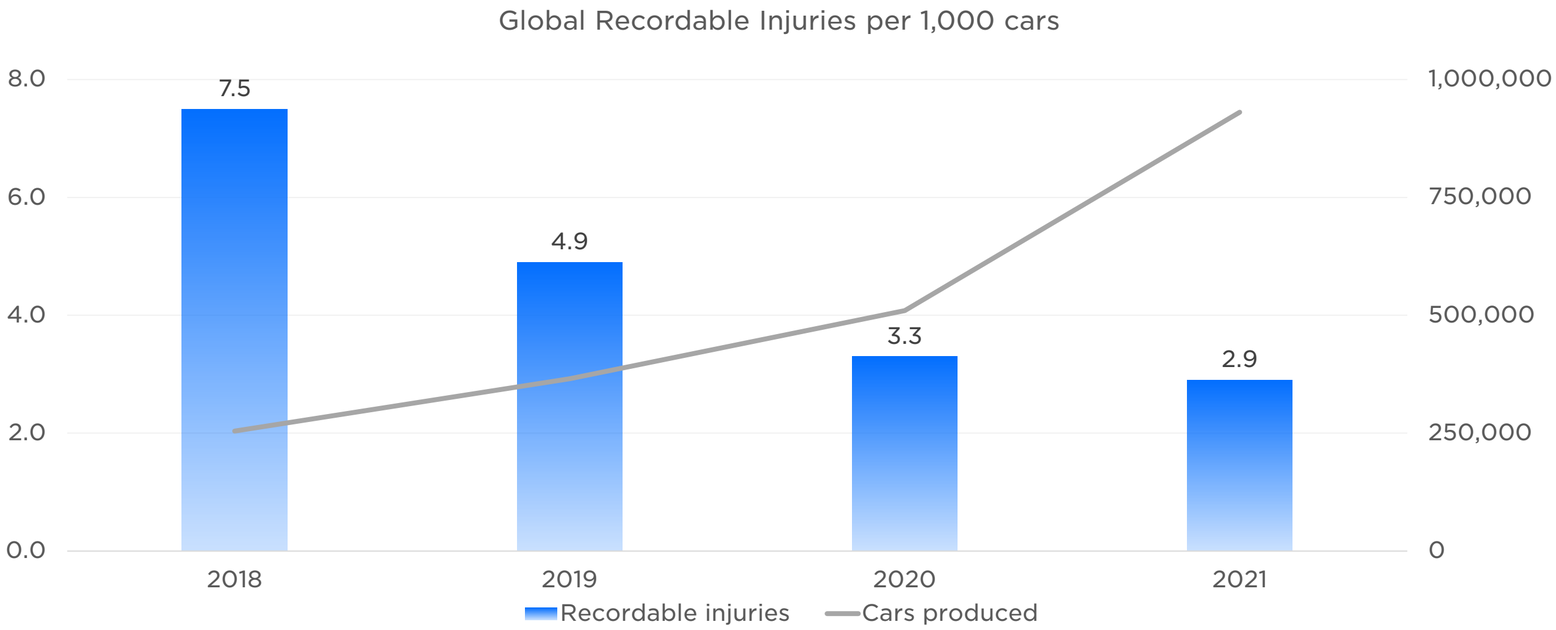
- 271 Security SHIELD Ambassadors registered at 176 locations across 24 countries to help support on-site security needs
- 37,154 workers trained in basic security and awareness courses

As our production volumes increase, focus on safety remains strong

As we continue to increase production, our focus remains on maintaining positive safety records. We examine our safety data to identify emerging risks, comparable events for innovative solutions and to better understand how we can systematically improve across our highest risk areas to help keep our people, the planet, our products and property safe.

We have turned our attention away from traditional OSHA metrics, but we continue to maintain information on them for regulatory purposes. We use these metrics, amongst many others, to examine how how we can see the results of our commitment to safety.

This will be the last year that we present recordable injuries per car produced – which captures all injuries and illness regardless of their severity or relation to work. Instead, we will use the American Society for Testing and Materials (ASTM) standard E2920-19. ASTM better represents our global reach and more clearly illuminates serious injuries and illnesses, allowing our focus to remain on preventing and mitigating outcomes of our highest-risk activities.

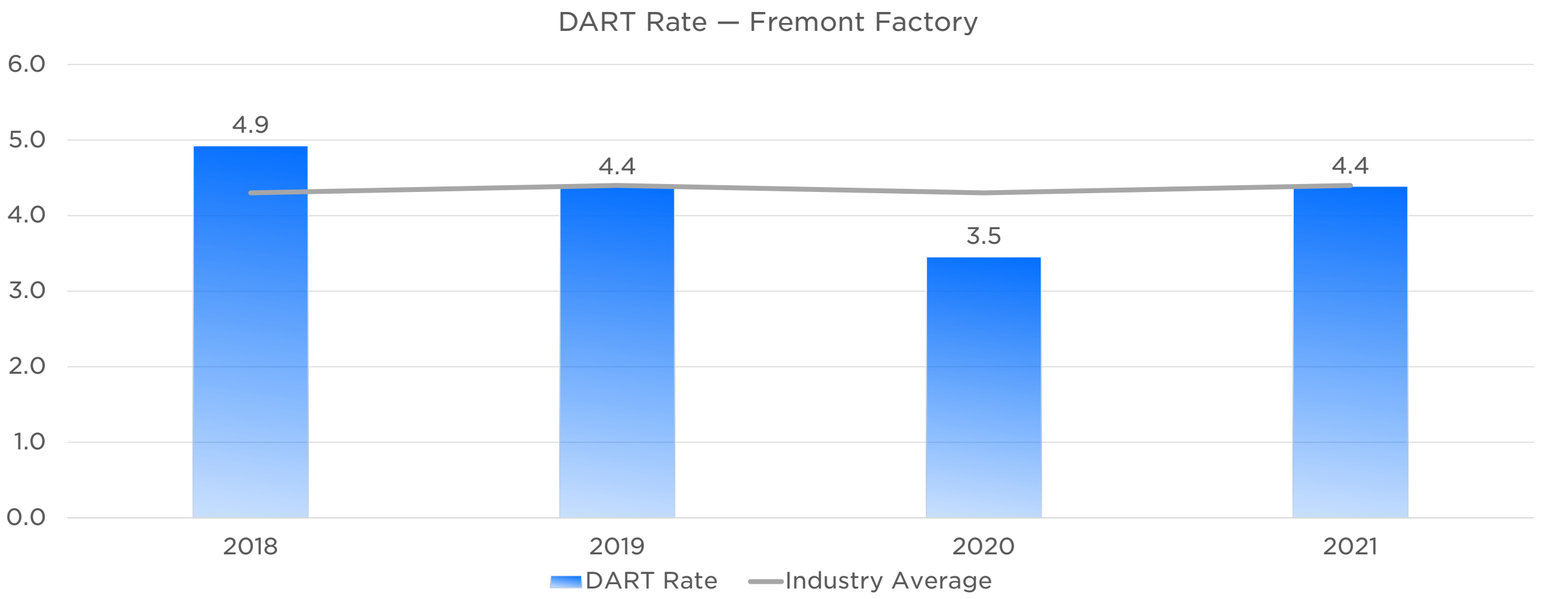


Fremont Factory DART rate stays below industry average

As our manufacturing footprint expanded into Austin and Berlin, and our Shanghai location accelerated production, Fremont continued with the unwavering manufacturing of all Tesla cars.

Fremont Days Away, Restricted or Transferred (DART) rate has remained below the North American Industry Classification System (NAICS) average for automobile manufacturing for the previous three years and continues to drive performance through the integration of safety in design and the verification and validation of safeguards.

In order to concentrate on the events that matter most, we have made great efforts to increase our focus on events of significant consequence. We continue to track and report on OSHA statistics for our U.S.-based sites, such as DART rates for more serious injuries/illnesses, but we are shifting our view to be more forward thinking and globally inclusive.

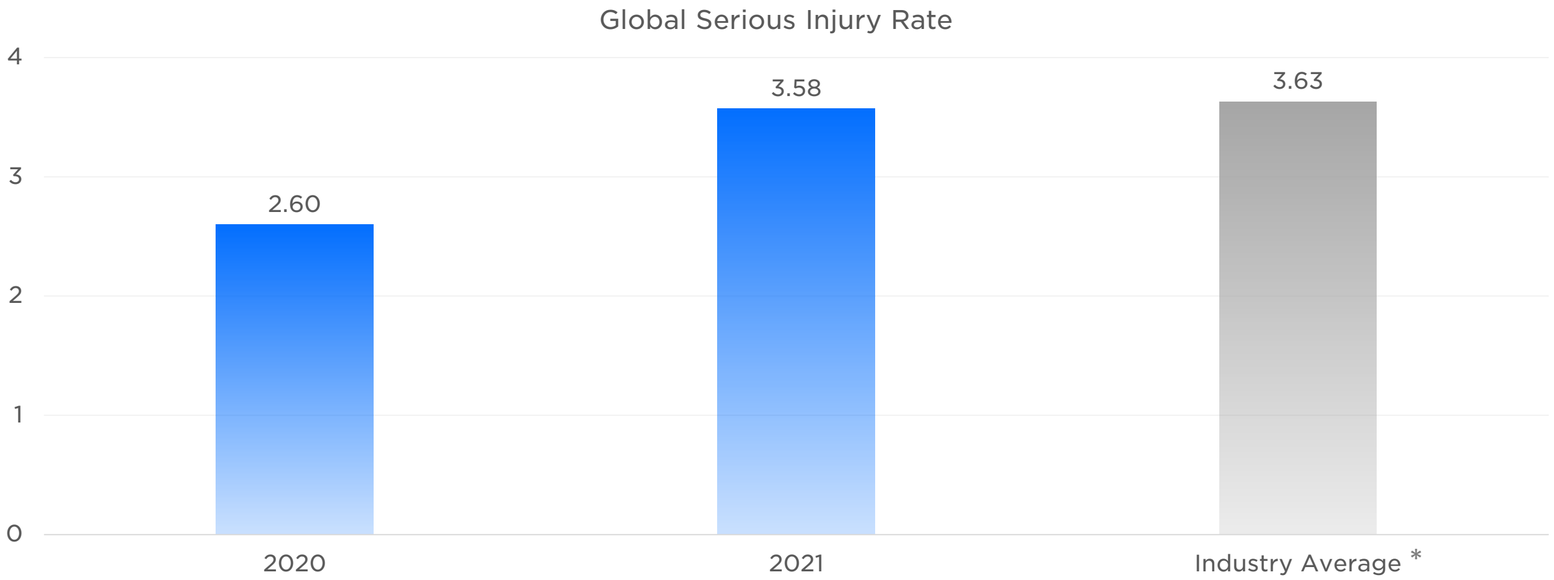


How we measure success globally — prevention of serious injuries and fatalities

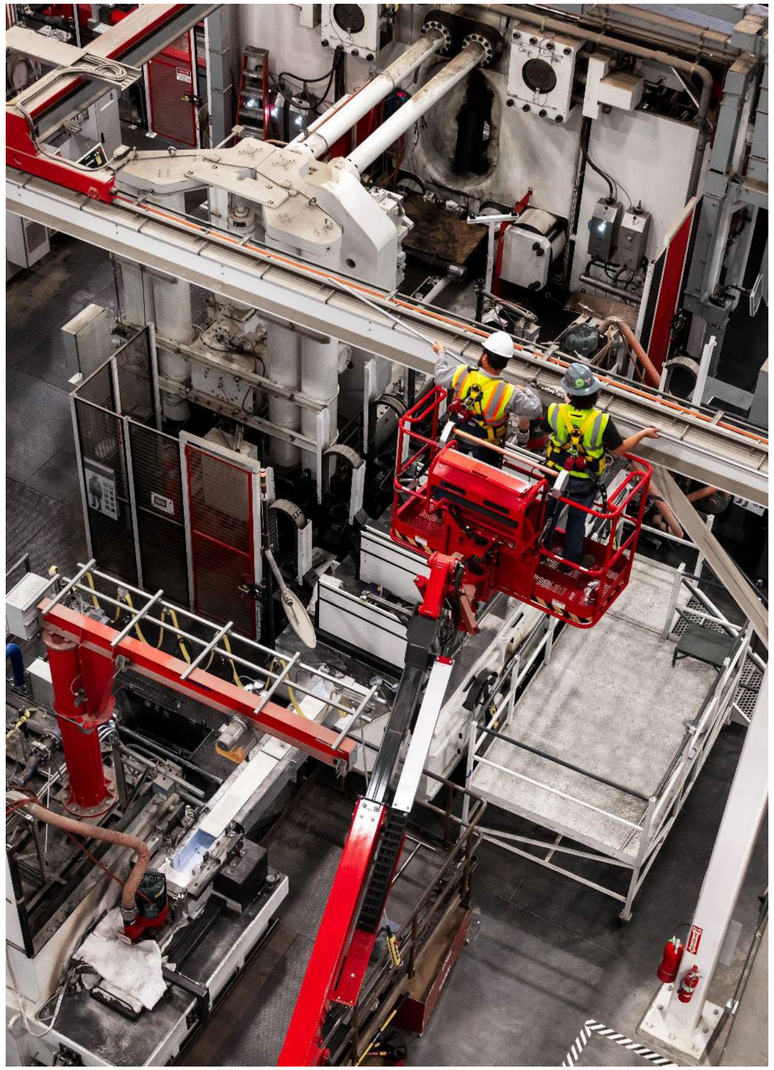
We transitioned to the ASTM standard E2920-19 as our global metric in 2020 to better reflect our global presence and have an increased focus on serious injuries and illnesses. Other automakers have not yet adopted this standard, so we are benchmarking against other manufacturing and service industries. We made this change in response to studies indicating the statistical invalidity of previous metrics (Total Recordable Injury Rate [TRIR]) as measures of safety outcomes.

We continue to concentrate our prevention and mitigation efforts in our highest risk areas across all lines of business and are accelerating forward with our strategies to ensure essential safeguards are in place and functioning. In 2020, COVID–19 impacted our operations including the shutdown of the Fremont Factory; therefore, we are using 2021 as our baseline year.

Sadly in 2021, Tesla experienced a fatality which occurred during a vehicle test drive outside of the U.S. Extensive global actions have been implemented based on our operational learning including limiting speeds and designated test drive routes.



*Industry Average data is taken from manufacturing/service industries submitted to ORCHSE/NSC for the years 2019 & 2020



Constructing Our Future

In 2021, we kicked off our Constructing Our Future initiative that focused on empowering our project teams and partners to accelerate contractor onboarding as well as to simplify our requirements to ensure work is conducted safely and effectively.

Rather than uploading a Job Hazard Analysis (JHA) completed off-site, contractors and suppliers are now expected to meet a Tesla Responsible Person and EHS&S professional at the location of work to complete a Pre-Work Risk Assessment.

Over 5,000 companies were onboarded, and 587 Tesla Responsible Persons (TRP) and Contractor Responsible Persons (CRP) were trained in the new process. This level of involvement resulted in increased contractor responsibility, improved communication and more thorough Pre-Work Risk Assessments, which identified critical and high-risk activities.

Shifting from a hazard-based approach to a risk-based approach provides a better opportunity for EHS&S success by discussing critical and high-risk operations.

In addition, we support the Constructing Our Future with written procedures, training resources and forms which are easily accessible to Tesla stakeholders. This strategic approach helps us create the framework necessary to build safely, efficiently and consistently.

We are on schedule to release the new and improved supplier and contractor onboarding and management system, Workforce Management, in the second quarter of 2022. This simple, scalable, centralized system will build on the efficiencies of the interim onboarding process and provide better visibility for managers and engineers to track performance.

We will report our contractor injury rates in the 2022 Impact Report.

Environmental Impact

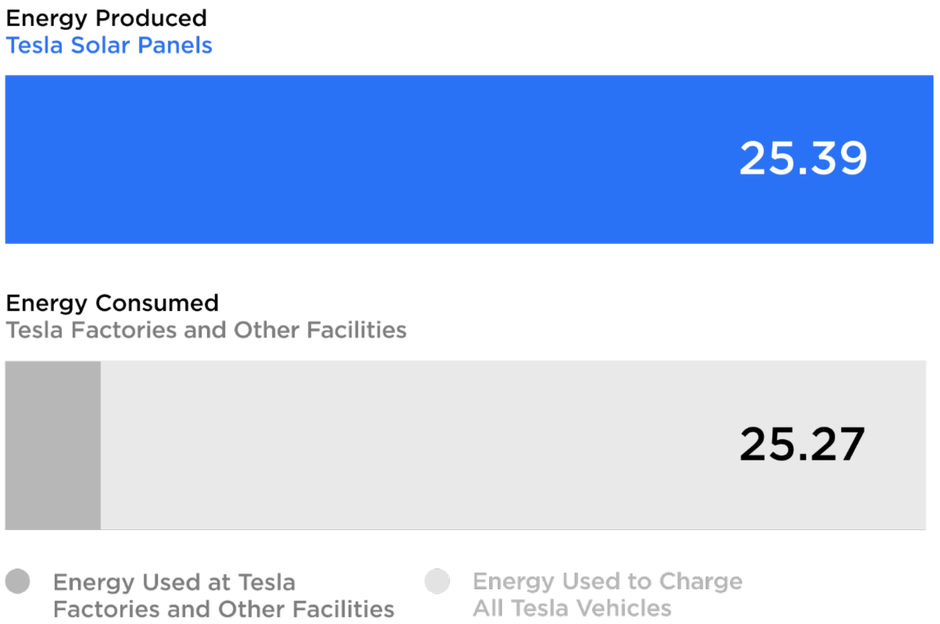
What Do We See As Impact?

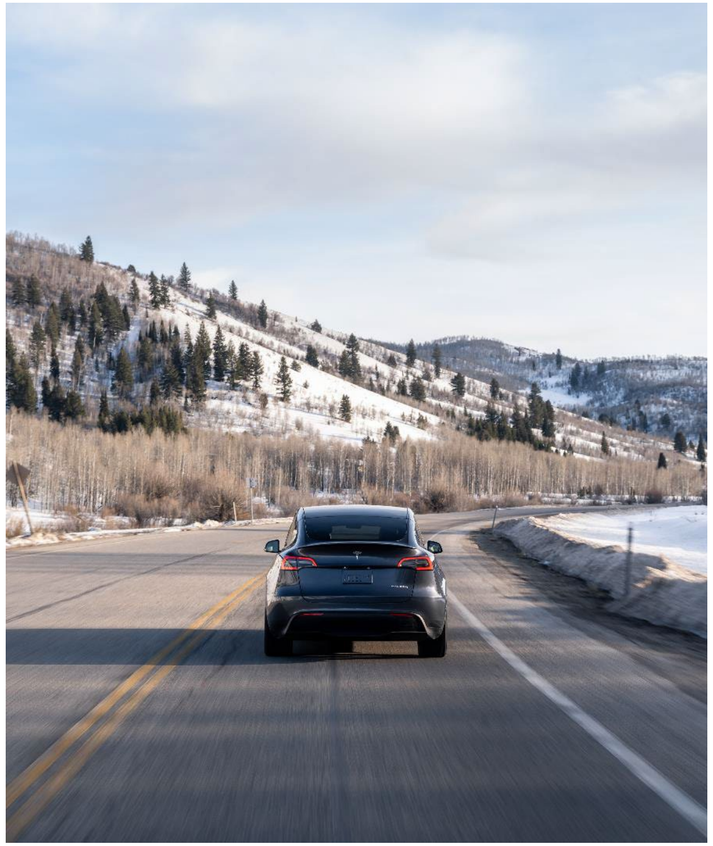
The biggest environmental impact is achieved through early displacement of ICE vehicles and replacing them with EVs. Additionally, we want to displace fossil-based energy generation with renewable energy generation.

As of the end of 2021, Tesla (including SolarCity prior to its 2016 acquisition by Tesla) has installed almost 4.0 Gigawatts of solar systems and cumulatively generated over 25.0 Terawatt-hours (TWhs) of emissions-free electricity. For reference, that is more energy generated by our installations than the total energy Tesla has used to run all our factories since we began producing Model S in 2012 and electricity used to power all of our vehicles in that same period combined.

We are striving to always remain a net contributor to renewable energy generation. It is our goal to eventually have all our manufacturing energy needs satisfied through renewable sources where possible. Additionally, we are hoping to see more Tesla vehicle customers installing solar panels or Solar Roof along with a Powerwall to meet their own energy needs in a sustainable way.

Energy Generation vs. Energy Consumption (in TWh)





6,500 miles

The manufacturing process of Model 3 and Model Y currently results in slightly higher GHG emissions than an equivalent combustion engine vehicle. However, based on the global weighted average grid mix, Model 3 and Model Y have lower lifetime emissions than an equivalent ICE after driving 6,500 miles.

In addition to an updated Lifecycle Analysis (LCA) for Model 3 and Model Y, we are reporting total Scope 1 and Scope 2 emissions and use-phase emissions of our vehicles

In this year's report we are reporting our Scope 1 (direct emissions from our facilities) and Scope 2 (purchased electricity, heat, etc. for our facilities) emissions resulting from global operations. This information is not only important to benchmark our performance against other manufacturers but is also the first step to track progress as we continue to work to decarbonize our own operations. While the most important work we can do to reduce GHG emissions is through selling as many of our products as possible, we are also committed to reducing carbon emitted from our own operations longer term. This is not only the right thing to do, but it also makes business sense as we reduce the resource intensity of our processes.

It is possible to fully decarbonize the manufacturing and use of EVs – this is economically unfeasible for ICE vehicles

We are often asked if electric vehicles (EVs) are more sustainable than internal combustion engine (ICE) vehicles. The environmental impact of zero-emission transport and energy products, like the products that Tesla produces and sells, is undeniably more positive than the GHG-emitting alternatives. This becomes more pronounced when determining the lifetime impact of EVs versus ICE vehicles, which requires looking at the entire lifecycle — from raw materials to use-phase emissions to disposal — and not just at vehicle usage emissions.

Variables often overlooked by other lifecycle studies:

- Using Worldwide Harmonized Light Vehicle Test Procedure (WLTP) or Environmental Protection Agency (EPA) fuel/energy consumption data (both of which overestimate fuel-economy and underestimate emissions) rather than real-world data
- Not considering the higher energy efficiency of Tesla's powertrains
- Assuming the average EV needs a battery replacement at some point in its life (it doesn't)
- Not considering emissions generated through the oil refining and the transportation process
- Using outdated data for the carbon impact of cell manufacturing

*For a definition of Scope 1, 2 and 3 emissions see page 135 of this report.

Lifecycle Analysis of Tesla EVs vs. Equivalent ICE Vehicles

70 tons

Lifetime CO_2e emitted by an average internal combustion engine vehicle (model year 2021) sold in the U.S. through its use-phase, excluding CO_2e emitted during the oil refining phase.

Using only real-world data, not official NEDC, WLPT or EPA[1] consumption data

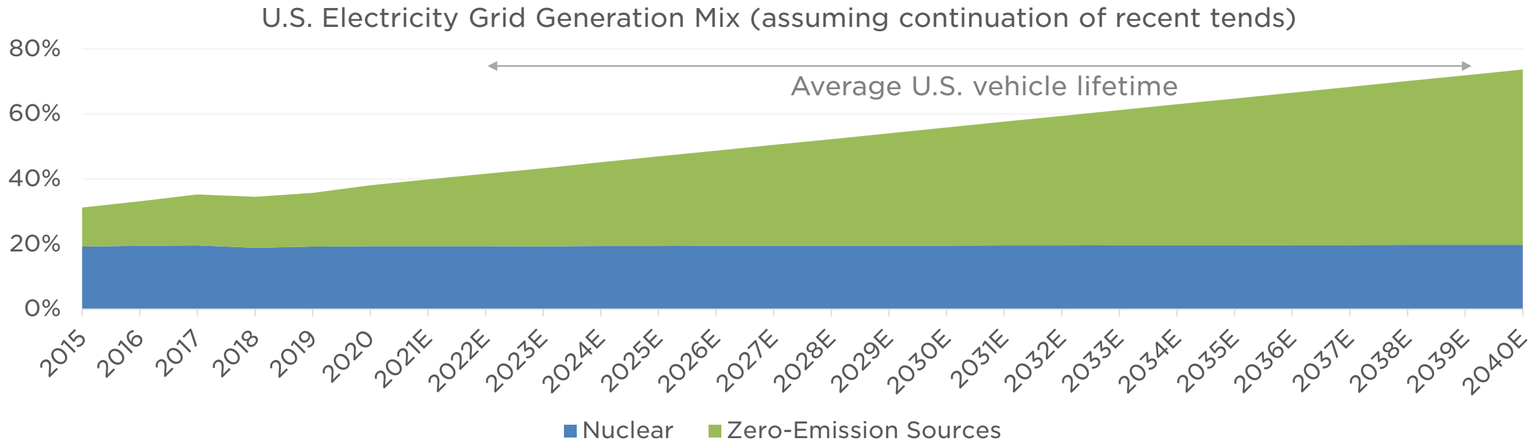
The most important variable in a lifecycle analysis of an automobile is real-world fuel consumption or electricity consumption, as applicable, which impacts the use-phase of the lifecycle. Various efficiency testing cycles such as NEDC, WLTP or EPA do not truly represent real-world fuel or energy consumption. Therefore, we used:

EV energy consumption: Real world energy consumption based on 25 billion miles traveled Tesla Model 3 and Model Y vehicles, including energy losses during the charging process.

ICE fuel consumption: Data provided by Consumer Reports, which reports model year 2020 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.

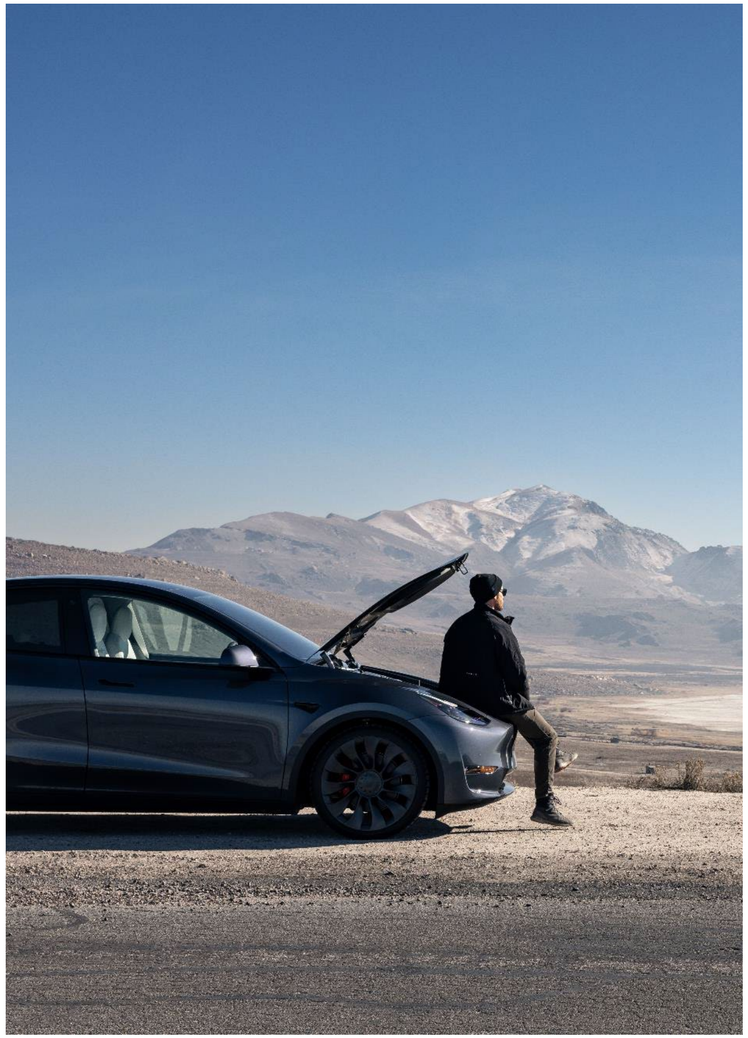
The carbon impact of ICE vehicles remains the same every year of use, but for EVs, it should improve every year

Based on publicly available sales and fleet data, we estimate that an average vehicle in the U.S. is driven slightly less than 12,000 miles per year for about 17 years before it is scrapped. Furthermore, as an ICE vehicle ages, its fuel efficiency only remains stable if serviced properly. On the other hand, electricity generation to charge EVs has become "greener" over time with the addition of cleaner energy sources to the grid. Below, we show zero-emission electricity generation capacity (including nuclear) in the U.S. since 2015. Even without factoring in any changes to federal policy or an acceleration of the adoption of renewables in the U.S. (which is likely), if current trends remain stable, emissions generated through EV charging should continue to decline over time.



[1]NEDC = New European Driving Cycle; WLPT = Worldwide Harmonized Light Vehicles Test Procedure; EPA = U.S. Environmental Protection Agency
[2]2021-2040 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.

Lifecycle Analysis of Tesla EVs vs. Equivalent ICE Vehicles



On the following pages, we will show the per mile lifecycle emissions of our vehicles

This includes 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. Below are the lifecycle emissions scenarios we show, and the assumptions used in each of the charts on the following pages:

Average Premium ICE: The reference ICE vehicle is 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.

Model 3/Y* Personal Use (Grid Charged): What emissions per mile could be if a Model 3/Y were principally charged at home from the grid.

Model 3/Y Ridesharing Use (Grid Charged): What emissions per mile could be if a Model 3/Y were used for ridesharing over one million miles using cell chemistry from Tesla energy products, charged from the grid.

Model 3/Y Personal Use (Solar Charged): What emissions per mile could be if a Model 3/Y were principally charged at home using a solar system and energy storage.

Model 3/Y Ridesharing Use (Solar Charged): What emissions per mile could be if a Model 3/Y were used for ridesharing over one million miles using cell chemistry from our energy products and if it were only charged using a solar system and energy storage.

Other assumptions:

- Charging a Model 3/Y using solar panels and a Powerwall adds emissions to the manufacturing phase while reducing use-phase emissions to as low as zero when 100% of charging is done using that system.

- We conservatively assume no additional renewable energy capacity on the grid during the life of the vehicle given the shape of the renewable energy adoption curve is still very much up for debate.

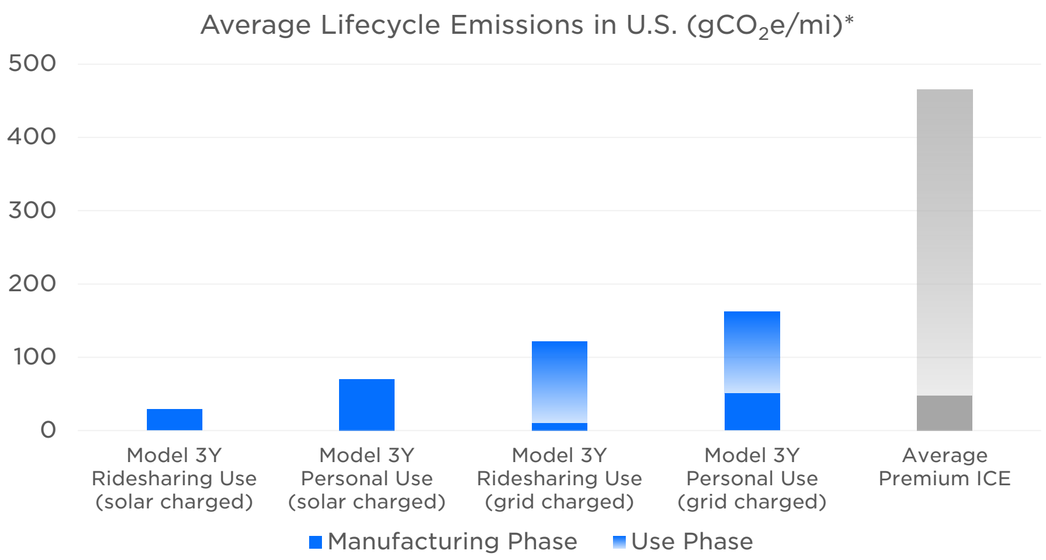
* This year we have added the impact of Model Y to the emissions per mile calculation in our LCA. Given that Model 3 and Model Y have 70%+ parts commonality and share many manufacturing processes their GHG footprints are very similar. We have decided to present the LCA as a weighted average of Model 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).

EV vs. ICE Vehicle Emissions per Mile
United States

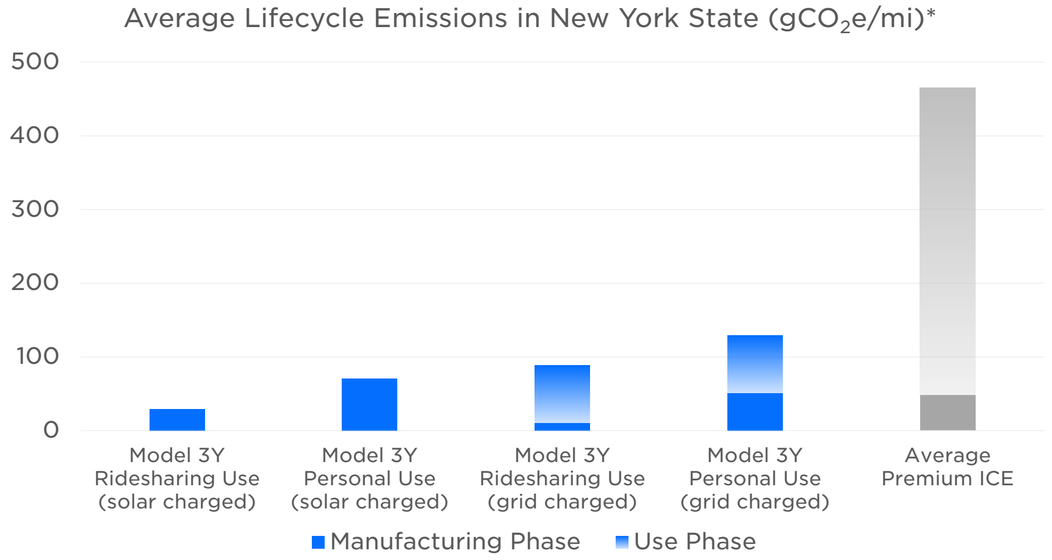
The electricity grid keeps getting cleaner, while emissions from ICE vehicles do not

To put this in perspective, average GHG emissions from charging one New York-based Tesla vehicle equates to the emissions from an ICE vehicle with a fuel economy of 109 MPG (no such vehicle is on the market). Even when charging a Tesla in Michigan, where approximately 60% of energy comes from natural gas and coal, the emissions from our vehicles still equates to the emissions from an ICE vehicle with 52 real-world MPG (considerably more in terms of EPA rated MPG). As more regions adopt sustainable energy solutions to generate power, emissions related to charging an EV from the grid will decrease even further.

EV customers can increase their renewable energy mix by installing solar panels or a Solar Roof and an energy storage solution, such as Powerwall, in their homes. This dramatically reduces the lifetime carbon footprint of an EV, even when accounting for the carbon footprint of both the solar panel/Solar Roof and Powerwall manufacturing and upstream supply chain.



Shift to greener grid



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

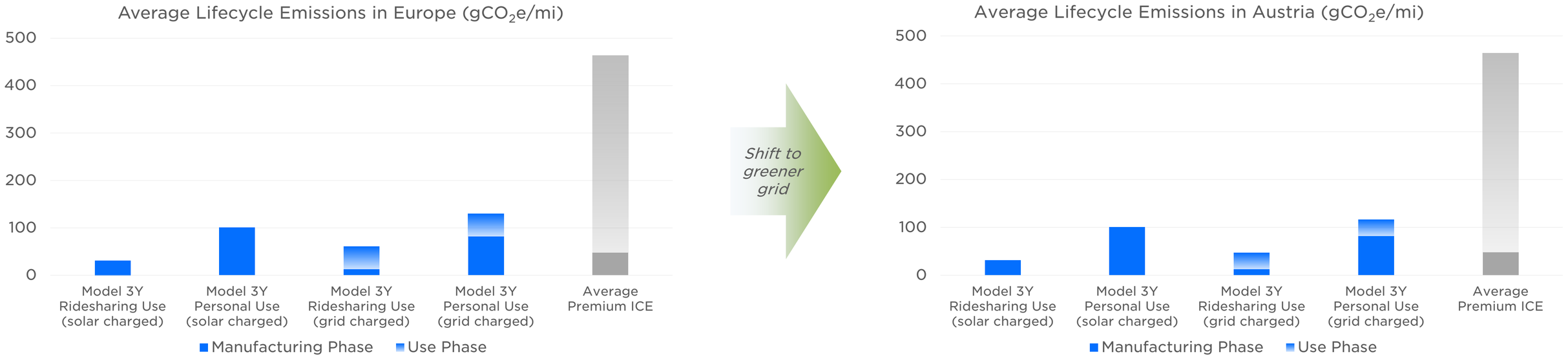
EV vs. ICE Vehicle Emissions per Mile
European Union, U.K. & EFTA

A cleaner grid in Europe means a bigger emissions gap between Model 3 and a comparable ICE vehicle

In Europe, the U.K. and EFTA (Iceland, Liechtenstein, Norway and Switzerland), larger portions of energy generation come from either renewable sources or nuclear, which means that in Europe the use-phase emissions gap between ICEs and EVs is even wider than it is in the U.S.

On the other hand, since an average European driver covers fewer miles per year than a U.S. driver, emissions from the manufacturing phase are divided by fewer miles. While in the U.S., an average vehicle covers 200,000 miles before getting scrapped, in Europe, total mileage is closer to 150,000 miles.

We used Austria as an example of how use-phase emissions should evolve once the European grid becomes greener. As seen in the chart on the right, in Austria, all-in lifecycle emissions of a personal, grid-charged Model 3Y are over 3.5x lower than all-in lifecycle emissions of an equivalent ICE vehicle.



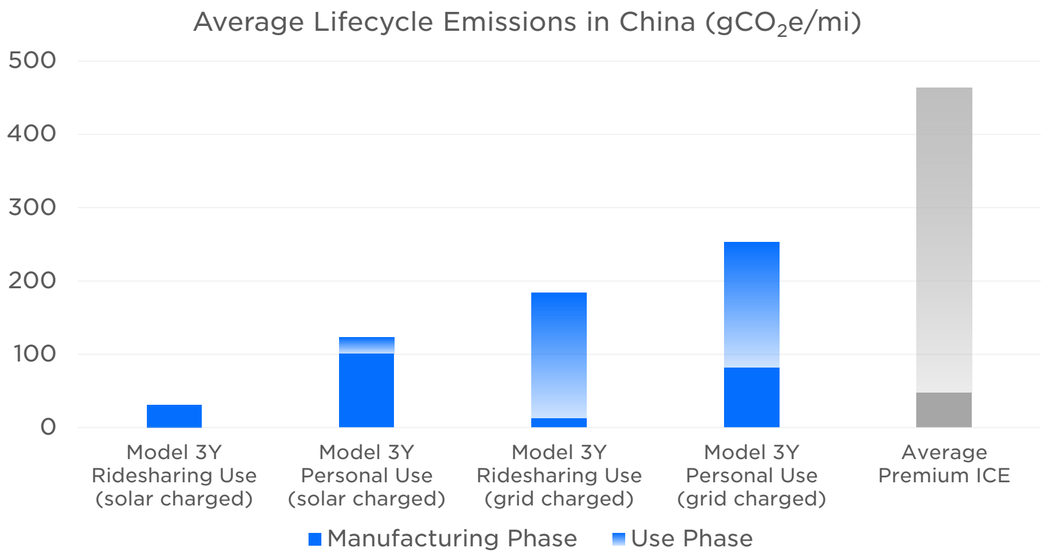
EV vs. ICE Vehicle Emissions per Mile
China

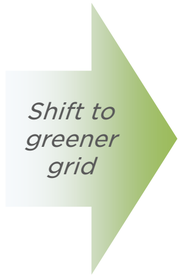
Despite a higher-emissions grid in China, Model 3 still has lower emissions than comparable ICE vehicles

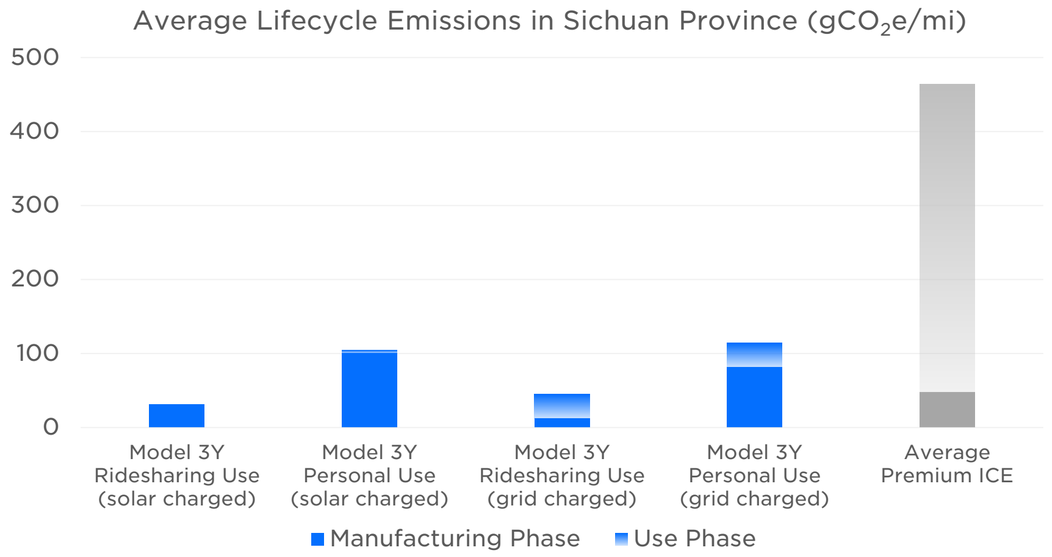
In China, much of the grid is powered by coal. That said, even in this scenario, charging a Tesla Model 3Y from the grid is still less emission intensive than running an ICE vehicle. Just like in Europe, we have assumed a vehicle lifetime of 150,000 miles.

We are expecting the grid mix in China to improve dramatically over time as China remains a dominant deployer and manufacturer of renewable energy. Sichuan Province (with a population of 81 million) is a great example of this. In this province, given the high percentage of renewable energy penetration, charging an EV from the grid is less polluting than charging an EV in most global countries or states.

In conclusion, even as of 2021, charging a Tesla Model 3Y in any of our major markets is more environmentally friendly than burning gasoline. Considering that vehicles are used for 17 to 20 years before getting scrapped, it is reasonable to assume that in the coming years, the gap in emissions per mile between EVs and ICEs will only get wider.







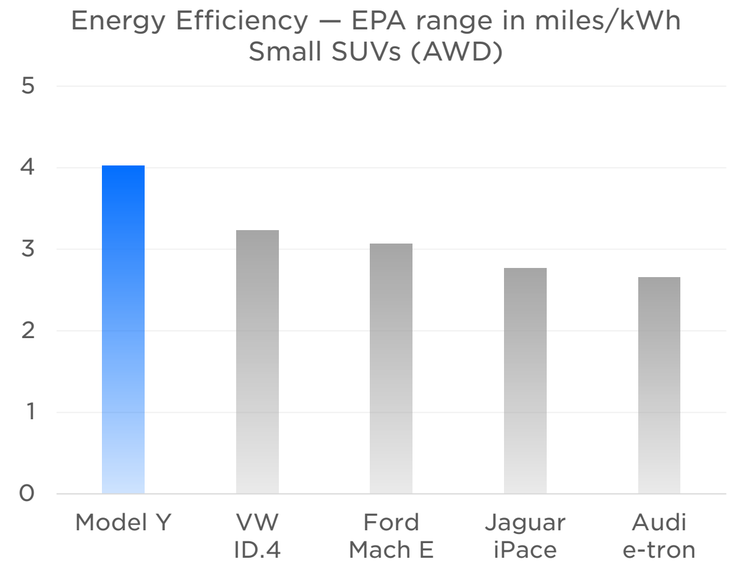
Reducing Carbon Footprint Even Further
Improving Powertrain Efficiency

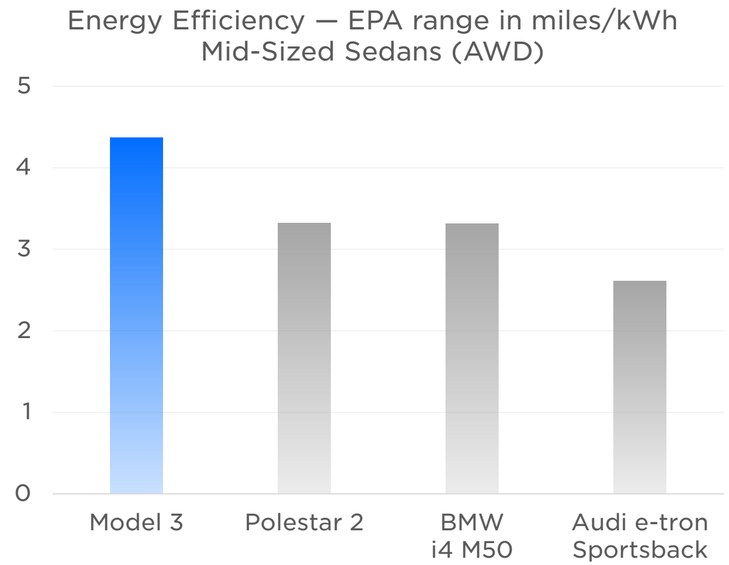
More efficiency than a Prius, performance of a Porsche

Tesla vehicles are among the most efficient EVs built to date. In the early days of Model S production, we were able to achieve energy efficiency of 3.1 EPA miles / kWh. Model Y All-Wheel Drive (AWD) achieves 4.1 EPA miles / kWh, which makes it the most efficient electric SUV produced to date. The gap between Tesla AWD vehicle efficiency continues to stand out compared to competitors in the same segment. While achieving the best-in-class energy efficiency, our AWD models can accelerate to 60 mph in just 4.2 seconds (4.8s for Model Y) and reach a top speed of 145 mph (135 mph for Model Y). In isolation, high energy efficiency is already difficult to achieve, but getting both performance and efficiency is the tricky part.

Tesla Robotaxis will be even more energy efficient

The energy efficiency of Tesla vehicles will continue to improve as we improve our technology and powertrain efficiency. It is also reasonable to assume that our high-mileage products, such as our future Tesla Robotaxis, will be designed for maximum energy efficiency as handling, acceleration and top speed become less relevant. This will minimize cost for our customers as well as reduce the carbon footprint per mile driven.





Source: OEM websites and other publicly available sources

Reducing Carbon Footprint Even Further

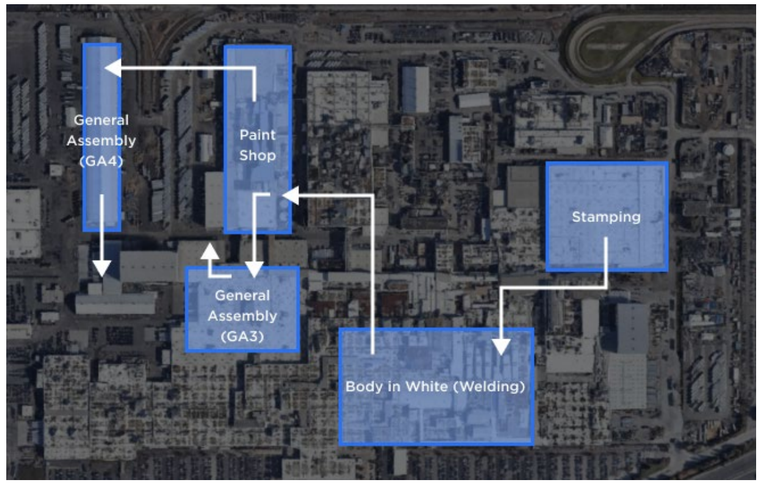
Tesla Manufacturing Footprint: Current Actions

1. Building new, better designed and more efficient factories

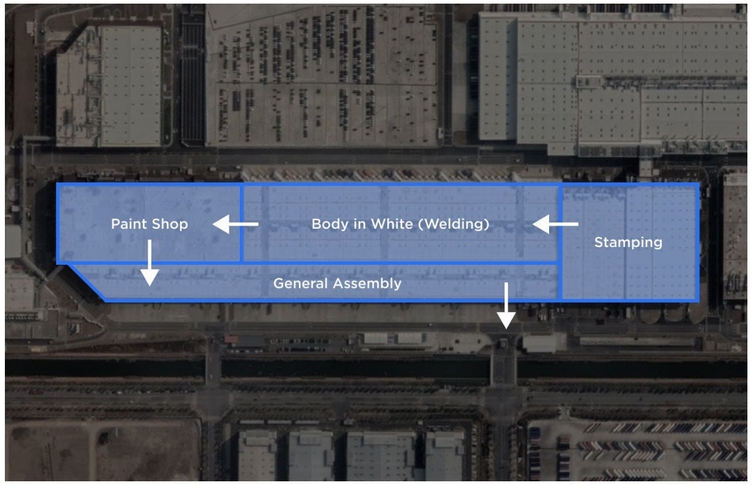
Building a factory from the ground up with sustainability in mind can have a material impact on reducing energy use. For each component that requires less movement around the factory, and as we use fewer robots in the vehicle production process, energy consumption declines.

In our quest for constant improvement, we build each new factory to be better and more sustainable than the previous one. 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.

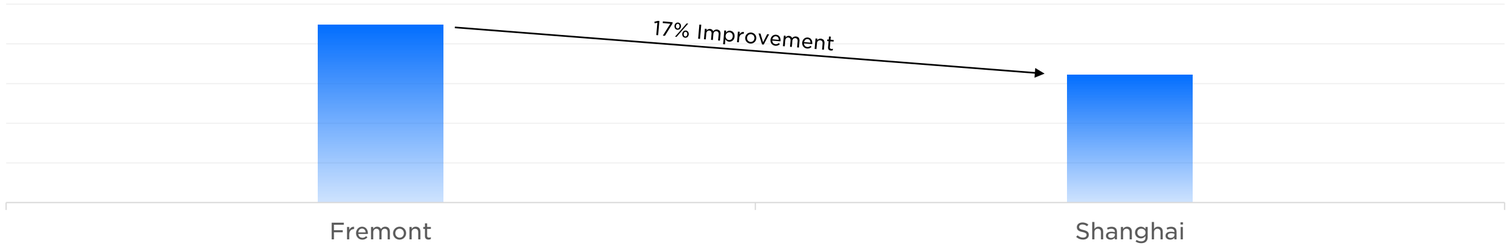
Model 3 in Fremont, CA



Model 3 in Gigafactory Shanghai



kWh of Energy per Vehicle Produced



Reducing Carbon Footprint Even Further

Tesla Manufacturing Footprint:
Current Actions

2. Covering roof space with solar panels

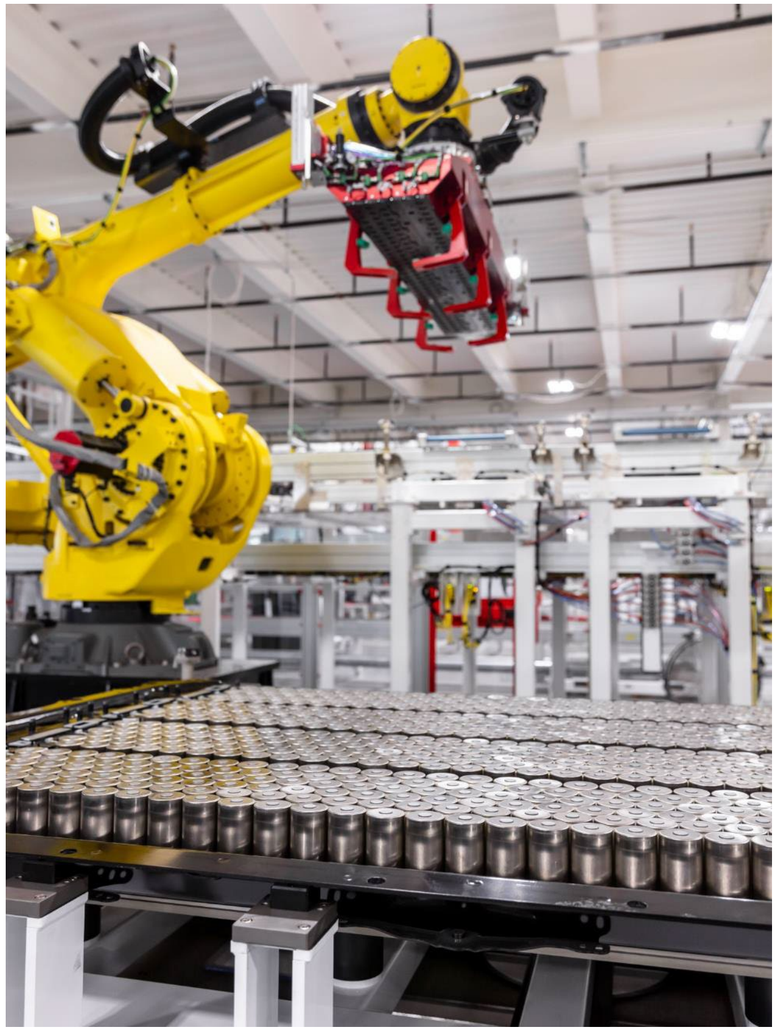
All our new factories are designed to be covered with solar panels. As of the end of 2021, we had installed solar panels with a capacity of 21,405 kW, with the vast majority installed on the roofs of Gigafactory Nevada, Gigafactory New York and our manufacturing facilities in California. We will continue to add more capacity to these and other facilities as space allows and as is economically feasible.

3. Leveraging AI to make our factories more efficient

We are leveraging six years of sensor data from Gigafactory Nevada to train an artificial intelligence (AI) program to safely control 195 interconnected HVAC units, accounting for 6MW of total electrical load. In its first full year of operation, we have measured significant load reduction compared to baseline usage. For such comparison, we look at actual energy usage for the HVAC system for the two modes under the same conditions (operations in the factory, time of year, external temperature, etc.). AI control is expected to achieve significant energy savings for Tesla as it is scaled up to control a majority share of HVAC equipment at Gigafactory Nevada as well as HVAC equipment at other Gigafactories.

Reducing Carbon Footprint Even Further

Tesla Manufacturing Footprint: Upcoming Plans



We will not be content until all our factories are carbon neutral, and there are other projects that we are working on to further reduce emissions. In order to reduce the cost of our vehicles and batteries, we also need to use less energy to produce them. Many of the projects created to achieve this goal were showcased at our Battery Day presentation in September 2020.

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

At Tesla's 2020 Battery Day, we presented a novel way that cells can be manufactured 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.

5. Utilizing renewable energy as much as possible throughout all our operations

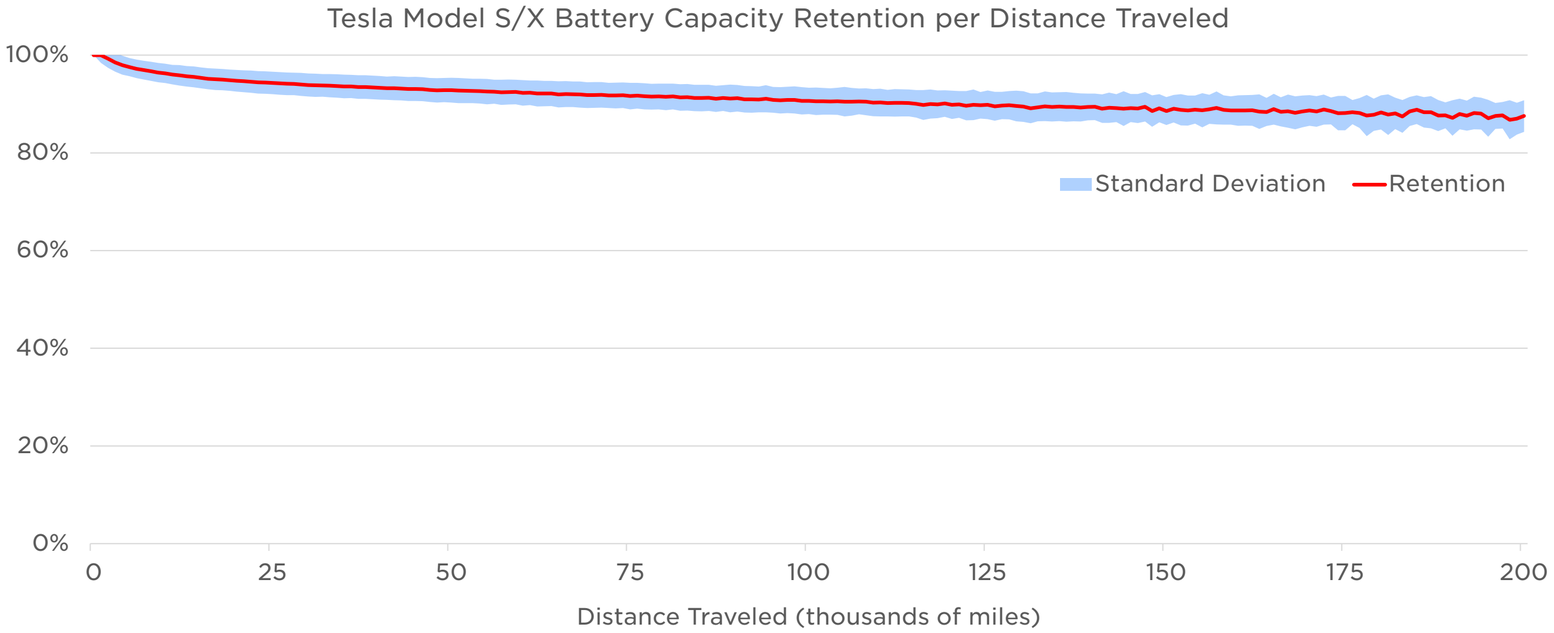
We plan to shift energy consumption toward renewables as quickly as possible throughout our operations, whether it is at our factories, sales, service or delivery locations or through our Supercharger network.

Reducing Carbon Footprint Even Further
Increasing Vehicle Utilization

Our batteries are designed to function for the entire life of the vehicle

Tesla's battery packs are designed to outlast the vehicle. 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. Creating a battery that could last for 1,000,000 miles (4,000 charging cycles) would dramatically reduce the emissions per mile driven for high-mileage vehicles such as taxis, delivery vans or trucks.

Producing Robotaxis is a core part of our mission. All vehicles in the world combined travel trillions of miles every year. A relatively small number of vehicles, such as taxis, delivery vans, trucks and buses account for a disproportionate amount of vehicle miles and, as a result, a disproportionate amount of emissions. A single future Tesla vehicle with a million-mile battery could be utilized over five-times more than an average vehicle in the U.S. After being fully optimized, and even once it is scrapped, a battery can still be recycled and its materials used in a brand-new battery.



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.

GHG Emissions
Scope 1, 2 and 3

We can make the biggest impact on GHG emissions by selling as many of our products as possible. Undoubtedly, the use-phase of our products avoids more lifetime emissions than either our operations or our supply chain could. However, in support of our mission, we track and try to minimize emissions that result from our full value chain, including our supply chain, manufacturing processes as well as our sales, service and delivery activities.

In 2021, we began measuring our Scope 1 and Scope 2 GHG emissions considering the principles and guidance of the GHG Protocol. We used the operational control approach methodology – accounting for GHG emissions from operations under our control. For detailed information on the scope of our calculations, please see page 139-142 of this report.

While our total Scope 1 and Scope 2 emissions may increase on an absolute basis in the near term as we continue to open new factories, our goal is to reduce the emissions intensity from production as we push the boundaries of sustainable manufacturing and improve the efficiency of our operations. As part of our commitment to reducing our overall emissions in the long term we signed up for the Science-Based Target Initiative (SBTi) in 2021.

Metric	Unit of Measure	Manufacturing	SSD[1]	Other[2]	TOTAL
Scope 1 GHG emissions	tCO_2e	124,000	31,000	30,000	185,000*
Scope 2 GHG emissions (location-based)	tCO_2e	342,000	35,000	26,000	403,000*
Scope 3 | Category 11: Use of Sold Products (EV charging)	tCO_2e				1,954,000

[1] SSD = Sales, Service & Delivery
[2] Other includes sites that conduct research & development, administration, energy product warehousing and deployment, and other mixed-used warehousing.
*PwC performed an attest review engagement on this metric. See their report on page 138.

Scope 3 GHG emissions calculations are highly academic, even those widely used and accepted like the GHG Protocol. Most companies lack primary data as it relates to their supply chain, product use and so on. Therefore, most Scope 3 GHG emissions reporting is done using lofty assumptions as well as estimates from databases – this can lead to figures that are magnitudes off from the actual impact. Tesla has begun to measure the two largest categories within our Scope 3 emissions: those from use of product and our supply chain.

Use of product emissions

Tesla has access to primary data from our over two million vehicles on the road and our fleet of solar and storage products — we can calculate our emissions at a much higher level of accuracy than most manufactures and can therefore develop emissions reduction solutions to match. This also means that we can calculate our use of product emissions year on year — we do not have to estimate emissions over the lifetime of the vehicle because we have primary data.

Supply chain emissions

Prioritizing our supply chain is crucial and we have a lot of work to do to incentivize suppliers to provide energy and emissions data for us to report on. We have already started to identify which materials and processes in our supply chain are key emitters so we can prioritize engagement and projects to address these emissions — see the Supply Chain section for more detail.

The good thing for us is that Tesla's high level of vertical integration and our direct sourcing relationships mean we are positioned to manage upstream emissions better than most.

100% Renewable Supercharger network

Efficiency of an ICE vehicle does not improve throughout its lifetime. EVs will get cleaner over their lifetime as the grid becomes greener. We will continue to look for ways to enable our customers to further reduce their emissions beyond our vehicles — through solar and storage products and software to help differentiate when the grid is greener and pulling more renewable energy like solar or wind.

The global Supercharger network was 100% renewable in 2021, achieved through a combination of onsite resources and annual renewable matching. Additionally, all home charging in California was 100% renewable through annual renewable matching. Therefore, the only emissions from the use of Tesla vehicles were a result of home charging outside of California and use of third-party charging networks.

NO_x, Particulates and Other Pollutants

Pollution from burning fossil fuels leads to eight million premature deaths globally each year

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. That is double the previous estimate of deaths from the negative effects of fine-particle pollution and would account for one-in-five premature deaths worldwide. This is a major advantage of EVs that is often forgotten about as the overall EV debate tends to focus on greenhouse gases. EVs are not just about the future of our planet, but very much about addressing preventable deaths today.

While air-quality is often categorized as a problem in developing countries, Nitrogen oxide (NO_x) and other PM2.5 particulates* cause significant issues in developed countries as well. In Europe alone, almost 800,000 people die prematurely every year due to pollution-related illnesses. EVs not only reduce the world's total carbon footprint, but also help to reduce city pollution.

Fine Particulate Air Pollution in Europe (2022)

Tesla Semi
Reducing Fleetwide Emissions

Tesla Semi is critical to our mission to accelerate the world's transition to sustainable energy. Right now, cell availability is the limiting factor for production – a Tesla Semi requires multiple times more cells than a passenger vehicle.

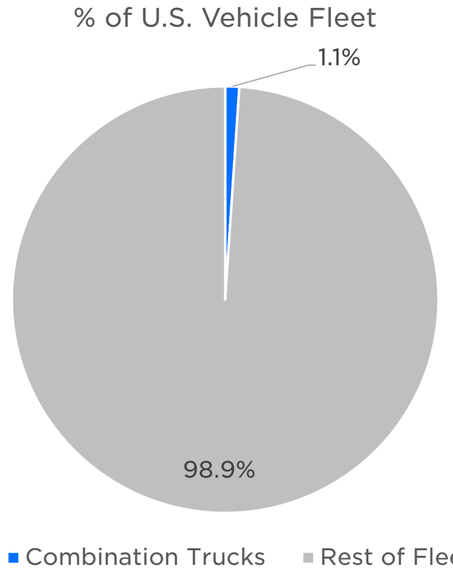
Semi offers an opportunity to have an outsized impact on GHG emissions from transport

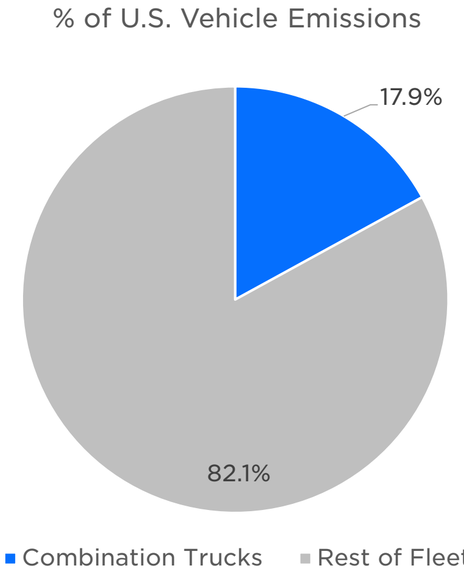
Combination trucks – of which the vast majority are semi trucks – in the U.S. account for just 1.1% of the total fleet of vehicles on the road. That said, because combination trucks have high fuel consumption due to their weight and heavy utilization, they account for approximately 18% of all U.S. vehicle emissions. Electrifying the heavy-duty truck segment is an essential part of transitioning the world to sustainable energy.

Payload equal to a diesel truck

With both the U.S. and E.U. having approved higher weight allowances for electric heavy-duty trucks, we expect the payload to be at least as high as it would be for a diesel truck. In the E.U., electric semi trucks are allowed to be 2 tons (~4,400 pounds) heavier than diesel equivalents, and in the U.S. the allowance is 0.9 tons (2,000 pounds). When fully loaded, the Tesla Semi should be able to achieve over 500 miles of range, achieved through aerodynamics and highly efficient motors. This truck will be able to reach an efficiency of over 0.5 miles per kWh.

While most heavy trucking journeys are shorter than 500 miles, we want long-distance hauling to also be sustainable. We are in the process of developing a Semi charger network at trucking rest stops across the U.S. and Europe, where each Tesla Semi could top up their range.





Waste Generated Per Vehicle Manufactured

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

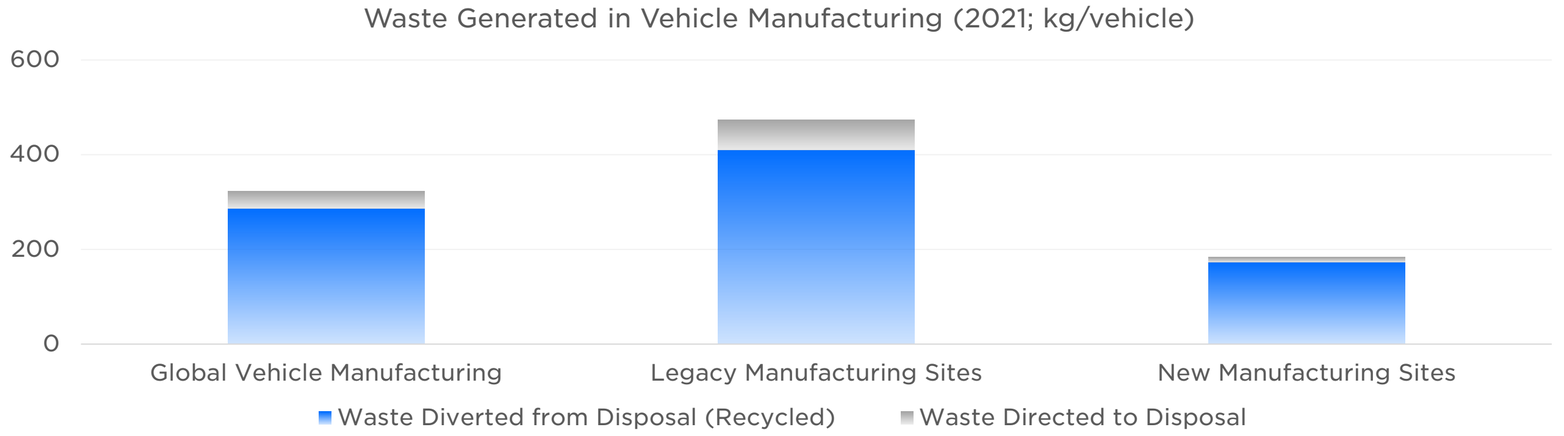
Building localized factories both makes sense economically and reduces waste. First, because the automotive supply chain doesn't have a strong presence on the West Coast of the U.S., many components need to be shipped from long distances, requiring excessive packaging and creating more waste than necessary.

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. Less material flow results in less waste, because a shorter journey requires less protective packaging. The chart below 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.

Any materials that are possible to recycle, we recycle

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 2021 was not recyclable.

We push for innovative approaches to reducing waste, which includes reduction of non-recyclable materials in the first place, learning from local factories and deploying improvements globally or working with our logistics team to minimize shipments and packaging per vehicle.



- Global Vehicle Manufacturing = all major factories dedicated to vehicle manufacturing, including the Fremont Factory and supporting facilities, Gigafactory Nevada and Gigafactory Shanghai.
- Legacy Manufacturing Sites = Gigafactory Nevada, Fremont Factory and supporting facilities.
- New Manufacturing Sites = Gigafactory Shanghai.