Tesla Investment Thesis: Deep Dive

Feb 2021, @remouherek

Goals

- Big picture overview
- Detailed investment thesis
- Long-term valuation
- Risks

The boring stuff (disclaimer)

- This is not financial advice, and is for informational purposes only
- I am a long-term Tesla shareholder (since 2017) and I‘m currently up ~15x
- Always do your own research before making financial decisions

Executive Summary

Big Picture

A perfect storm is disrupting the auto industry

- The world needs to transition to sustainable energy
- We need to fix air pollution
- 100% of vehicle production is going battery electric (BEV)
- Old auto is ripe for disruption
- Tesla started the smart car revolution
- The autonomy era is coming

Thesis Summary

Tesla is a generational company (similar to Amazon or Apple)

- Tesla is a mission first company
- World-class execution
- Extreme ambition
- Always one step ahead
- Actively solving the limiting factor: battery supply
- Superior technology & product
- Apple-like margins, Amazon-like market size
- Attract best talent
- Owner-operator with 21% stake in the company

Valuation Summary

- Revenue (2030): $895 billion
- Gross Profit 35%: $313 billion
- Net Profit 15%: $134 billion

- 3x Revenue = $2.7 trillion
- 6x Revenue = $5.4 trillion

- **2.7x to 6.7x Upside in 10 Years**
- **10% to 21% compounded per year (CAGR)**

Risk Summary

- Key person risk
  - Elon leaving / dying
- Execution risks
  - Not achieving vision
  - Bad execution
- Operational risks
  - Bugs, hacks, sabotage
- Regulatory risks
  - No approval for Full Self Driving
  - Regulation / break-up

Big Picture

Fossil fuels are finite

- Even ignoring pollution and climate change, we are running out of fossil fuels
- We can‘t keep burning fossil fuels at the current rate
- **We need to transition the world to sustainable energy**

Air Pollution

- Air pollution kills an estimated 7 million people worldwide every year (WHO)
- 91% of world‘s population breathes air that exceeds WHO guideline limits containing high levels of pollutants, with low- and middle-income countries suffering from the highest exposures
- **We need to fix air pollution**

Source: https://www.who.int/health-topics/air-pollution

Air Pollution / New Dehli

India’s capital New Delhi suffers most toxic air in a year

New Delhi – home to 20 million people – recorded the concentration of poisonous PM2.5 particles at 14 times the safe limit.

Source: https://www.aljazeera.com/news/2020/11/5/indias-capital-new-delhi-suffers-most-toxic-air-in-a-year

Delhi air pollution: Power ministry seeks new deadline for coal-fired plants to install emission equipment

If the proposal is accepted, it would pose a further challenge to authorities in India's capital New Delhi grappling with pollution that can cause lung disease and blights air quality

Reuters | January 10, 2020 | Updated 15:01 IST

Representative image

Source: https://www.businesstoday.in/current/economy-politics/delhi-air-pollution-power-ministry-seeks-new-deadline-for-coal-fired-plants-to-install-emission-equipment/story/393550.html

Air Pollution / Documentary

- I highly recommend this documentary
- Race For Clean Air: https://youtu.be/mNZIdHhdQs8

100% of auto production = Electric

- About 100M automobiles are being produced every year
  - 75M passenger cars
  - 25M trucks, buses, commercial vehicles

- Hybrids and Plug-in Hybrids will eventually be replaced by BEVs

- **The end state is 100% battery-electric vehicles (BEVs)**

GM to go all-electric by 2035, phase out gas and diesel engines

GM launched its first long-range electric car, the Chevy Bolt, in 2016.

Source: https://www.nbcnews.com/business/autos/gm-go-all-electric-2035-phase-out-gas-diesel-engines-n1256055

Fossil fuel-based vehicle bans across the world

By Reuters Staff

3 MIN READ

(Reuters) - Britain will ban the sale of new petrol and diesel cars and vans from 2030, five years earlier than previously planned, as part of what Prime Minister Boris Johnson is casting as a "green revolution" to cut emissions to net zero by 2050.

Source: https://www.reuters.com/article/climate-change-britain-factbox/fossil-fuel-based-vehicle-bans-across-the-world-idINKBN27Y19F

United States:

California will ban the sale of new gasoline-powered passenger cars and trucks starting in 2035, Governor Gavin Newsom said in September.

Canada:

The Canadian province of Quebec said this week it would ban the sale of new gasoline-powered passenger cars from 2035.

European Union:

EU environment ministers struck a deal on Oct 23 to make the bloc's 2050 net zero emissions target legally binding, but left a decision on a 2030 emissions-cutting target for leaders to discuss in December.

Germany:

German cities started to introduce bans on older diesel vehicles that emit higher amounts of pollutants than from late 2018. (reut.rs/38UFw6L)

Source: https://www.reuters.com/article/climate-change-britain-factbox/fossil-fuel-based-vehicle-bans-across-the-world-idINKBN27Y19F

Norway:

Norway, which relies heavily on oil and gas revenues, aims to become the world's first country to end the sale of fossil fuel-powered cars, setting a 2025 deadline. Fully electric vehicles now make up about 60% of monthly sales in Norway.

China:

In 2017 China begun studying when to ban the production and sale of cars using traditional fuels but did not specify when it might be introduced.

Sales of new energy vehicles (NEV) will make up 50% of overall new car sales in China, the world's biggest auto market, by 2035, an industry official said last month.

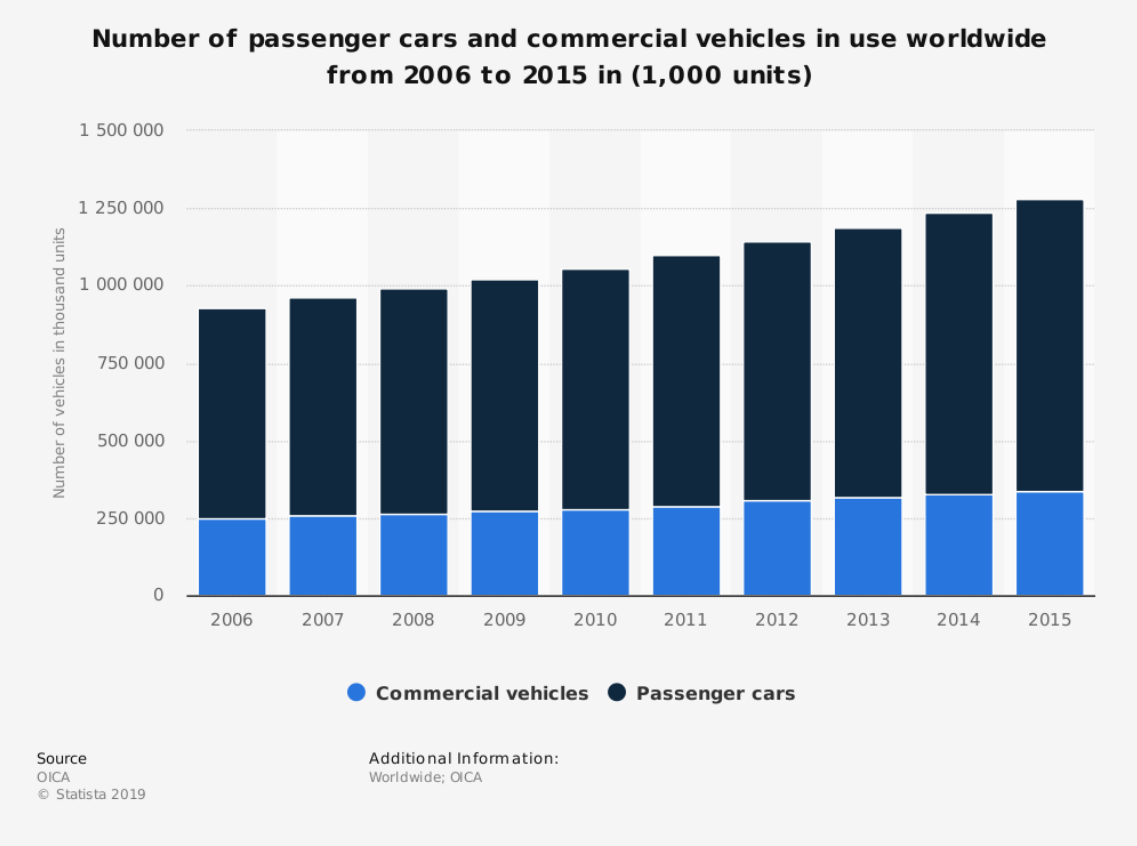
India:

Last year, India's central think-tank asked scooter and motorbike manufacturers to draw up a plan to switch to electric vehicles. The think-tank also recommended that only electric models of scooters and motorbikes with engine capacity of more than 150cc must be sold from 2025, sources told Reuters. (reut.rs/2KaSyCS)

Source: https://www.reuters.com/article/climate-change-britain-factbox/fossil-fuel-based-vehicle-bans-across-the-world-idINKBN27Y19F

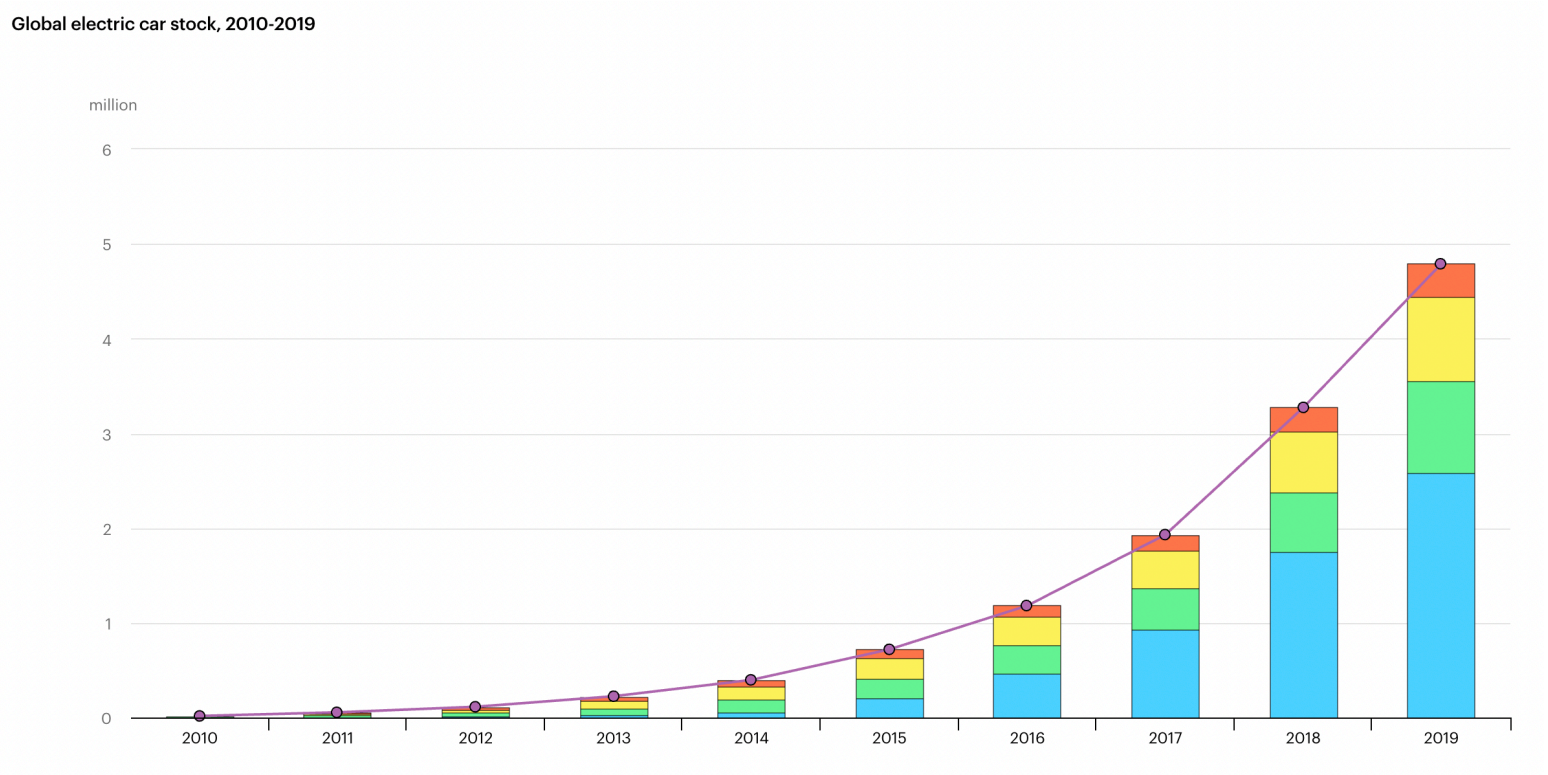
Global auto fleet

- About 1.5 billion vehicles in 2021



Global BEV fleet

- About 6.3M BEVs in 2020

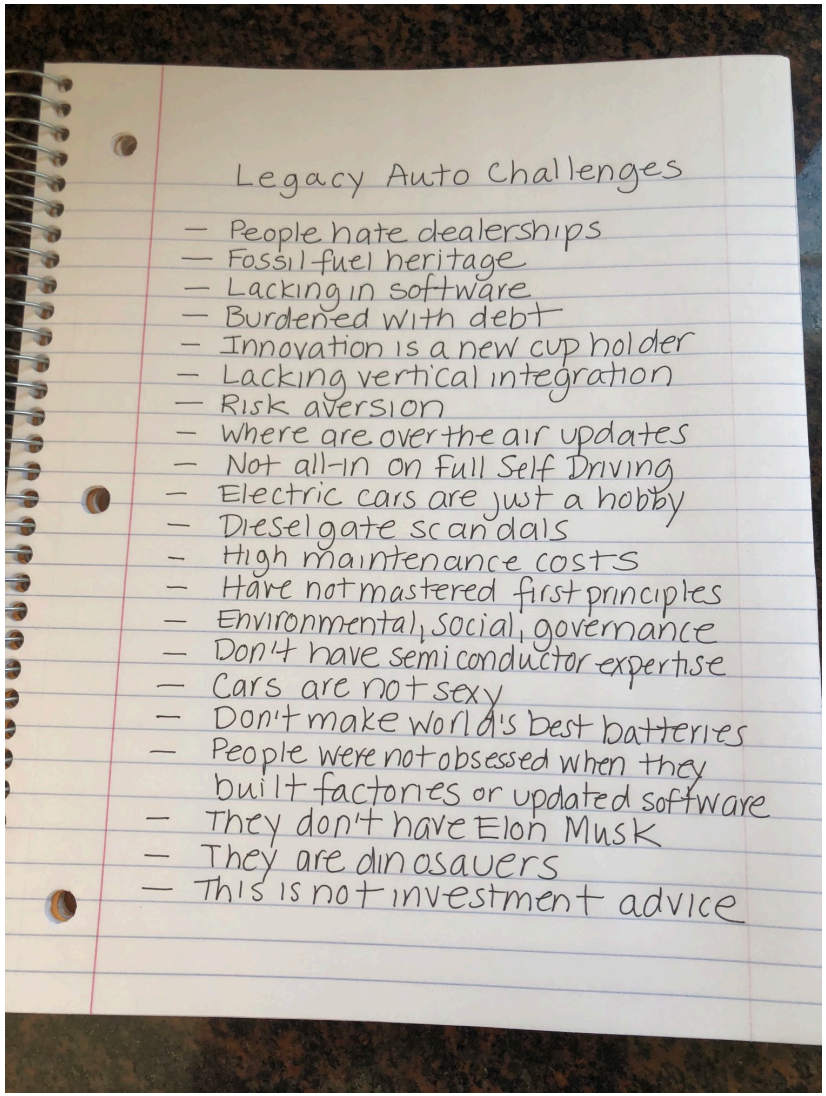


Source: https://www.iea.org/reports/global-ev-outlook-2020

BEV market share

- In 2020, BEV production was 2.5M (estimate)
- About 6.3M BEVs in 2020 (total)
- 6.3/1500 = 0.4% of global BEV auto fleet
- **We need 250x the current number of BEVs**

Auto industry ripe for disruption



Source: https://twitter.com/hikingskiing/status/1361974674872279040

@remouherek

Auto industry ripe for disruption

- Who enjoys dealerships?
- Who enjoys spending hours buying a car?
- Who enjoys buying options for basic things such as A/C or navigation?
- Who enjoys to go to the dealer for software updates?
- Who wants to support companies that intentionally lied and deceived the public? (diesel scandal)
- Who enjoys preserving the status quo, instead of envisioning the future? (software, BEV, autonomy)

- **The auto industry is ripe for major disruption**

Smart Cars: The iPhone Moment

- Tesla was the iPhone moment of the auto industry
- From dumb car to laptop on wheels
- Paradigm shifts
  - from analog to digital
  - from hardware to software
  - from hardware first to software first

- **Tesla started the smart car revolution**

The Autonomy Era

- Vehicles will become fully autonomous (Level 5)
- Car accidents: 1M deaths + 10M serious injuries per year
- Autonomous vehicles will become >10x safer than humans
- The business model will change:
  - From selling cars -> Mobility-as-a-Service
  - From operating single cars -> Fleet operation

- **A new era is coming**

Summary: Big Picture

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Tesla Investment Thesis

Mission First

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

Volkswagen


Our new vision
Excited customers
Excellent employer
Sustainable growth
Competitive profitability
Role model for environment, safety and integrity
Shaping mobility –
for generations to come.

Toyota

Toyota will lead the future mobility society, enriching lives around the world with the safest and most responsible ways of moving people.

Through our commitment to quality, ceaseless innovation, and respect for the planet, we strive to exceed expectations and be rewarded with a smile.

We will meet challenging goals by engaging the talent and passion of people who believe there is always a better way.

General Motors

Our goal is to deliver world-class customer experiences at every touchpoint and do so on a foundation of trust and transparency.

WHY WE'RE HERE

Our Vision is a World With Zero Crashes, Zero Emissions and Zero Congestion

Our diverse team of 164,000 employees brings their collective passion for engineering, technology and design to deliver on this ambitious future. And the bold commitments we've made are moving us closer to realizing this vision.

Renault

"A BIG COMPANY CANNOT FOCUS ONLY ON ITS ECONOMIC PERFORMANCE, WITHOUT TAKING HEED OF WHAT IS GOING ON IN SOCIETY."

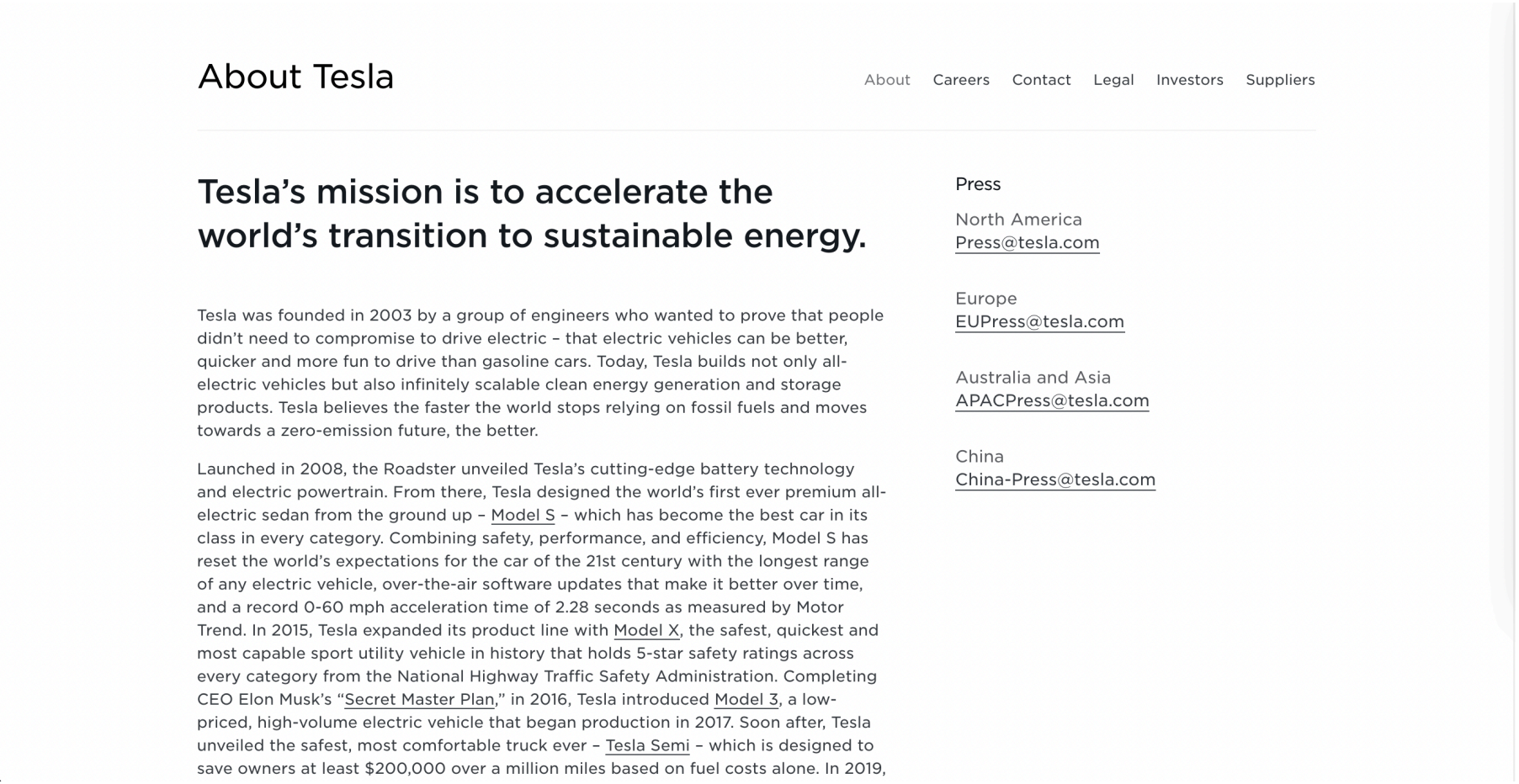
"We see our social, societal and environmental responsibility (…) as a practical commitment to the common good." - Carlos Ghosn – CHAIRMAN AND CEO RENAULT

GROUPE RENAULT HAS A GLOBAL STRATEGY

Groupe Renault has a global strategy with respect to corporate responsibility that ensures a responsible management of its activities on all markets where it is present.

The main objectives of our CSR strategy are: the reduction of the negative impact on the environment during the products' lifecycle and preservation of natural resources, the development of employees and of communities, especially through educational projects and investments in culture; the health of car users, pedestrians and employees, the respect of the equal opportunities principle and a continuously increasing diversity (of gender, religion, ethnicity or social groups). These objectives indicate our capacity of opening to the world and meeting society's expectations.

Tesla



About Tesla

About Careers Contact Legal Investors Suppliers

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

Tesla was founded in 2003 by a group of engineers who wanted to prove that people didn't need to compromise to drive electric – that electric vehicles can be better, quicker and more fun to drive than gasoline cars. Today, Tesla builds not only all-electric vehicles but also infinitely scalable clean energy generation and storage products. Tesla believes the faster the world stops relying on fossil fuels and moves towards a zero-emission future, the better.

Launched in 2008, the Roadster unveiled Tesla's cutting-edge battery technology and electric powertrain. From there, Tesla designed the world's first ever premium all-electric sedan from the ground up – Model S – which has become the best car in its class in every category. Combining safety, performance, and efficiency, Model S has reset the world's expectations for the car of the 21st century with the longest range of any electric vehicle, over-the-air software updates that make it better over time, and a record 0-60 mph acceleration time of 2.28 seconds as measured by Motor Trend. In 2015, Tesla expanded its product line with Model X, the safest, quickest and most capable sport utility vehicle in history that holds 5-star safety ratings across every category from the National Highway Traffic Safety Administration. Completing CEO Elon Musk's "Secret Master Plan," in 2016, Tesla introduced Model 3, a low-priced, high-volume electric vehicle that began production in 2017. Soon after, Tesla unveiled the safest, most comfortable truck ever – Tesla Semi – which is designed to save owners at least $200,000 over a million miles based on fuel costs alone. In 2019,

Press

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APACPress@tesla.com

China
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World-Class Execution

Master Plan — Part 1 (2006)

- Build sports car
- Use that money to build an affordable car
- Use *that* money to build an even more affordable car
- While doing above, also provide zero emission electric power generation options

Source: https://www.tesla.com/blog/secret-tesla-motors-master-plan-just-between-you-and-me

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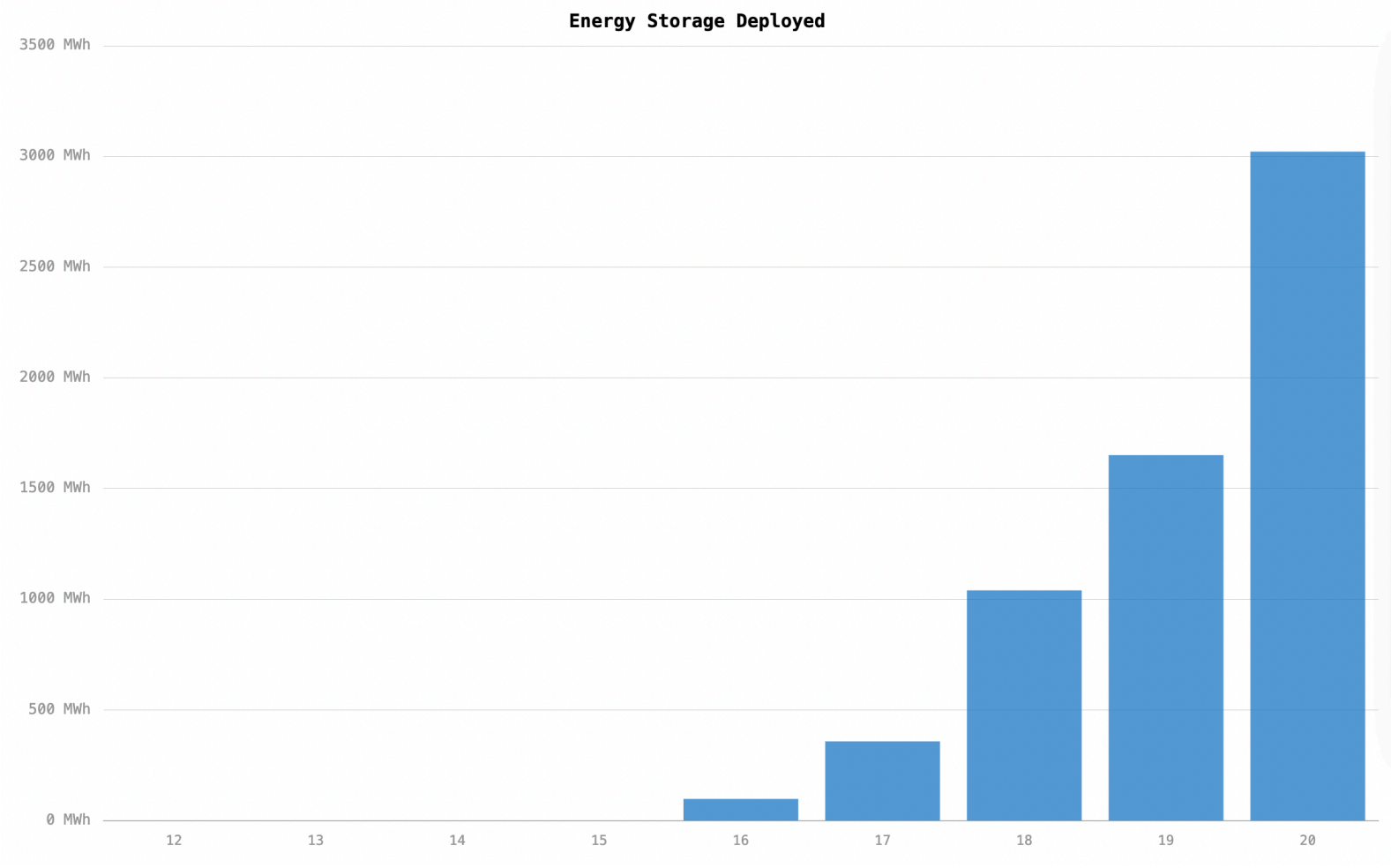
- Use that money to build an affordable car
  - ✅ Tesla Model S (2012-today): 268k vehicles delivered (until 2020)
  - ✅ Tesla Model X (2015-today): 182k vehicles delivered (until 2020)

Master Plan — Part 1 (2006)

- Build sports car
  - ✅ Tesla Roadster (2008-2012): 2,450 vehicles delivered
- Use that money to build an affordable car
  - ✅ Tesla Model S (2012-today): 268k vehicles delivered (until 2020)
  - ✅ Tesla Model X (2015-today): 182k vehicles delivered (until 2020)
- Use *that* money to build an even more affordable car
  - ✅ Tesla Model 3 (2017-today): 798k vehicles delivered (until 2020)

Master Plan — Part 1 (2006)

- While doing above, also provide zero emission electric power generation options
  - ✅ Energy generation: 17 TWh of solar generation (until 2020)
  - ✅ Energy storage: 6.2 GWh of storage deployed (until 2020)



Source: https://hypercharts.co/tsla?frequency=annual

Master Plan — Part 2 (2016)

- Create stunning solar roofs with seamlessly integrated battery storage
- Expand the electric vehicle product line to address all major segments
- Develop a self-driving capability that is 10X safer than manual via massive fleet learning
- Enable your car to make money for you when you aren't using it

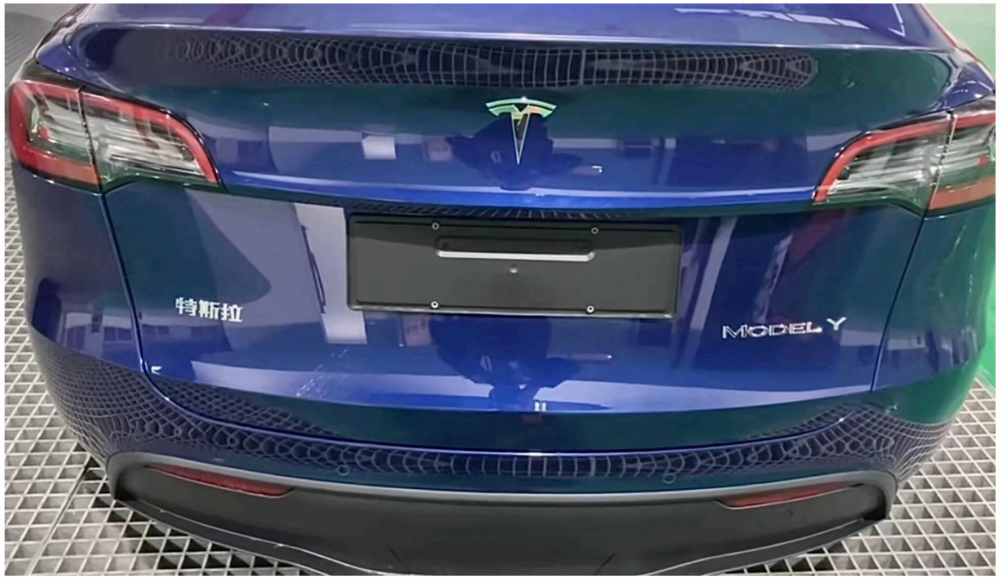
Source: https://www.tesla.com/blog/master-plan-part-deux

1) Solar roof + storage

2) Product line: Model Y

Rumor: Tesla China-Made Model Y Surpassed 100K Orders within 10hrs of New Pricing

by Vincent Y • January 01, 2021



2) Product line: Cybertruck

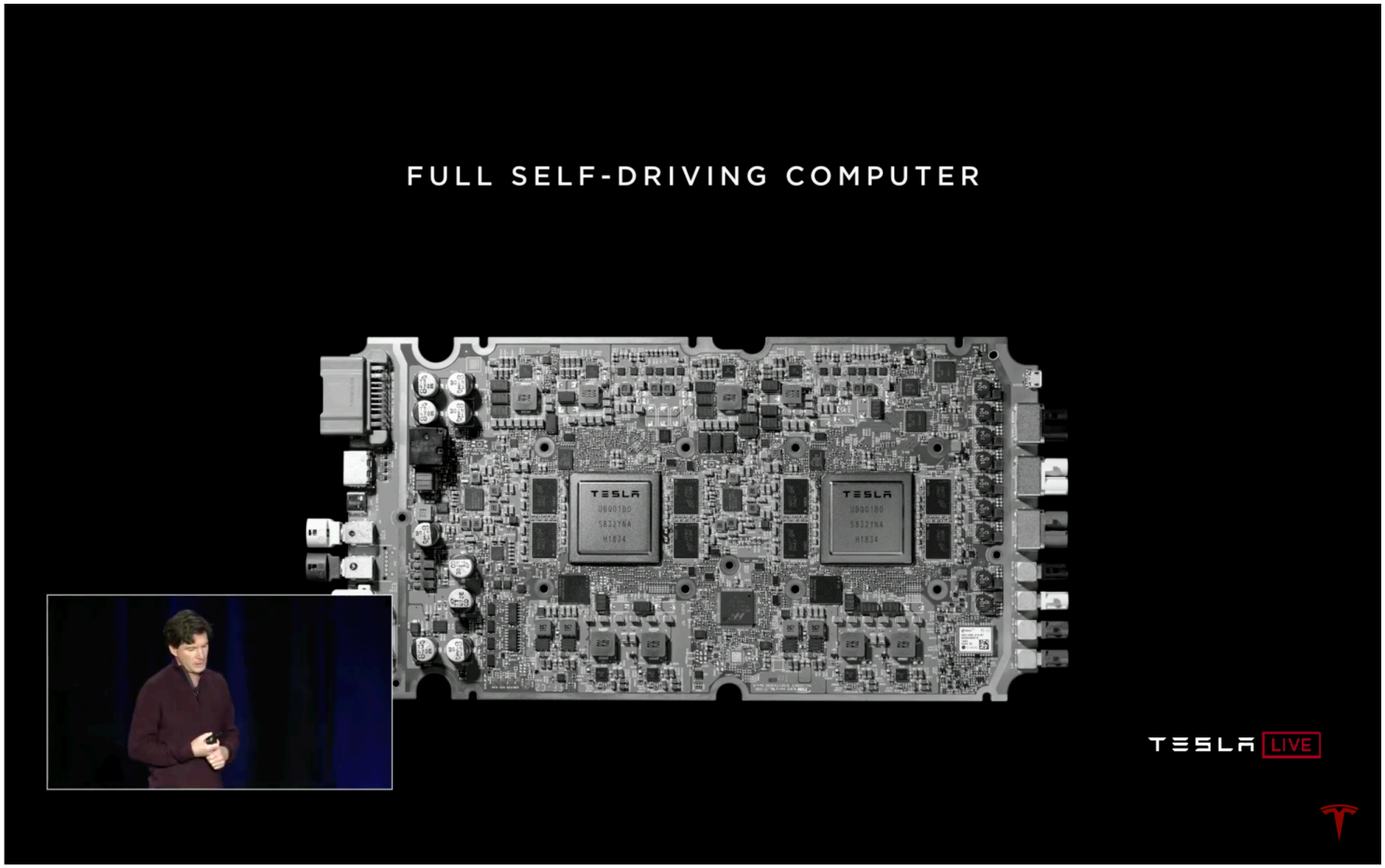
2) Product line: Semi

2) Product line: $25,000 car

2) Product line: Van

2) Product line: Public transport (?)

3) Self-driving (10x safer)



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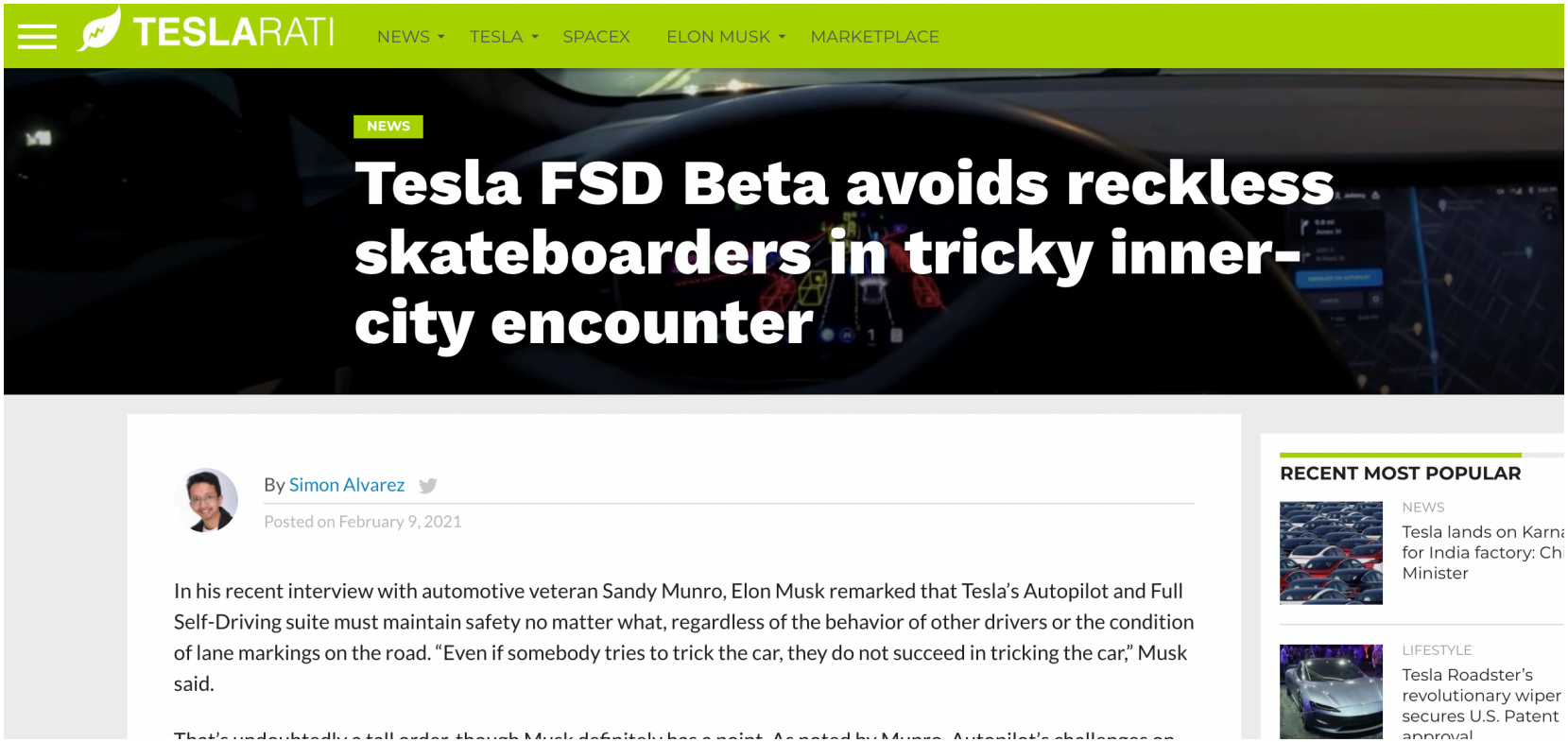
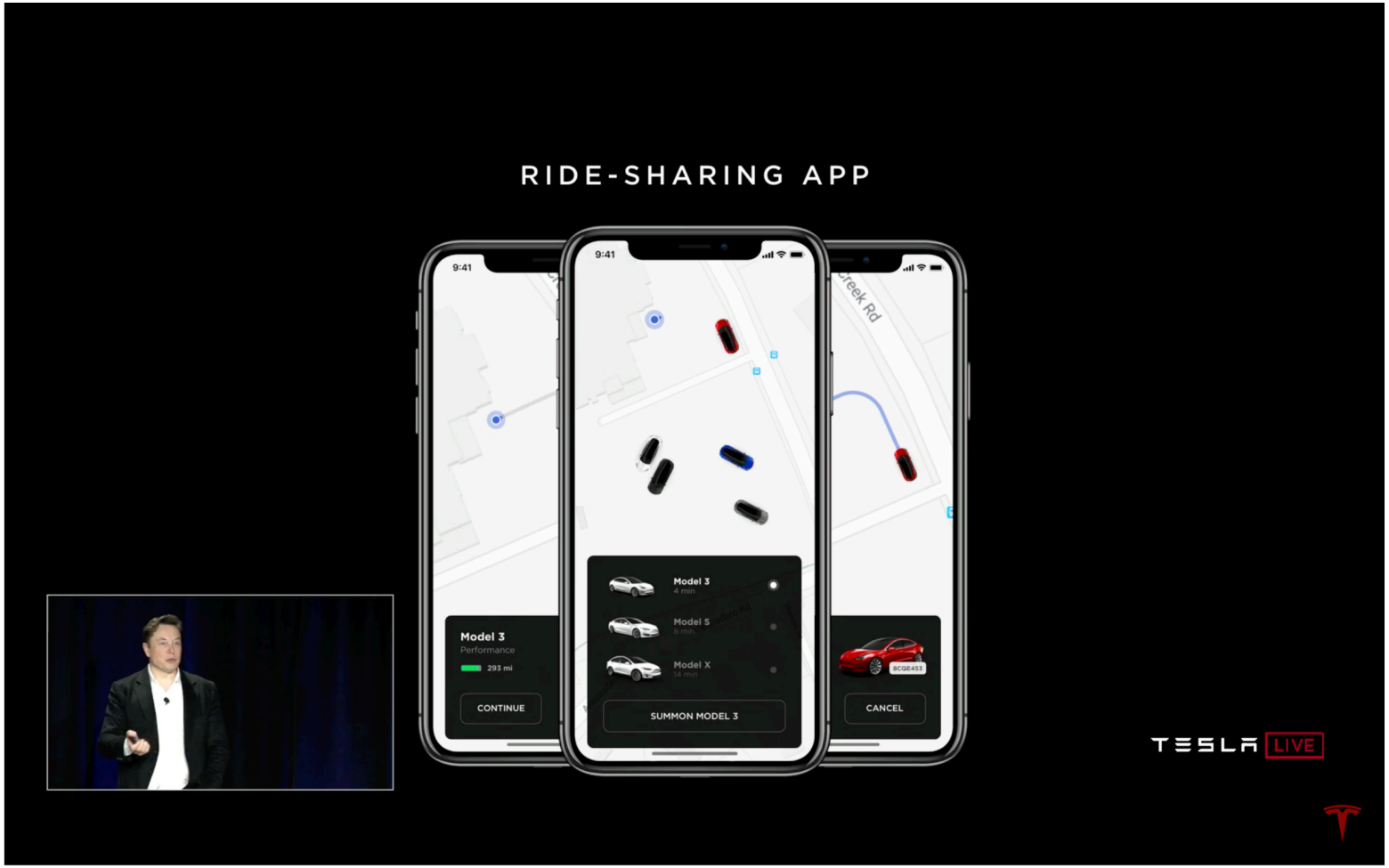


3) Self-driving (10x safer)

Tesla plans to offer machine-learning training as web service with its new 'Dojo' supercomputer

Fred Lambert - Sep. 21st 2020 6:13 am ET @FredericLambert

4) Make money with Robotaxis



4) Make money with Robotaxis

Extreme ambition

„We want to make 20 million vehicles per year. There will be 2 billion cars & trucks on the road, and we‘re not moving the needle if we‘re not replacing at least 1% of the world‘s fleet per year.“ — Elon Musk (https://www.youtube.com/watch?v=z75nXURvExQ&t=1697s)

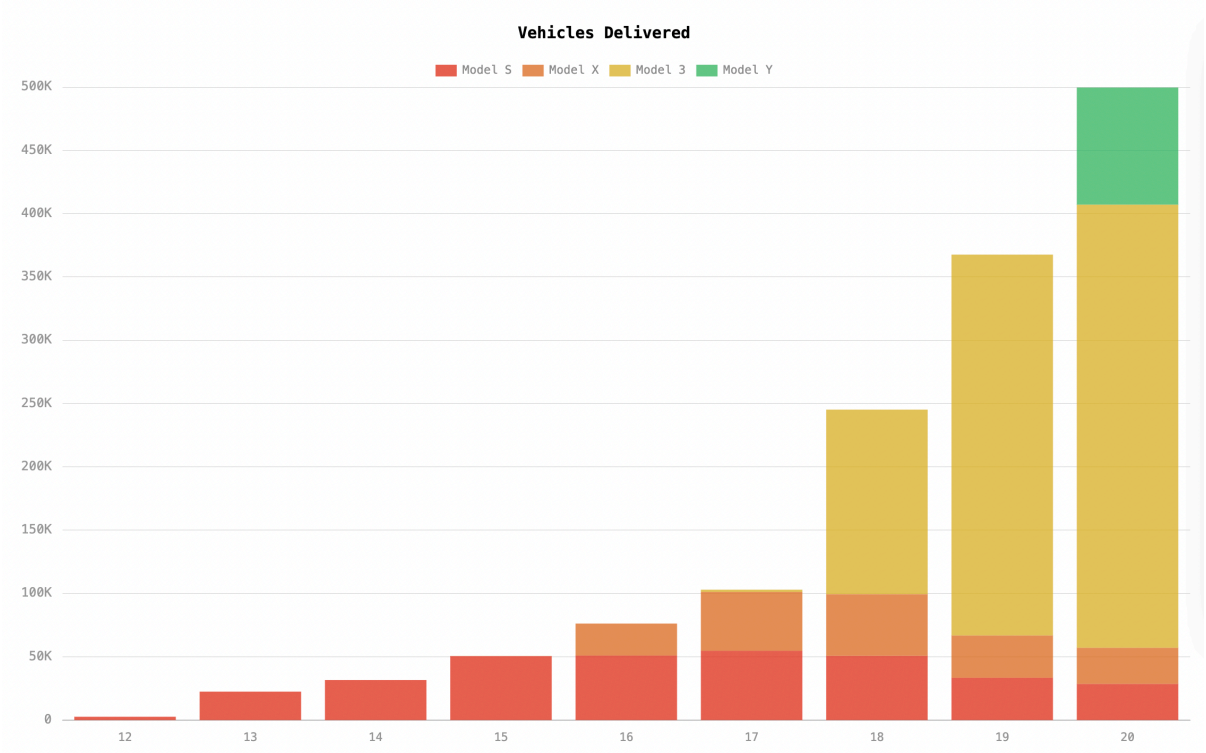
„We do think that we can maintain a growth rate in excess of 50% per year for many years to come.“— Elon Musk, Q4 2020 Earnings Call

„1 million people die per year in car accidents, and 10 million get seriously injured. We need to [get FSD done].“— Elon Musk

(https://www.youtube.com/watch?v=TAj_ydMUpK0&t=1910s)

Extreme ambition: Results so far

Extreme ambition: Results so far



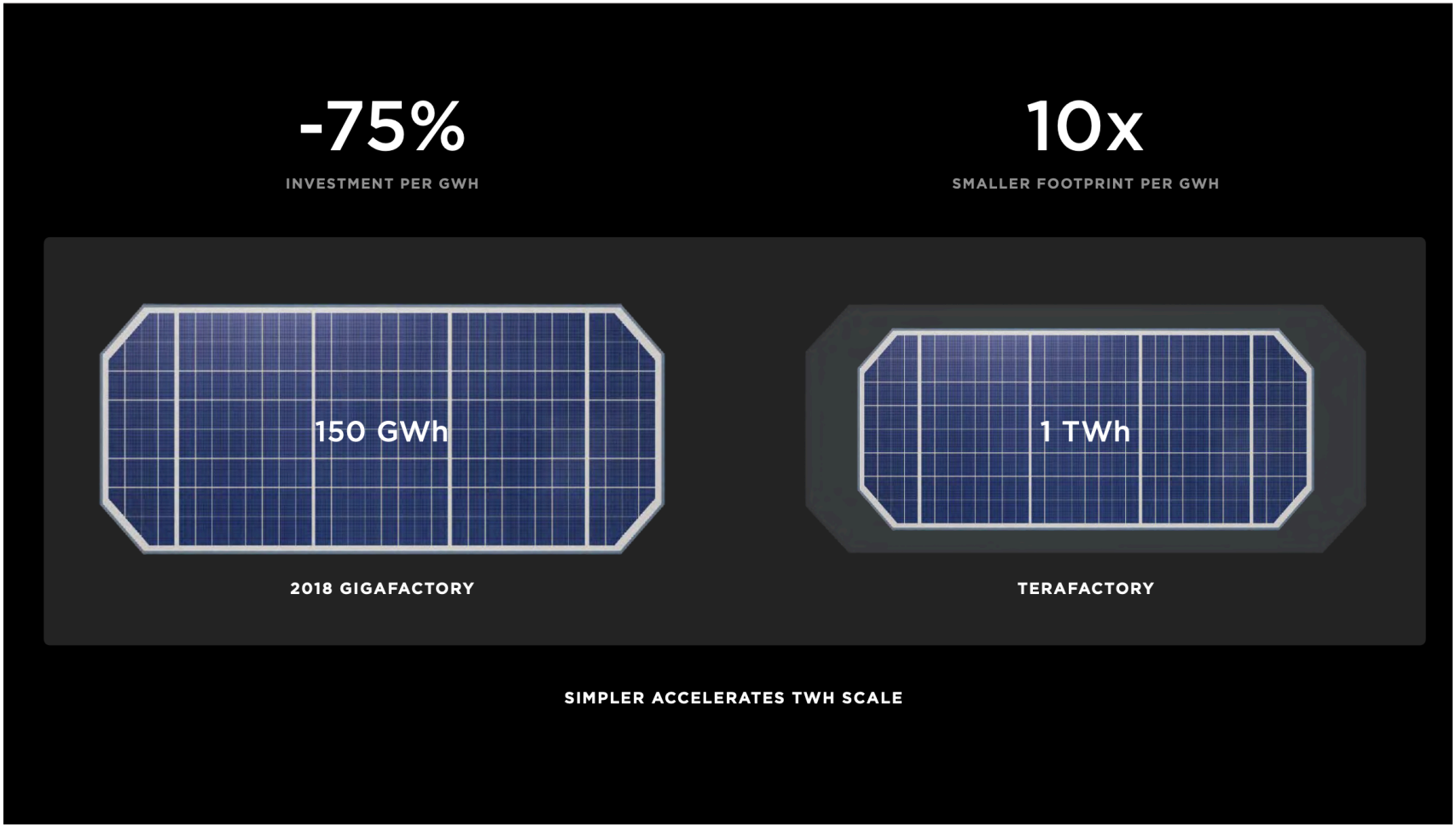
Source: https://hypercharts.co/tsla?frequency=annual

Extreme ambition: China

Extreme ambition: Germany

Extreme ambition: Texas

Extreme ambition: Factories



Extreme ambition: Battery production

One Step Ahead: Fremont (2010)

- Purchased factory from GM & Toyota:

The Mercury News

BUSINESS

2010: Tesla gets ready to take over the former NUMMI auto plant in Fremont

By DANA HULL | Bloomberg News
September 16, 2010 at 12:40 p.m.

One Step Ahead: Fremont (2010)

- Today:

Installed Annual Capacity		Current	Status
Fremont	Model S / Model X	100,000	Production
	Model 3 / Model Y	500,000	Production

One Step Ahead: Giga Nevada (2014)

- $4 to 5 billion investment:

THE VERGE TECH REVIEWS SCIENCE CREATORS ENTERTAINMENT VIDEO FEATURES M

TECH

Tesla announces plans to build battery-producing 'Gigafactory' in the US by 2017

By Nathan Ingraham | Feb 26, 2014, 5:49pm EST

Source Tesla Motors

SHARE

One Step Ahead: Giga Nevada (2014)

- Total global battery production for 2014 was around 5.4 GWh

- Giga Nevada:
  - Today: 39 GWh production per year
  - Soon: 54 GWh production per year (10x the global 2014 level)

One Step Ahead: Ridesharing (2016)

MENU TECH TIMES TECH SCIENCE BUSINESS HEALTH CULTURE

HOME / TECH / CAR TECH

No Ridesharing: Tesla Bans Drivers From Using Tesla Cars For Uber Or Lyft

22 October 2016, 1:59 pm EDT By Ted Ranosa Tech Times

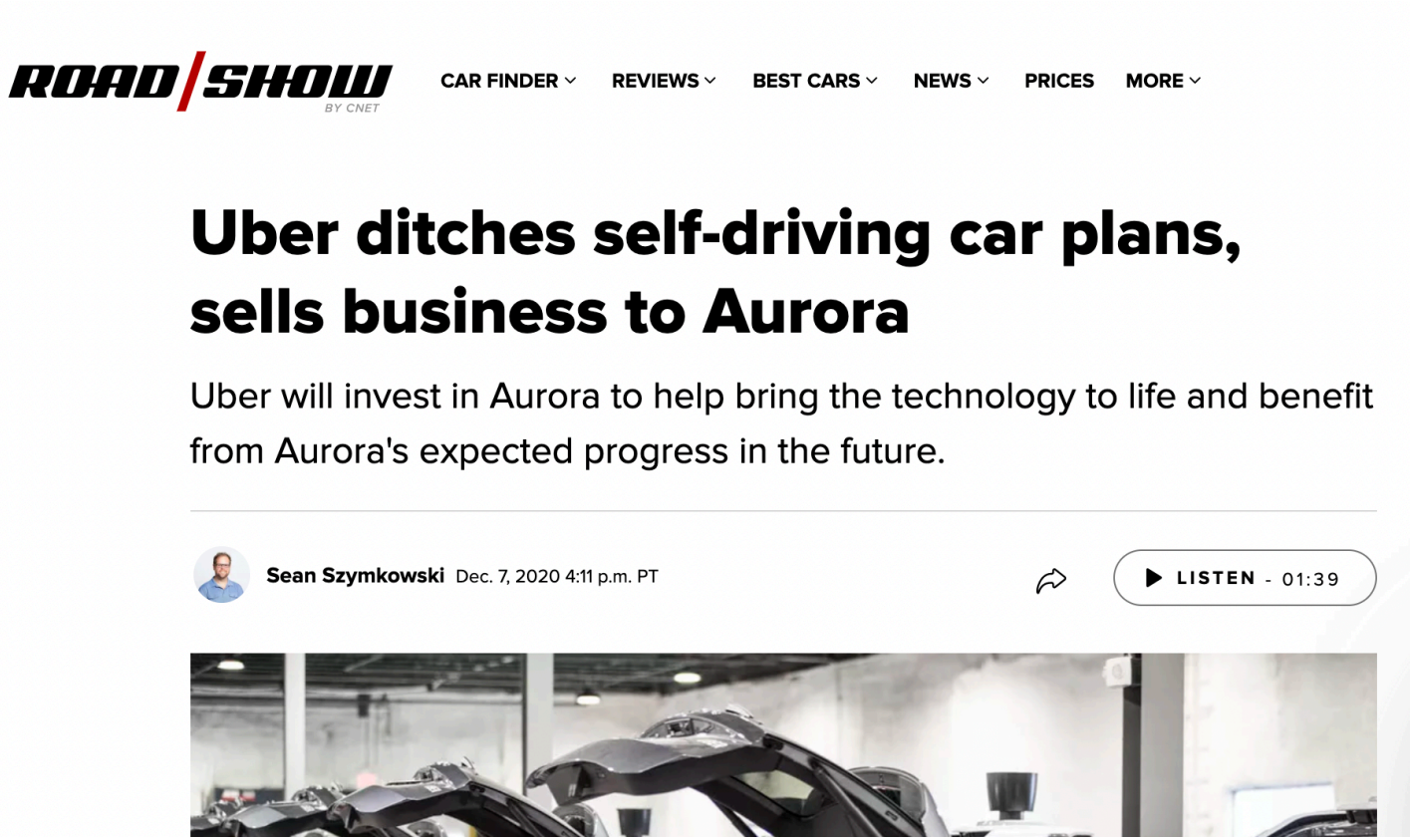
People who own Tesla cars won't be able to use their vehicles to earn money through ridesharing after the car maker banned the practice.

Tesla Motors announced on Thursday, Oct. 20, that it will not allow any of its luxury electric vehicles to be used to work for ridehailing companies such as Uber or Lyft.

While ridesharing among family and friends of Tesla drivers is still fine, the company made it clear that using its self-driving vehicles in this manner for revenue purposes will only be permitted through its Tesla Network.

Tesla CEO Elon Musk revealed in July that the company intends to create a network that would allow drivers to use Tesla's self-driving cars for ridesharing. However, Tesla hasn't provided any more details regarding this planned service as of late.

One Step Ahead: Ridesharing (2016)



One Step Ahead: Grohmann (2017)

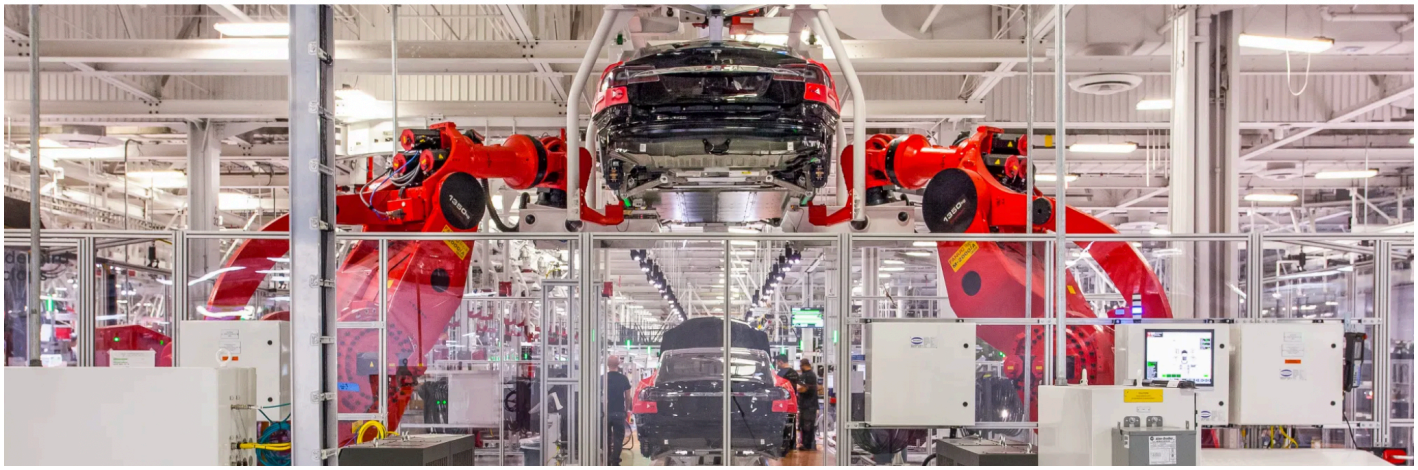
electrek

Exclusives Autos Alt. Transport Autonomy Energy Tesla Shop

JANUARY 24, 2020

Mercedes-Benz admits Tesla's acquisition of automation firm affected its battery production

Fred Lambert - Jan. 24th 2020 2:00 pm ET @FredericLambert



One Step Ahead: FSD Chip (2018)

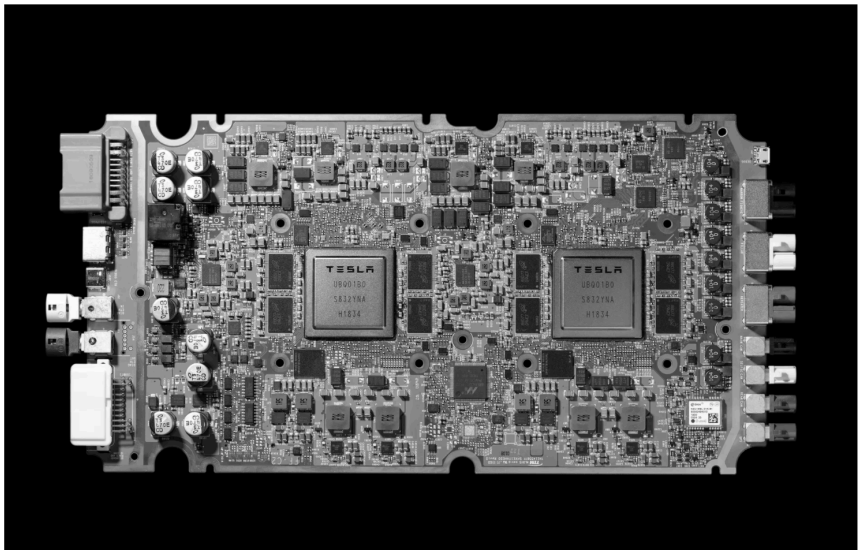
circuit breaker

Tesla's new self-driving chip is here, and this is your best look yet

18

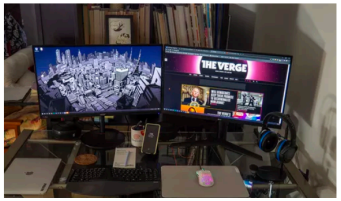
By Sean Hollister | @StarFire2258 | Apr 22, 2019, 7:08pm EDT

SHARE



VERGE DEALS

The Mac mini with the M1 processor is discounted at several retailers



One Step Ahead: Maxwell (2019)

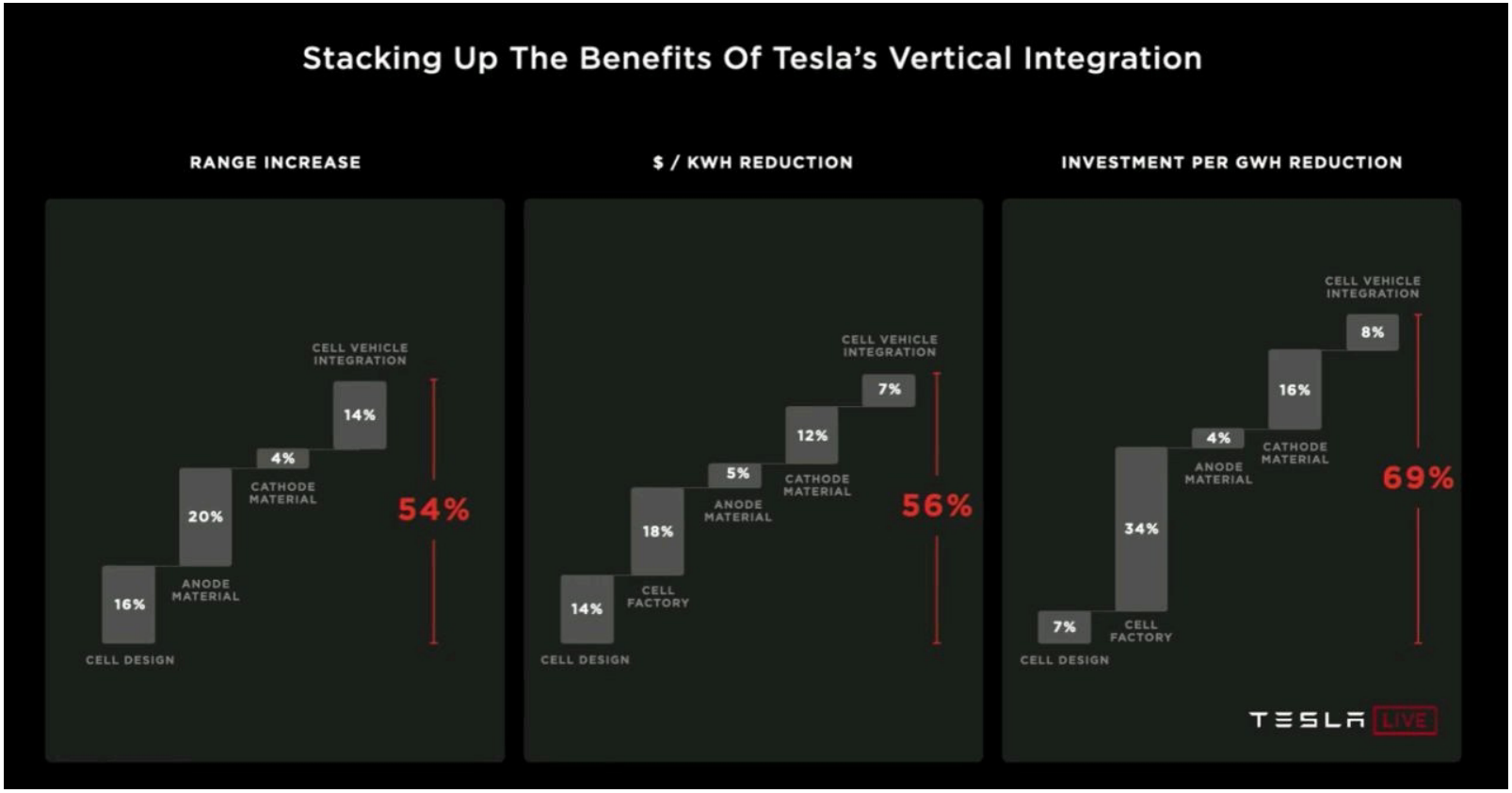
Tesla's $218M Maxwell acquisition aims to give its batteries a boost

Kirsten Korosec @kirstenkorosec / 7:02 PM GMT+1 • February 4, 2019 Comment

Image Credits: Tesla

Tesla has acquired energy storage company Maxwell Technologies in an all-stock deal valued at $218 million, a deal aimed at helping the electric automaker improve its batteries and lower costs as more competitors enter the market.

One Step Ahead: 4680 Cells (2020)

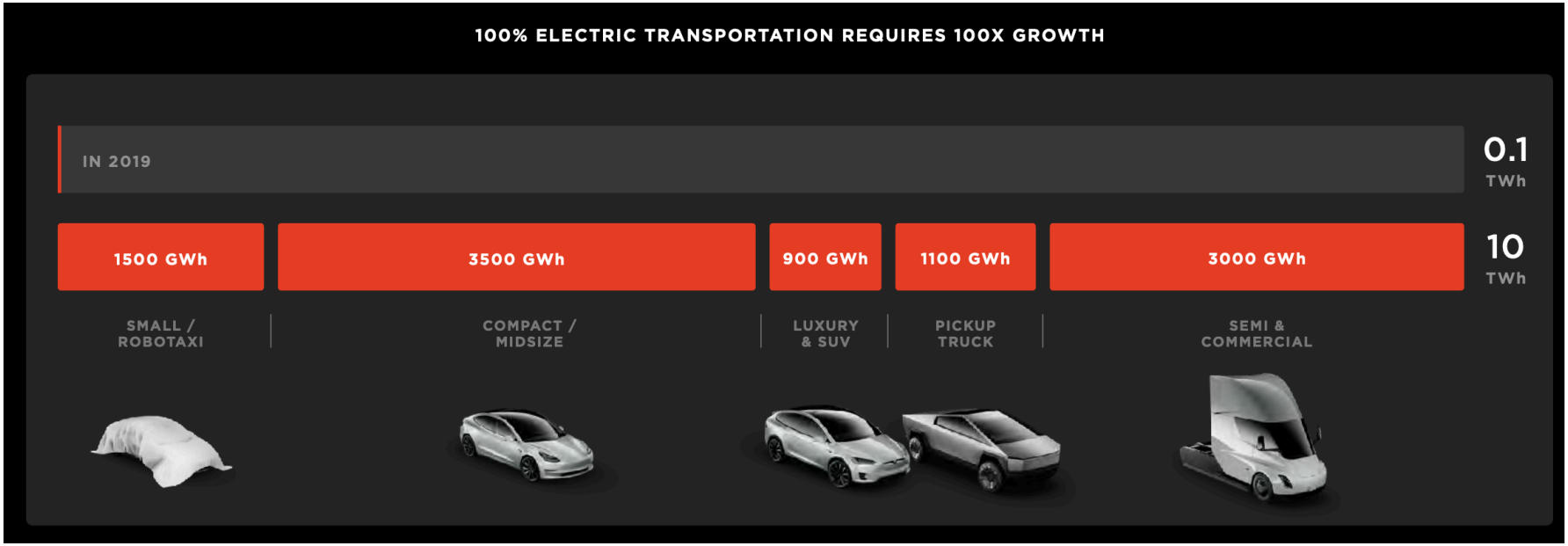


Source: https://www.youtube.com/watch?v=l6T9xIeZTds

@remouherek

Limiting Factor: Battery Supply

- To replace 100M cars per year: 10 TWh / year
  - 100x growth from today
- To replace global auto fleet: 150 TWh total



Source: https://www.youtube.com/watch?v=l6T9xIeZTds

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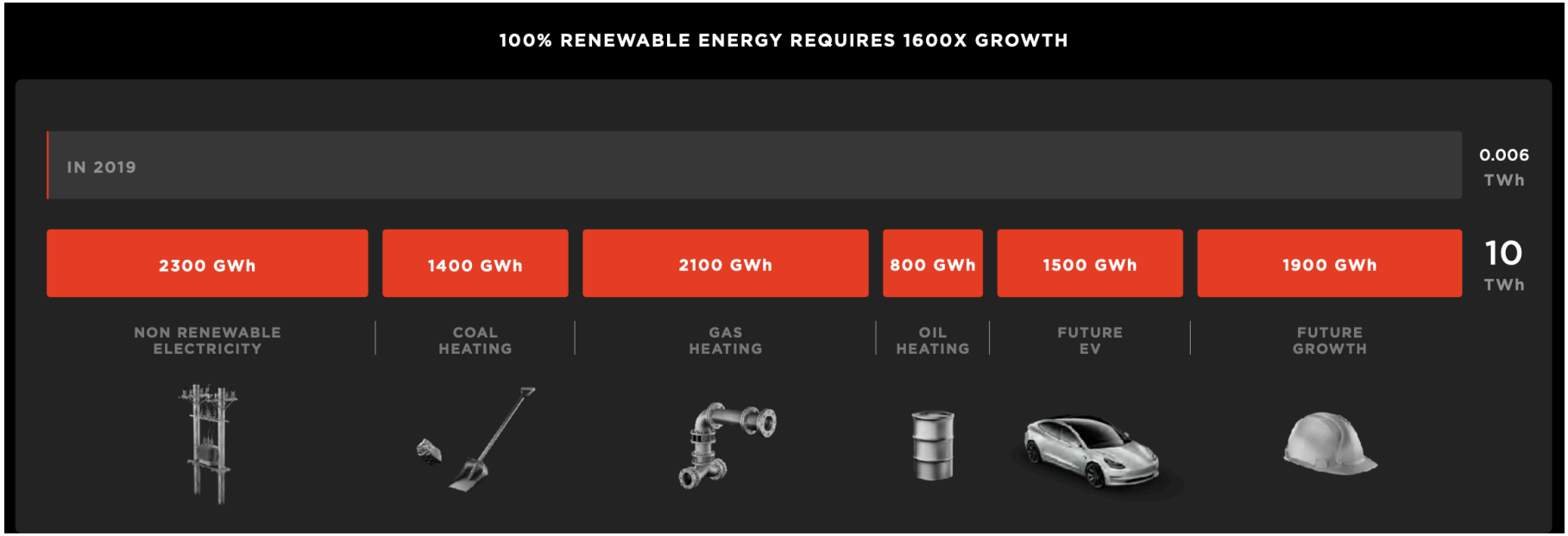
Limiting Factor: Battery Supply

- To make grid renewable: 1600x growth to 10 TWh



Source: https://www.youtube.com/watch?v=l6T9xIeZTds

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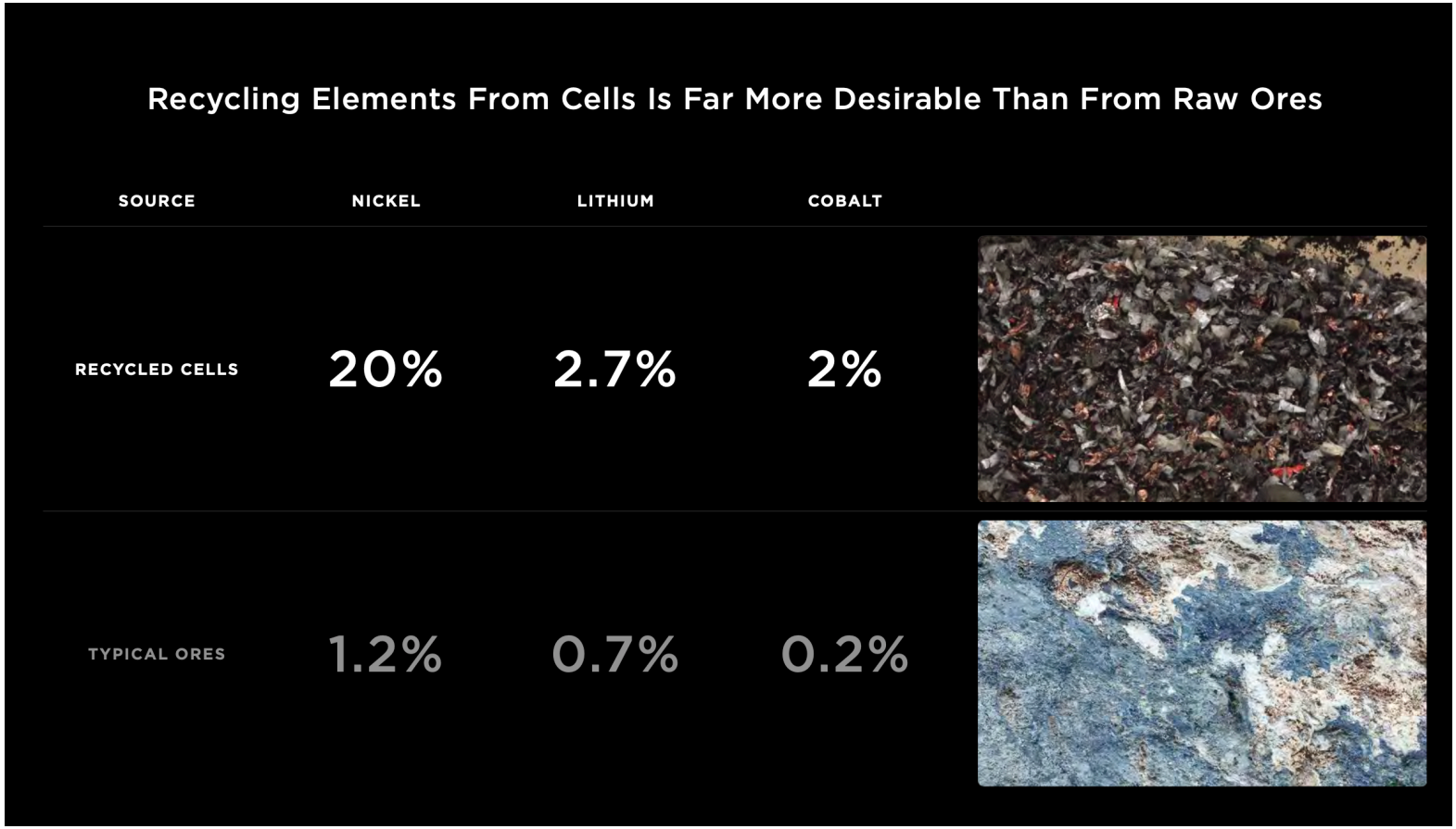
What About Recycling?



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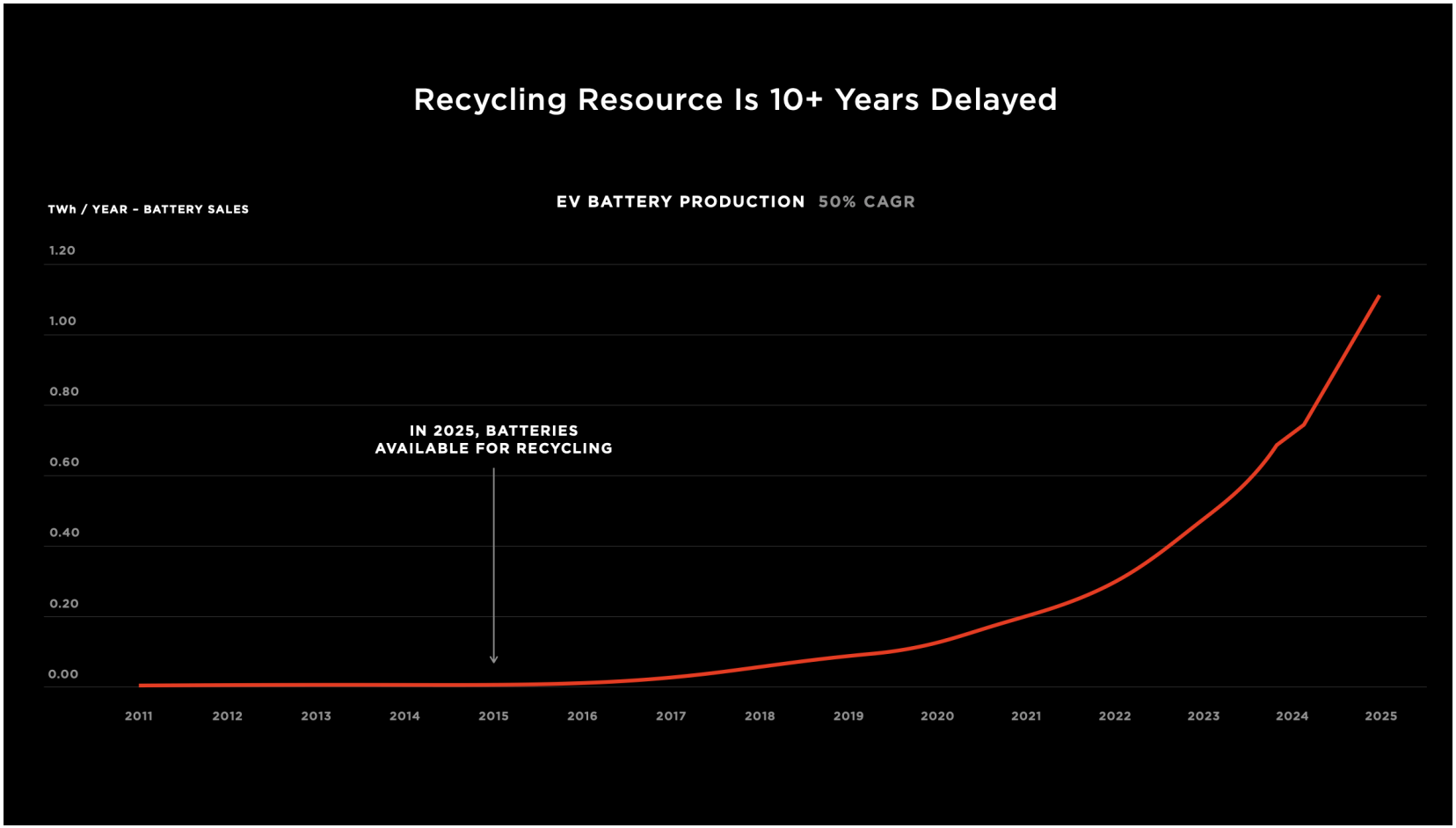
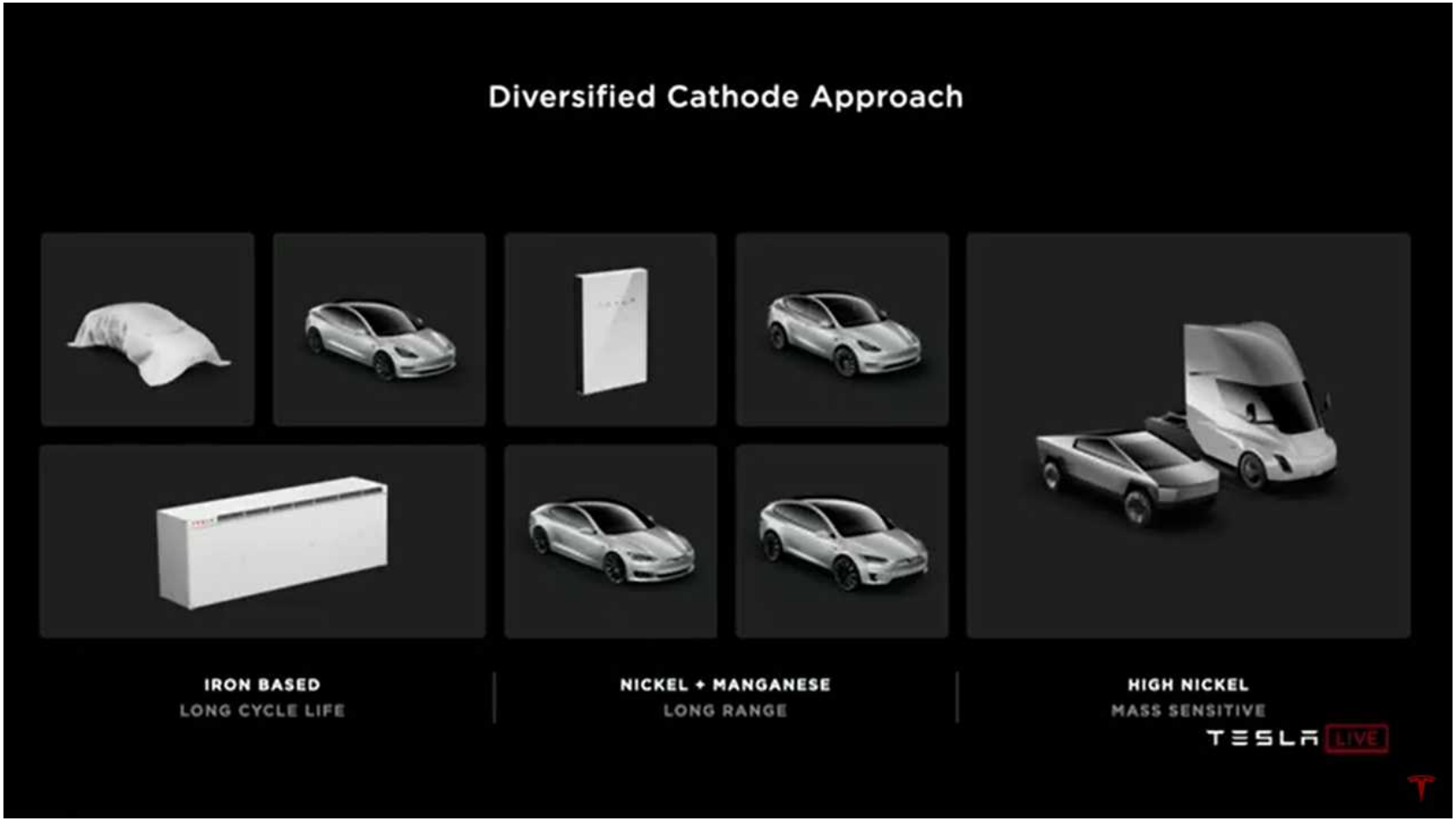
What About Recycling?



Source: https://www.youtube.com/watch?v=l6T9xIeZTds

Diversified Cathode Approach



Source: https://www.youtube.com/watch?v=l6T9xIeZTds

Nickel Reserves by Country

1. Australia

Reserves: 19 million MT

Australia holds the highest nickel reserves in the world at 19 million MT, but last year it was only the fifth-largest nickel producer in the world. In 2017, it produced 190,000 MT, down from 204,000 MT in 2016.

Some top-producing nickel mines in the country include BHP Billiton's (NYSE:BHP,ASX;BHP,LSE:BLT) Nickel West assets, which produced 90,600 tonnes of nickel in the most recent financial year, and First Quantum Minerals' (TSX:FM,LSE:FQM) Ravensthorpe mine. Ravensthorpe, which previously exported about 25,000 tonnes of nickel annually, was placed on care and maintenance in October 2017.

2. Brazil

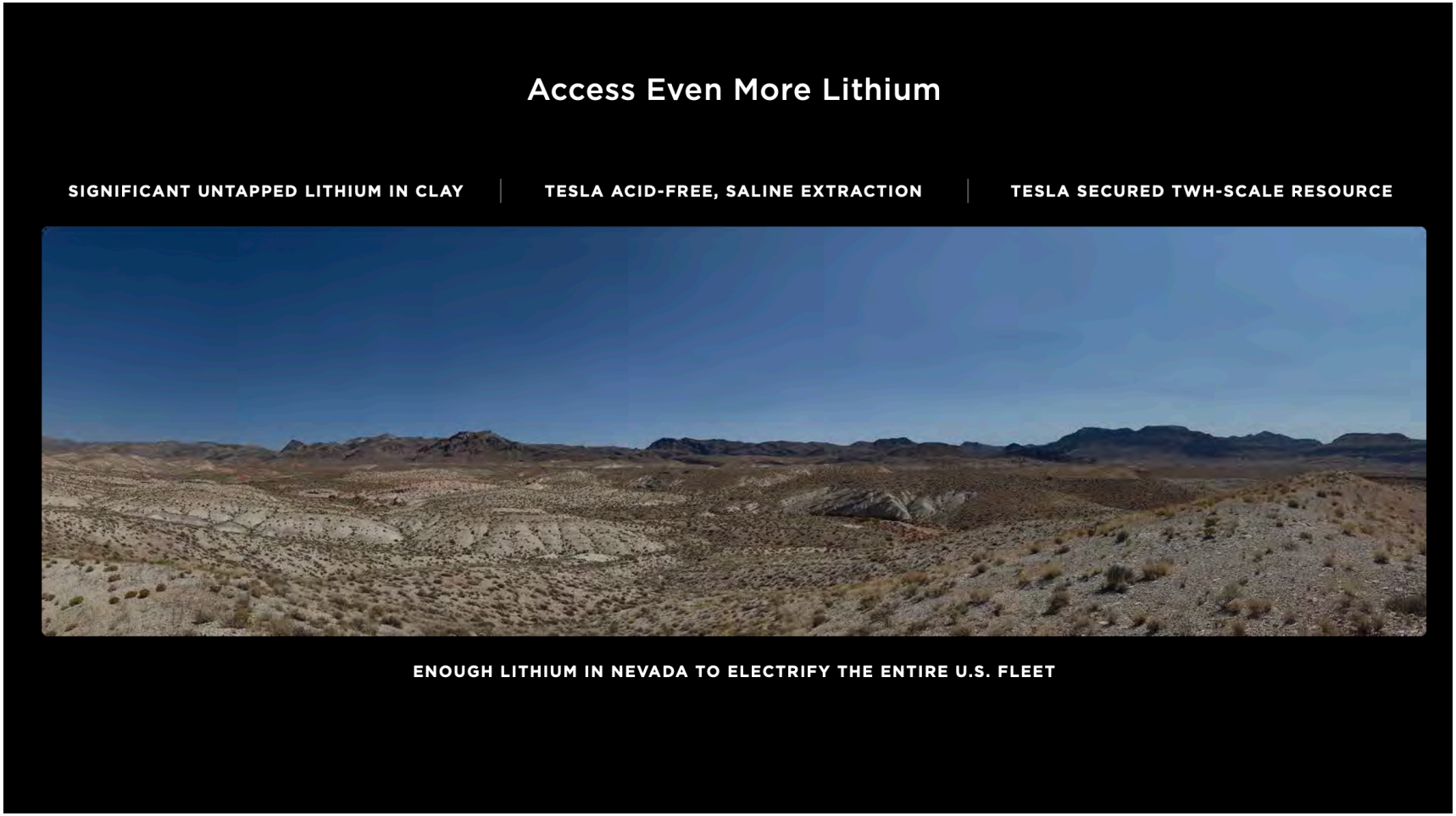
Reserves: 12 million MT

In second place is Brazil, with total nickel reserves of 12 million MT. The country saw a drop in nickel production last year, with output sinking from 160,000 MT in 2016 to 140,000 MT in 2017. Even so, it still came in as the seventh-largest nickel producer in the world.

Vale (NYSE:VALE) is based in Brazil, and is a major nickel producer in the country. Other companies mining and exploring for the base metal in Brazil include Anglo American (LSE:AAL) and Horizonte Minerals (TSX:HZM).

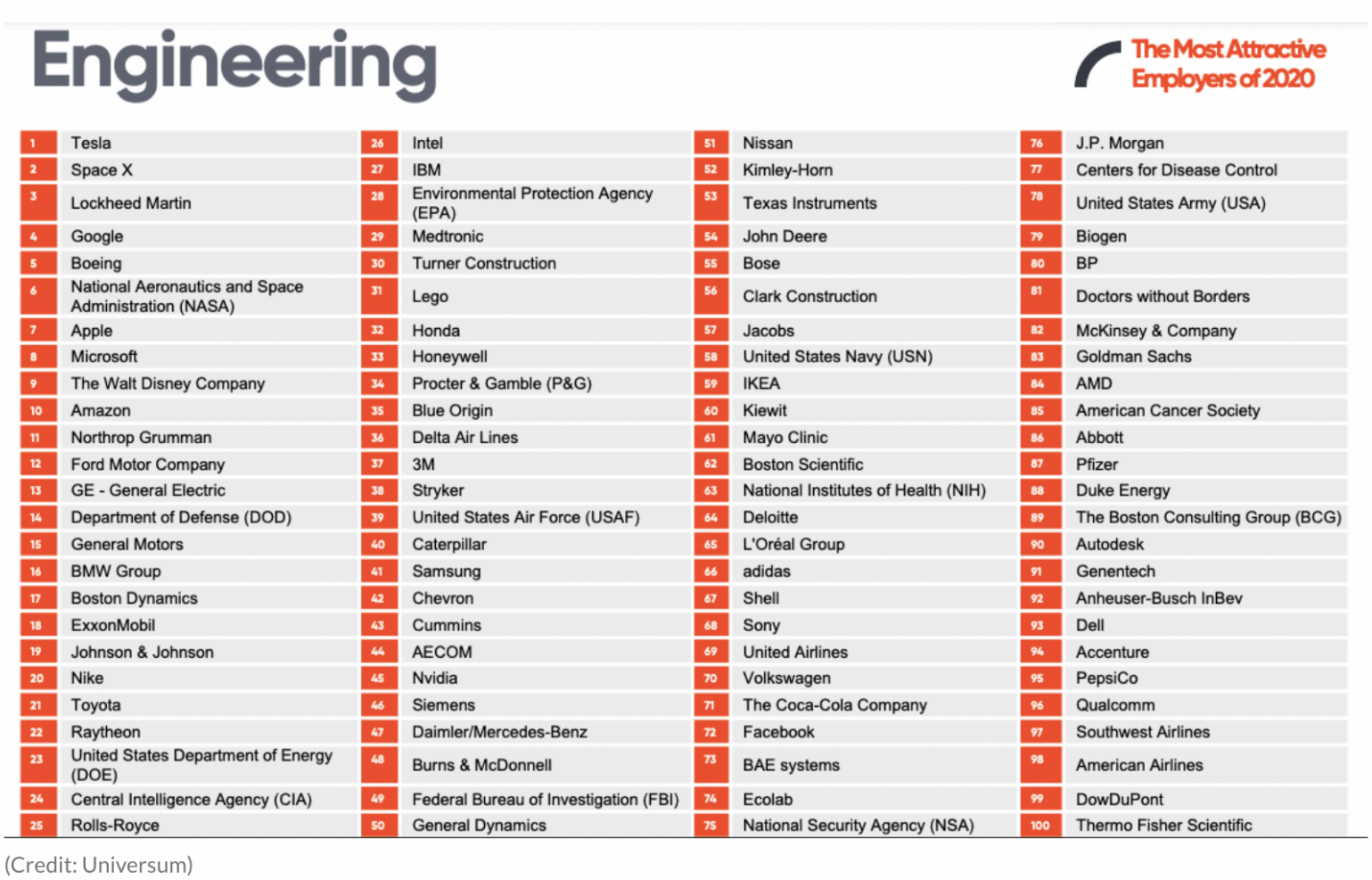
Source: https://investingnews.com/daily/resource-investing/base-metals-investing/nickel-investing/nickel-reserves-by-country/

Tesla secures Lithium supply



Source: https://www.youtube.com/watch?v=l6T9xIeZTds

Innovation: Access to Best Talent



Engineering

The Most Attractive Employers of 2020

1	Tesla	26	Intel	51	Nissan	76	J.P. Morgan
2	Space X	27	IBM	52	Kimley-Horn	77	Centers for Disease Control
3	Lockheed Martin	28	Environmental Protection Agency (EPA)	53	Texas Instruments	78	United States Army (USA)
4	Google	29	Medtronic	54	John Deere	79	Biogen
5	Boeing	30	Turner Construction	55	Bose	80	BP
6	National Aeronautics and Space Administration (NASA)	31	Lego	56	Clark Construction	81	Doctors without Borders
7	Apple	32	Honda	57	Jacobs	82	McKinsey & Company
8	Microsoft	33	Honeywell	58	United States Navy (USN)	83	Goldman Sachs
9	The Walt Disney Company	34	Procter & Gamble (P&G)	59	IKEA	84	AMD
10	Amazon	35	Blue Origin	60	Kiewit	85	American Cancer Society
11	Northrop Grumman	36	Delta Air Lines	61	Mayo Clinic	86	Abbott
12	Ford Motor Company	37	3M	62	Boston Scientific	87	Pfizer
13	GE - General Electric	38	Stryker	63	National Institutes of Health (NIH)	88	Duke Energy
14	Department of Defense (DOD)	39	United States Air Force (USAF)	64	Deloitte	89	The Boston Consulting Group (BCG)
15	General Motors	40	Caterpillar	65	L'Oréal Group	90	Autodesk
16	BMW Group	41	Samsung	66	adidas	91	Genentech
17	Boston Dynamics	42	Chevron	67	Shell	92	Anheuser-Busch InBev
18	ExxonMobil	43	Cummins	68	Sony	93	Dell
19	Johnson & Johnson	44	AECOM	69	United Airlines	94	Accenture
20	Nike	45	Nvidia	70	Volkswagen	95	PepsiCo
21	Toyota	46	Siemens	71	The Coca-Cola Company	96	Qualcomm
22	Raytheon	47	Daimler/Mercedes-Benz	72	Facebook	97	Southwest Airlines
23	United States Department of Energy (DOE)	48	Burns & McDonnell	73	BAE systems	98	American Airlines
24	Central Intelligence Agency (CIA)	49	Federal Bureau of Investigation (FBI)	74	Ecolab	99	DowDuPont
25	Rolls-Royce	50	General Dynamics	75	National Security Agency (NSA)	100	Thermo Fisher Scientific

(Credit: Universum)

Tesla Management Style

The Anti-Handbook Handbook

We're Tesla. We're changing the world. We're willing to rethink everything.

We're a high tech company unlike any other high tech company. We're a car company unlike any other car company.

We're different and we like it that way. Being different allows us to do what no one else is doing; to do what others tell us is impossible.

If you're looking for a traditional employee handbook filled with policies and rules, you won't find one. Policies and rules tell you where the bottom is – they tell you how poorly you can perform before you get shown the door. That's not us.

We prefer to have incredibly high standards and to hire exceptional people who enjoy pushing themselves to perform at the highest levels every day. We want to surround ourselves with people driven to do the right things and act with integrity even when no one is looking.

Is this you? If so, we're glad you're here and we look forward to doing amazing things together. If this isn't you, you'll be more successful somewhere else. We don't mean to sound harsh; it's just the truth.

Source: https://content.tcmediasaffaires.com/LAF/lacom2020/Tesla-Anti-Handbook.pdf

Tesla Management Style

- „The best part is no part, the best process no process.“
- „The best service is not needing service.“
- Lines of code
  - „I would consider a large number of lines of code to be bad, not good.“
  - „I generally give two points for deleting a line of code, one point for adding a line of code.”
- Hire the best & fire people that don’t get the job done

Startup DNA / Collection of Startups

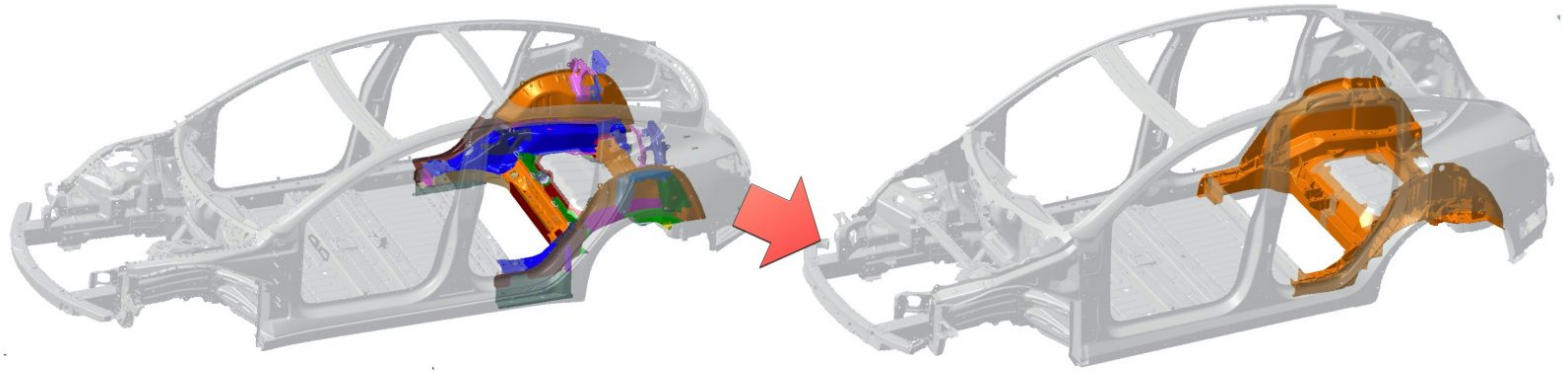
- Vertical integration
- Tight feedback loops
- Quick iteration
- Agility
- First principles thinking

	Tesla Start Up	Competition
Auto	Car, Trucks, Semi	BMW, Ford, GM etc
	Powertrain	BorgWarner, Bosch, Mitsubishi
	Seats	Faurecia, Lear Corp, Johnson Controls
	Service	Dealer Networks
Hardware + Software	Infotainment / Car OS	Apple Carplay, Android Auto
	FSD Chip	Nvidia etc
	Dojo (beta)	Google ML Services, Intel's Aurora's exaFLOP
	Autopilot / FSD (beta)	Waymo, MobilEye, Cruise etc
	Vision Tech (beta)	Lidar, HD Maps
	Insurance (beta)	Geico, Progressive etc
	App Store (early)	Apple App Store, Google Play
	Robo Taxi (early)	Uber, Lyft
Energy	Supercharger Network	Electrify America, Charge Point, Gas Stations etc
	Solar Panels and Tiles	Sunrun, Roofing, Shingles etc
	Powerwall	Panasonic EverVolt, Generac
	Utility Services (Grid, Storage, Autobidder)	Utility companies
Engineering	Battery cells (early)	Panasonic, LG Chem etc
	Giga / Terafactories	
	Part design (eg Octovalve, heat pump)	Bosch, Denso, Magna, Continental etc
	Materials (alloys etc)	
	Automation / Robotics (Grohmann)	Automation companies
Home	HVAC (early)	
	Leaf blower (early)	
Other	RNA microfactories	
	Internal Enterprise Software	SAP, SalesForce equivalent
	Mining (early)	Mining companies

@vm_one1 (edits by @remouherek)

Innovation: Seats

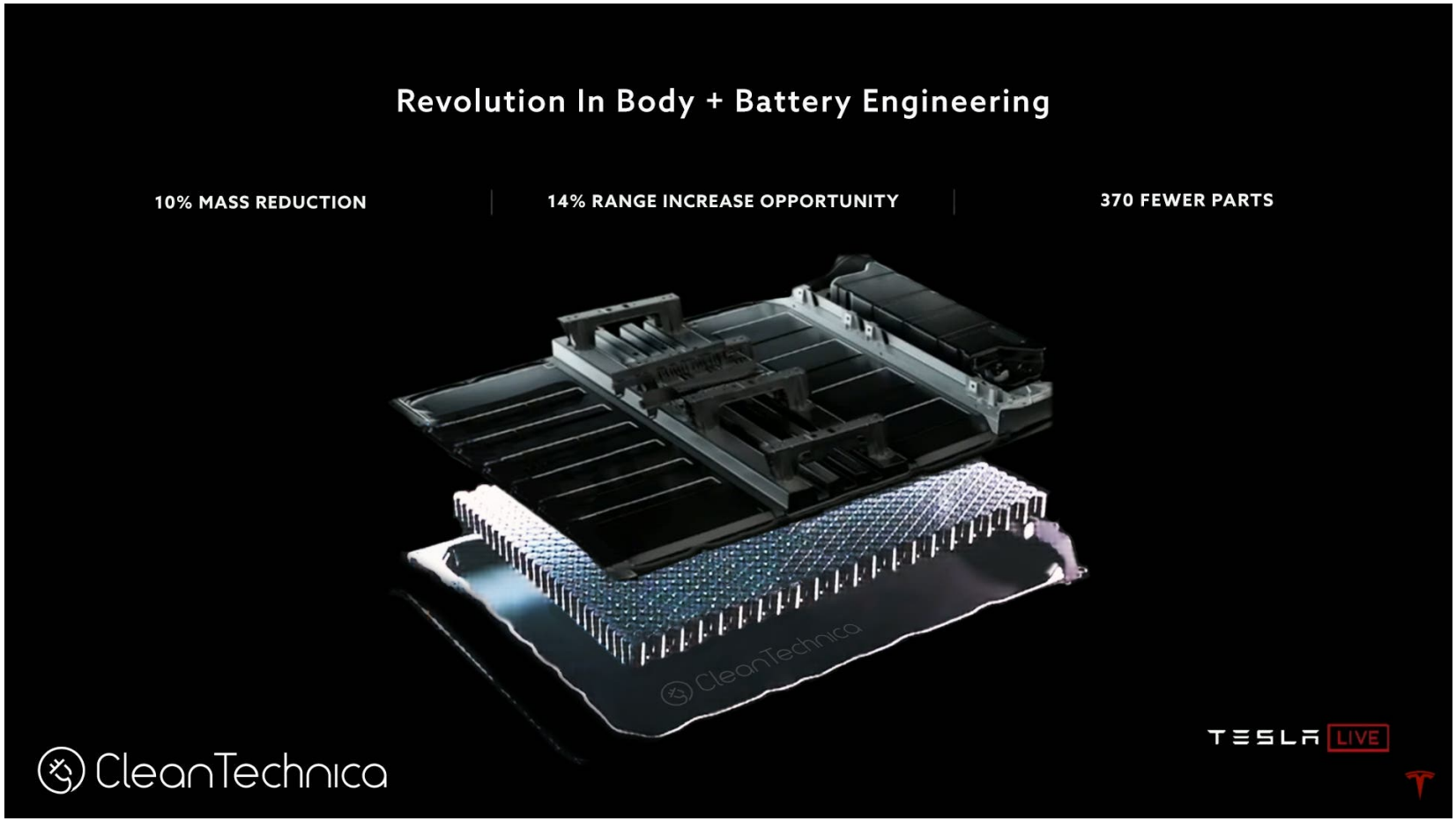
Innovation: Mega Casting



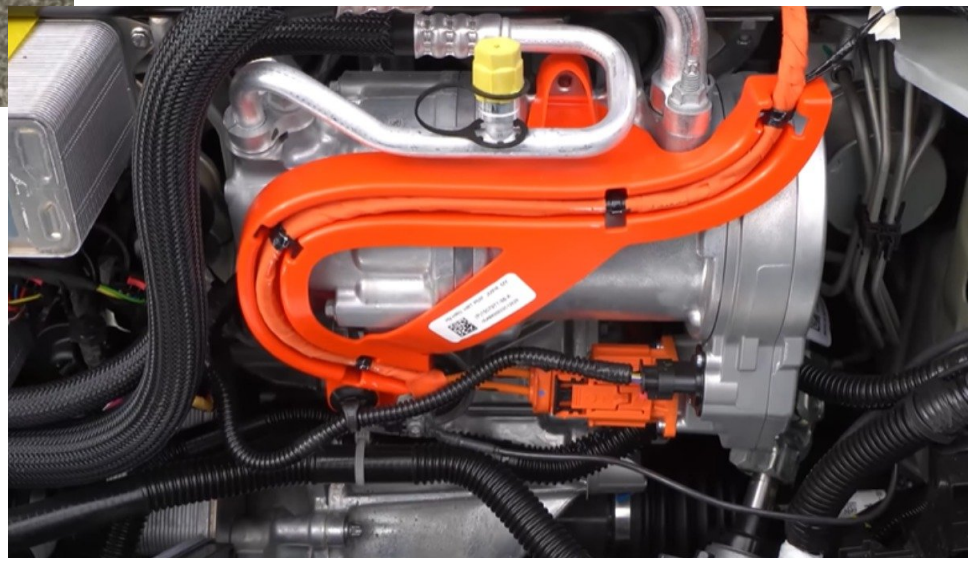
Model 3 rear underbody
70 pieces of metal

Model Y rear underbody
2 pieces of metal (eventually a single piece)

Innovation: Structural Battery Pack



Innovation: Octovalve + Heat pump



Superior Technology: Core Efficiency

EV Core Efficiency - Matt Joyce @matty_mogul					
Electric Vehicle (*EPA Estimate)	Starting Price ($USD)	Battery (kWh)	EPA Range (Miles)	Weight (Lbs)	Core Efficiency (kWh/Range/Weight)
Tesla Model X LR	$79,990	100	371	5,421	5.0
Tesla Model S LR	$69,420	100	402	4,883	5.1
Tesla Model Y LR	$49,990	75	326	4,416	5.2
Tesla Model 3 LR	$46,990	75	353	4,032	5.3
Tesla Model 3 SR+	$37,990	50	263	3,554	5.3
Hyundai Ioniq	$33,045	38	170	3,366	6.6
Hyundai Kona	$37,190	64	258	3,715	6.7
Mercedes EQC*	$67,900	80	220	5,346	6.8
Ford Mustang Mach E*	$49,800	99	300	4,727	7.0
Nissan Leaf S Plus	$38,200	62	226	3,882	7.1
Chevy Bolt	$36,620	66	259	3,563	7.2
Volvo Polestar 2*	$59,990	78	233	4,680	7.2
Renault Zoe*	$26,000	52	216	3,311	7.3
Rivian R1S*	$72,000	135	310	5,842	7.5
Rivian R1T*	$69,000	135	300	5,886	7.6
Audi e-tron Sportback	$65,900	95	204	5,843	8.0
Xpeng G3*	$29,102	66	226	3,609	8.1
Jaguar I-Pace	$69,850	90	234	4,702	8.2
Nio ES8*	$67,000	84	185	5,423	8.4
BMW i3	$44,450	42	153	2,972	9.2
Porsche Taycan 4S Perf+	$117,110	93	203	4,953	9.2
Core Efficiency = Battery kWh / (EPA Range/100 Miles) / (Vehicle Weight/1,000 lbs)					

Source: https://twitter.com/matty_mogul

Superior Technology: Longevity

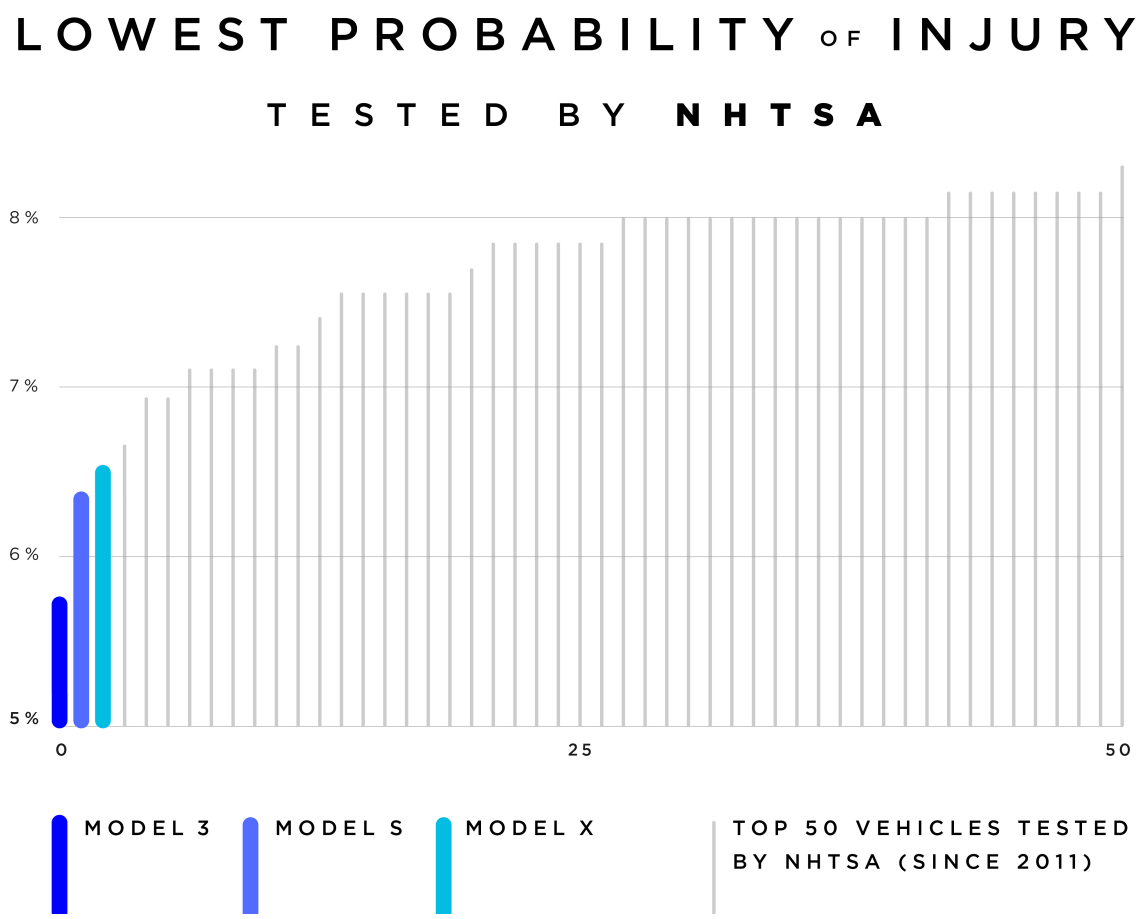
electrek

Exclusives Autos Alt. Transport Autonomy Energy Tesla Shop

A Tesla Model S reaches 1 million km for first time

Fred Lambert - Nov. 30th 2019 5:02 am ET @FredericLambert

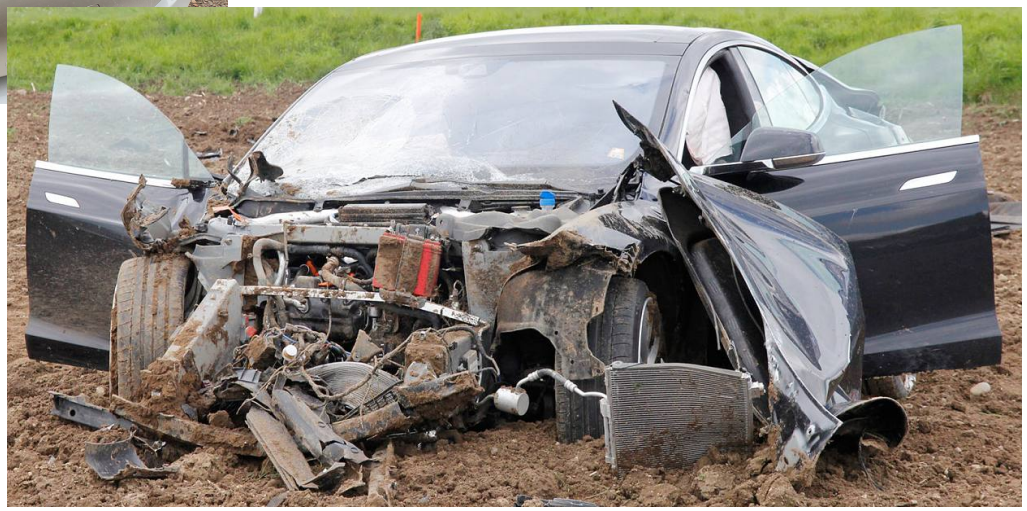
Model 3 achieves the lowest probability of injury of any vehicle ever tested by NHTSA



Safety

@remouherek

Safety: Large crumple zone (no engine)



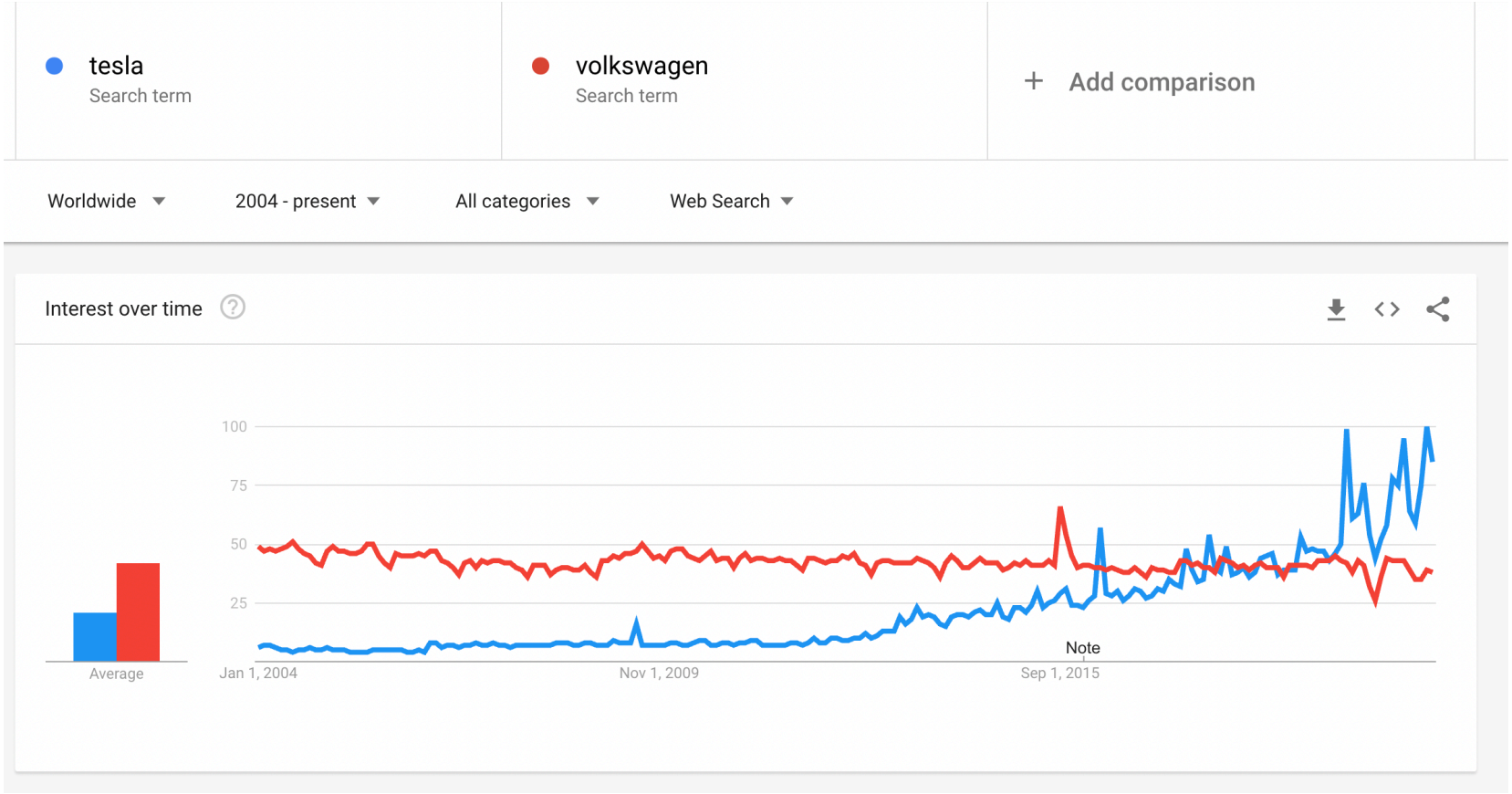
Superior Product

- No paid advertising
- 100% word-of-mouth
- Product made with love

Rank 2020	2019	Brand	Owner Satisfaction (Average of all models)
1	—	Tesla	88
2	▲ 1	Genesis	81
3	▲ 17	Lincoln	78
4	▼ 2	Porsche	77
5	▼ 1	Subaru	75
6	▼ 1	Audi	75
7	▲ 5	Ford	74
8	▲ 17	Hyundai	73
9	▼ 2	Toyota	73
10	▲ 3	Mini	72
11	▲ 10	Dodge	72
12	▲ 3	Chrysler	71
13	▼ 5	Honda	70
14	▲ 5	Volkswagen	70
15	▼ 6	Kia	70

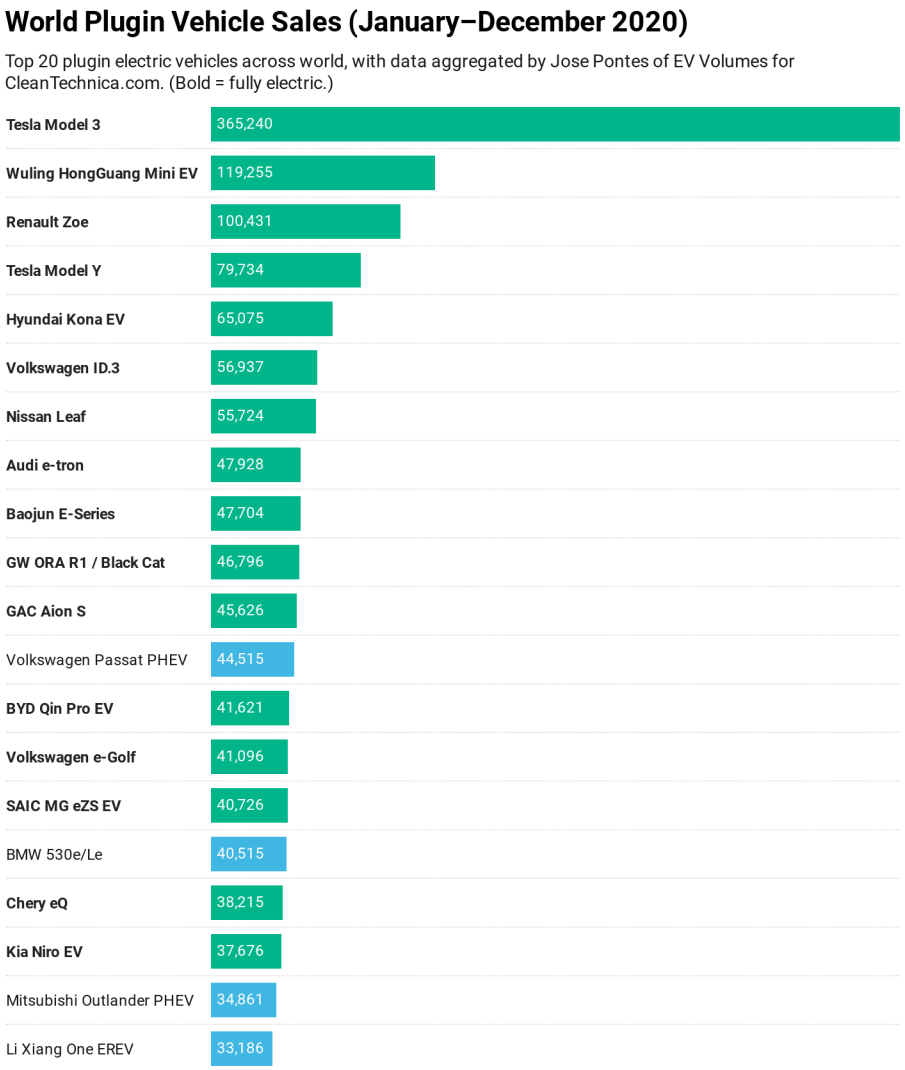
Source: https://www.tesmanian.com/blogs/tesmanian-blog/tesla-topped-1st-place-in-consumer-reports-owner-satisfaction-survey

Word of mouth



Source: https://trends.google.com/trends/explore?date=all&q=tesla,volkswagen

#1 Best-Selling EV (soon #1 + #2)



@remouherek

Strong Margins

- Unique business model
  - Hardware + Software
  - Similar to Apple
  - In-app-purchases

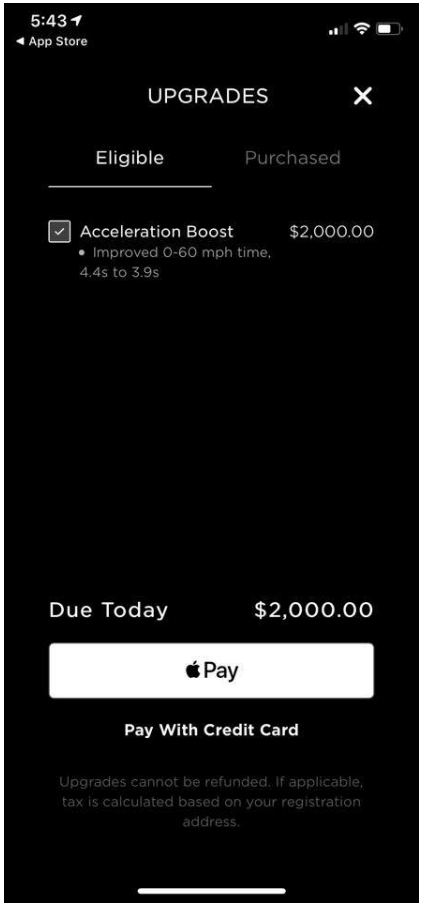
Full Self-Driving Capability

$10,000

- Navigate on Autopilot
- Auto Lane Change
- Autopark
- Summon
- Full Self-Driving Computer
- Traffic Light and Stop Sign Control

Coming later this year

- Autosteer on city streets



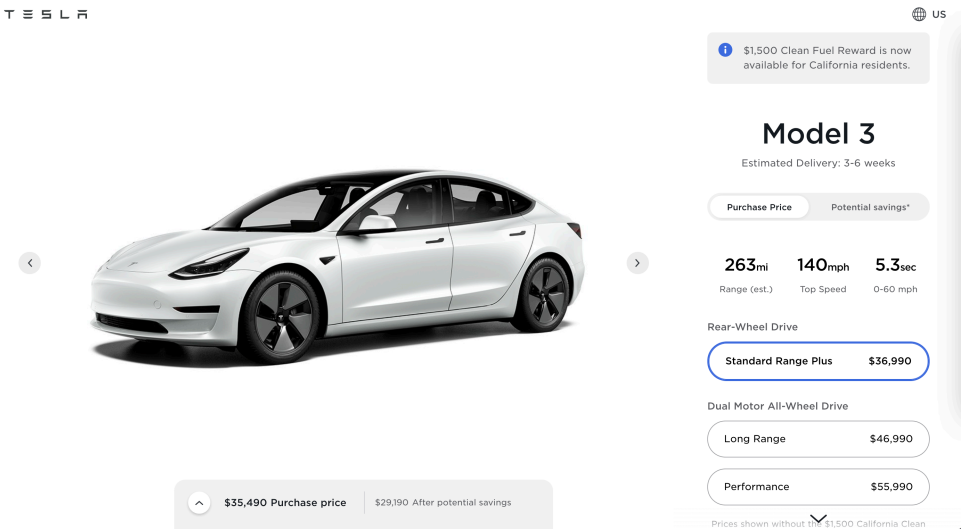
- 35-40% Gross Profit Margin
- 10-15% Net Profit Margin

- Detailed video: https://www.youtube.com/watch?v=xAlVJHNQi6Y

Direct to Consumer

- A Tesla can be ordered in less than 2 minutes from a phone

- Try to do that at any other major car company. I tried, and the user experience is so much worse



„Unlimited“ Total Addressable Market

- Auto
  - Even if they achieve 20M vehicles, this results in „only“ a 20% production market share
- Mobility
  - Robotaxi service could scale to trillions of dollars in revenue
- Energy
  - Only a small fraction of homes have solar panels
  - Only a small fraction of homes have battery storage
  - Upgrade of the old grid / replacement of peaker plants

Competition: Old Auto

- Facing the innovator‘s dilemma:
  - Values and processes not compatible with new reality (software + tech first)
  - Path dependency: Dealerships, ICE customers
  - Want to milk the ICE products until the end
  - Want to soften the transition with Plug-in-Hybrids, diverts energy
  - Not willing to make radical moves (e.g. selling ICE units)

- While they will produce decent electric vehicles (hardware), they will have trouble with software, technology and agility (Silicon Valley mentality)

- Explainer: https://www.youtube.com/watch?v=zOvYMHPhYHs

Competition: Startups

- Easy to build prototypes, very hard to achieve mass production
- It took Tesla 17 years and $20 billion of capital investment to get to mass production and profitability
- Startups like Rivian will likely get acquired by larger players (like Amazon)

Competition: Big Tech

- Amazon, Apple and Google likely become serious competitors
  - Especially if they acquire startups or legacy auto companies

- Hard to predict, but I see a world in which:
  - Old auto will license all major hardware + software (i.e. become shells)
  - 1-2 big tech companies become major players
  - 1-2 relevant Chinese companies

Competition: 2012 Model S

Tesla's 2012 Model S Is 61% More Efficient Than Audi's New E-Tron

May 10, 2019 10:00 AM ET | **Tesla, Inc. (TSLA)** | AUDVF, GM, HMC... | 511 Comments | 51 Likes

Summary

- Tesla's 2012 Model S (208 mi range, 60kWh battery) is better than Audi's brand new E-Tron (204 mi range, 95kWh).
- In April, Jaguar sold just 237 I-PACE electric vehicles, and as of today, there are more than 200 sitting on Jaguar of Newport Beach, making up 45% of the dealer's total inventory.
- The new Volkswagen ID is touting 340 miles of range, but hopefully, this isn't like Audi, which said the e-tron would have 50% more range than it has today.

Source: https://seekingalpha.com/article/4262289-teslas-2012-model-s-is-61-efficient-audis-new-e-tron

Tesla‘s Competitive Advantages

- Pace of innovation
- Best talent
- Genius owner-operator with extreme ambition
- Unique culture
- Mission-driven company
- Data advantage (largest fleet of smart cars)
- Speed of execution (Giga Shanghai)
- Startup DNA / Silicon Valley DNA
- Vertical integration

Disruption: 10x Better

- If you want to disrupt something, you can‘t just be 10% better
- You need to be 10x better
- Tesla is 10x better than old auto
- But you can‘t disrupt Tesla by being 10% better than Tesla
- **Companies that come after Tesla are cursed by new baseline**

Short-term vs. Long-term

- Famous Bill Gates quote: People overestimate what they can achieve in 1 year, and underestimate what they can achieve in 10 years

- Same is true for Tesla:
  - People overestimate what they can do in 1-3 years, and underestimate what they can do in 10-15 years

Owner-Operator

- Elon Musk owns 20.7% of Tesla

Meanwhile at Volkswagen (Nov, 2020)

"Mission T" to catch up with Tesla

As a result, we had to tailor Volkswagen's strategy to keep up with these new competitors. To this end, we organized a second workshop with Professor Malik in April 2020. 31 senior executives from Volkswagen, Audi and Porsche were involved in 'Mission T', as it was dubbed. The event revolved around how we can catch up with Tesla – a company focused exclusively on the future, without a traditional car business. Its Silicon Valley-style ecosystem is influenced by software capabilities, focus on technology and risk culture. The workshop was held over three days – under special constraints with masks and social distancing due to the COVID-19 pandemic. The opening question was: "What do we have to achieve in the next six months to catch up with Tesla in terms of technology by 2024?"

Source: https://www.linkedin.com/pulse/how-we-transform-volkswagen-herbert-diess/

Long-Term Valuation

Goals of Tesla

- Accelerate the transition to sustainable energy
- Increase affordability (decrease cost)
- Remove primary limiting factor (battery cell production)
- Accelerate compound annual growth rate (>50% CAGR)
- Make 20M cars per year to replace 1% of global fleet
- 3 TWh of own battery cell production in 2030
- Transition energy grid to renewable
- Robotaxi service

Revenue in 2030

- Auto:
  - 15M vehicles x $25,000 = $375 billion
- Software:
  - 15M vehicles x $10,000 = $150 billion
- Robotaxi:
  - 2x the size of UBER in 2020 = $120 billion
- Solar:
  - 10M roofs x $15,000 = $150 billion
- Storage:
  - 50x the level of 2020 = $100 billion

- **Total: $895 billion in 2030**

Revenue in 2030

- A large range of possible outcomes:
  - 10M to 20M cars per year
  - FSD package could sell for $50,000+ per car if $30,000 gross profit per year can be achieved with robotaxi service
  - Energy business could become as large as auto business ($250+ billion)
  - Robotaxi service could become much bigger
  - New lines of products might be added (FSD licensing, insurance for 3rd parties, pre-fabricated homes, ...)

Revenue in 2030

- It comes down to
  - Do you believe in the vision?
  - Do you believe in their ability to execute?
  - Tesla is fundamentally an unpredictable high-growth company

Profitability in 2030

- Revenue: $895 billion
- Gross Profit 35% = $313 billion
- **Net Profit 15% = $134 billion**

Market Cap in 2030

- Revenue = $895 billion
- Net Profit = $134 billion

- **3x Revenue = $2.7 trillion**
- **6x Revenue = $5.4 trillion**

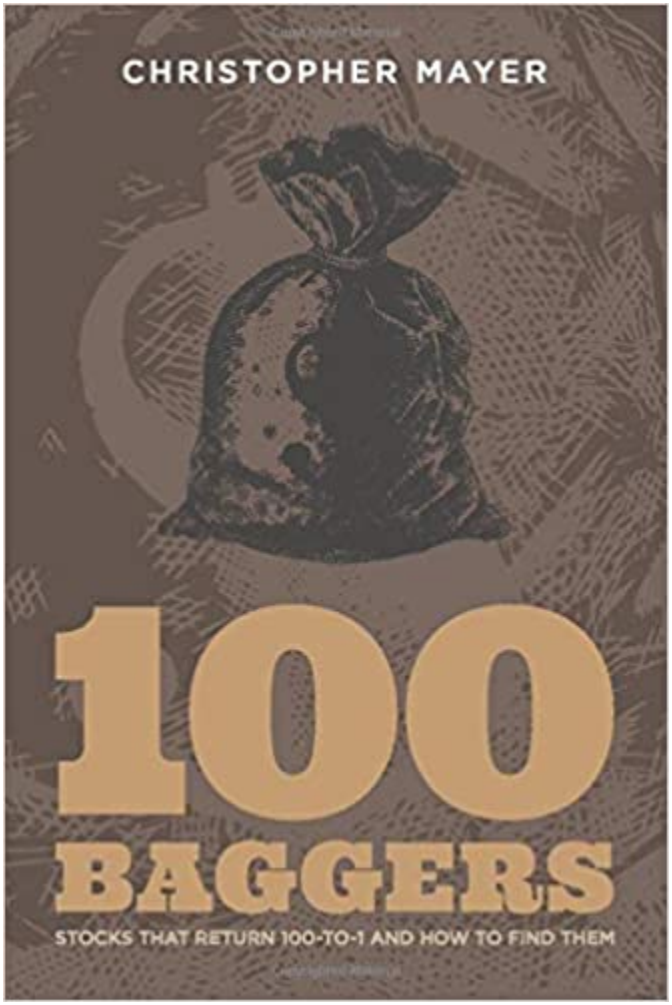
- **P/E 25 = $3.4 trillion**
- **P/E 50 = $6.7 trillion**

Comparisons

- **Amazon** (2020):
  - Revenue: $386 billion
  - Net Profit: $21 billion
  - Valuation: $1.6 trillion (Feb 21)

- **Apple** (2020):
  - Revenue: $274 billion
  - Net Profit: $57 billion
  - Valuation: $2.1 trillion (Feb 21)

Checklist: 100 Baggers



Checklist: 100 Baggers

>20% growth per year: ✅

Long runway: ✅

High returns on capital (>20% ROE): ⚠️ (not yet)

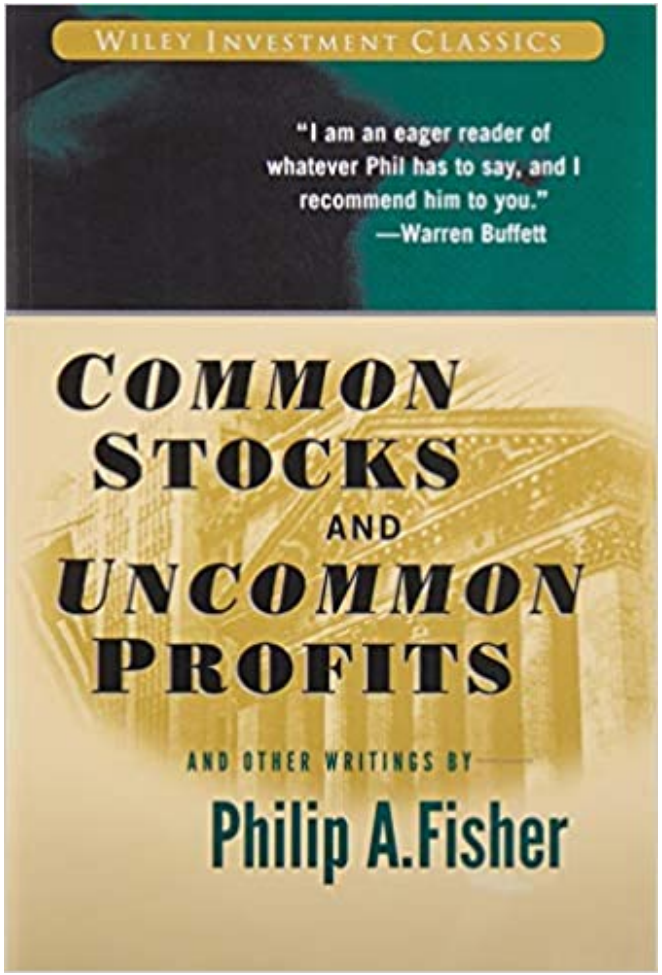
High margins: ✅

Great capital allocation: ✅

Good management / Owner-operator: ✅

Competitive advantage: ✅

Checklist: Phil Fisher (Growth)



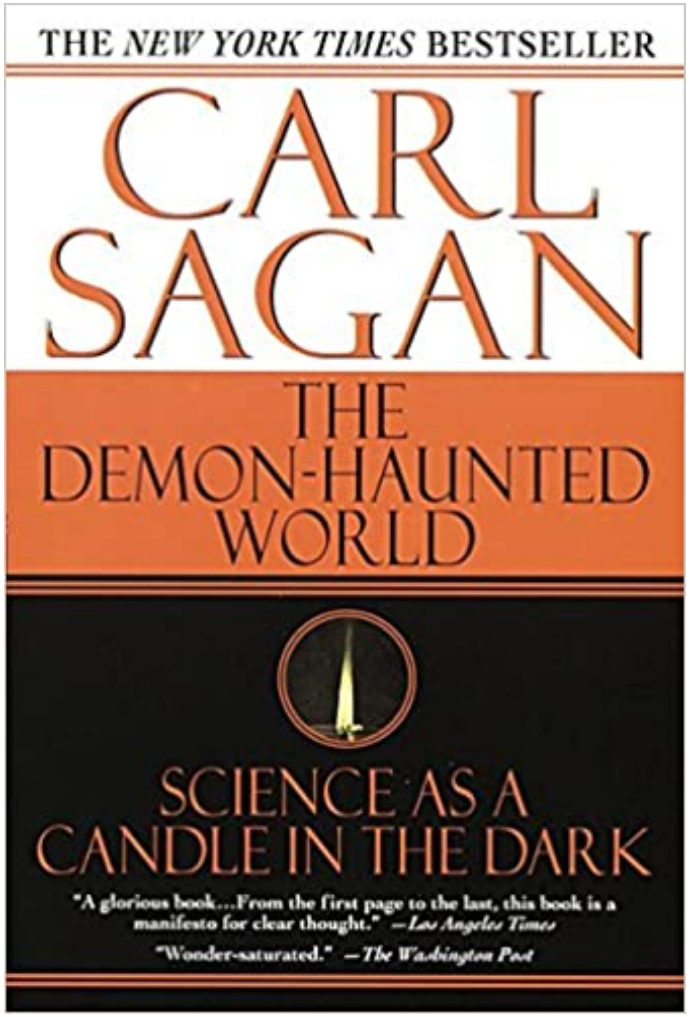
Checklist: Phil Fisher (Growth)

1. Sufficient growth potential? ✅
2. New products through R&D? ✅
3. R&D effectiveness? ✅
4. Above average sales organization? ✅
5. Worthwhile profit margin? ✅
6. Profit margin improvement possible? ✅
7. Outstanding labor/personnel relations? ✅
8. Outstanding executive relations? ✅
9. Management depth? ⚠️ (Elon is not replacable)

Checklist: Phil Fisher (Growth)

10. Cost analysis & accounting control? ✅
11. Outstanding in relation to competition? ✅
12. Long-term outlook in terms of profits? ✅
13. Small dilution compared to growth potential? ✅
14. Management upfront with bad news? ✅
15. Management of unquestionable integrity? ✅

Checklist: Carl Sagan (Baloney Detection)



@remouherek

Checklist: Carl Sagan (Baloney Detection)

1. Wherever possible there must be independent confirmation of the “facts.”

2. Encourage substantive debate on the evidence by knowledgeable proponents of all points of view.

3. Arguments from authority carry little weight — “authorities” have made mistakes in the past. They will do so again in the future. Perhaps a better way to say it is that in science there are no authorities; at most, there are experts.

Checklist: Carl Sagan (Baloney Detection)

4. Spin more than one hypothesis. If there's something to be explained, think of all the different ways in which it could be explained. Then think of tests by which you might systematically disprove each of the alternatives. What survives, the hypothesis that resists disproof in this Darwinian selection among "multiple working hypotheses," has a much better chance of being the right answer than if you had simply run with the first idea that caught your fancy.

Checklist: Carl Sagan (Baloney Detection)

5. Try not to get overly attached to a hypothesis just because it's yours. It's only a way station in the pursuit of knowledge. Ask yourself why you like the idea. Compare it fairly with the alternatives. See if you can find reasons for rejecting it. If you don't, others will.

6. Quantify. If whatever it is you're explaining has some measure, some numerical quantity attached to it, you'll be much better able to discriminate among competing hypotheses. What is vague and qualitative is open to many explanations. Of course there are truths to be sought in the many qualitative issues we are obliged to confront, but finding *them* is more challenging.

Checklist: Carl Sagan (Baloney Detection)

7. If there's a chain of argument, every link in the chain must work (including the premise) — not just most of them.

8. Occam's Razor. This convenient rule-of-thumb urges us when faced with two hypotheses that explain the data equally well to choose the simpler.

Checklist: Carl Sagan (Baloney Detection)

9. Always ask whether the hypothesis can be, at least in principle, falsified. Propositions that are untestable, unfalsifiable are not worth much. Consider the grand idea that our Universe and everything in it is just an elementary particle — an electron, say — in a much bigger Cosmos. But if we can never acquire information from outside our Universe, is not the idea incapable of disproof? You must be able to check assertions out. Inveterate skeptics must be given the chance to follow your reasoning, to duplicate your experiments and see if they get the same result.

New Era: Movement investing

- Many Tesla customers became die-hard investors
- People who love the mission become die-hard investors
- It‘s a community, a religion, a cult
- „Be on the right side of history“
- David vs. Goliath

Wall Street Doesn‘t Understand Tesla

- Most analysts have no experience with the product
- Wall Street doesn‘t understand disruption
- Wall Street doesn‘t understand long-term visionaries and owner-operators like Jeff Bezos or Elon Musk
- Tesla is misunderstood, similar to Amazon

How to Understand Tesla

- Rent a Tesla for a weekend (or better a week/month)
- Go deep into the Tesla community (Twitter, YouTube, Reddit)
- Retail investors have a better grasp than professional analysts

Risks

Key Person Risk

- If Elon Musk disappears tomorrow, the long-term thesis gets substantially weaker

- Major projects might get delayed or fall apart
  - Full Self-Driving
  - Robotaxis
  - Pace of Innovation
  - Culture / management style might get weaker

Execution Risk

- Not able to scale to >10M vehicles per year
- Not able to achieve Full Self-Driving
- Not able to lower prices enough to achieve wide affordability
- Bloat / bureaucracy / bad mistakes

Operational Risks

- Bugs / Fleet-wide hack
- Sabotage
- Privacy / Security breaches
- Legal risks / major lawsuits

Regulatory Risks

- Not able to get approval for Full Self-Driving
- Regulation / Break-up of company
- Losing ability to operate in China / India

Summary

- The perfect storm to disrupt old auto is here
  - Shift to sustainable energy
  - Fixing air pollution
  - Shift to 100% electric
  - Shift to autonomy

- Tesla is positioned perfectly
  - Mission first company
  - World-class execution
  - Extreme ambition

Summary

- Major risks
  - Key person risk
  - Execution risks
  - Operational risks
  - Regulatory risks

- Good upside for long-term investors:
  - Revenue: $895 billion in 2030
  - Valuation of $2.7 to $6.7 trillion in 2030

Summary

- Upside
  - Shares outstanding (fully diluted): ~1.3 billion (in 2030)
  - Current market cap (fully diluted): $1.02 billion (Feb 21)

  = 2.7 to 6.7x Upside in 10 Years

  = 10% to 21% compounded per year (CAGR)

Next Actions

- **Subscribe** to my channel to receive all future updates (https://www.youtube.com/c/remouherek)
- Help me spread the word by **liking** and **sharing** this video
- Let me know your thoughts in the **comments**
- Do your own research before investing

Thank you