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.

01

Master Plan Part 3

A MESSAGE OF HOPE

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 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

30 TW
Renewable power

1/2
The energy required

10%
2022 world GDP

Zero
Insurmountable resource challenges

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

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)

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

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

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

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.

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

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

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

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.

Total Cost of Ownership
5 years, 60,000 miles

*Based on 2023 Model Base Trims

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.

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.

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.

Exceeding safety standards across four continents

	NHTSA	IIHS HLDI	EURO NCAP	ANCAP SAFETY	CIASI 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 SAFETY	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%
WEY Coffee 01	94%
ORA Funky Cat	93%
Nissan Ariya	93%
WEY Coffee 02	93%
BMW 2 Series AT	92%
BMW X1	92%
Lexus NX	91%
Subaru Solterra	91%
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.

Real-World Crashes

Measured by Impact

Tesla Energy is a one-stop shop.

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.

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.

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

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.

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.

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 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.

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

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

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

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

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

Tons CO_2e per vehicle

Vehicle Supply Chain · Battery Supply Chain · Use Phase

Source: OEM Sustainability Disclosures

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

Tesla Battery

For our cathodes, Tesla is currently pursuing a diversified roadmap

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.

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 69%	Primary Extraction 17%
Upgrading 10%	Transportation 5%

Nickel

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

Cobalt

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