CBINSIGHTS

The Race For The Electric Car

2019

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Electric vehicle sales are growing quickly, yet they still only account for a small fraction of the cars on the road. But that could soon change. We look at the global EV landscape, barriers to adoption, and the brands to watch.

The race for the electric car is on.

Ever since the 2008 release of the Tesla Roadster — the first mass-produced highway-legal electric vehicle (EV) powered by a lithium-ion battery — automakers, from General Motors to Toyota, have been rushing to launch their own electric cars.

Technical limitations, production challenges, and consumer uncertainty have all had a role to play in hampering the industry's development. But with technical capabilities improving, production costs trending down, and a societal-wide demand for sustainable solutions, the EV's moment may have arrived.

EVs are becoming more competitive. Median electric car range has increased 171% in 7 years, from 73 miles in 2011 to 125 miles in 2018, according to the US Department of Energy. While the median cost of electric car batteries has dropped significantly in the same time frame, from $800 per kilowatt hour in 2011 to $209 per kilowatt hour in 2017, according to a Bloomberg survey. These advances are translating into sales: in 2011 global EV sales reportedly reached just 50,000 units; by 2018, electric vehicle sales had increased 40x to surpass 2M units.

The race is unfolding on a global scale, with startups and incumbent brands alike all jockeying for market share and seeking to secure their place.

Below, we look at how the race is unfolding: where the market is currently, the major contenders, how EV adoption is evolving in various markets, and the consumer concerns and technical challenges that need to be addressed for the technology to achieve widespread adoption.

Why the electric car?

The mounting interest in electric vehicle technology is underpinned by a combination of environmental, socio-political, and economic forces. These 3 factors are driving significant support for electric vehicle adoption at the governmental level, with federal and local governments in numerous countries instituting policies to incentivize EV adoption.

Concern about climate change is at an all-time high, and the impact of fossil fuels, and hence internal combustion engine (ICE) vehicles, are front and center in the global climate conversation. The transportation sector — including cars, trucks, ships, trains, and airplanes — generated 29% of US greenhouse gas emissions in 2017, according to the EPA, the largest share of any industry.

Electric vehicles are increasingly viewed as a way to help mitigate climate change. In a 2018 Consumer Reports survey, 80% of those who intend to make an EV their next vehicle purchase cited environmental concerns as their primary motivator.

But environmental impact is not the only factor contributing to electric vehicle adoption. Socio-political considerations arising from dependence on oil, which many countries import in large quantities, also play a role. Passenger vehicles accounted for about one-quarter of global oil demand in 2016, according to Columbia University's Center on Global Energy Policy. Further, in 2017, the US imported about 19% of the petroleum it consumed, according to the US Department of Energy. Greater adoption of EVs could help change this dynamic and potentially give countries like the US more space for maneuver in regards to foreign policy — an attractive proposition for many decision makers.

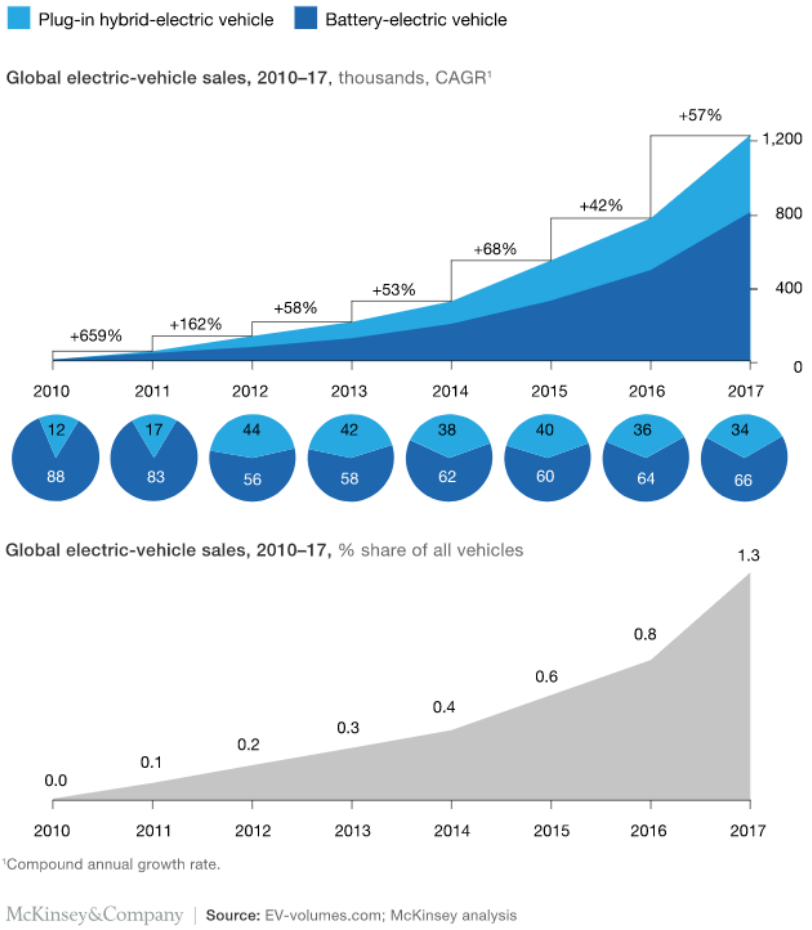
Finally, there are the economic considerations. The shift to more sustainable transport could save governments, companies, and individuals up to $70T by 2050, according to an analysis by the International Energy Agency. The US Department of Labor estimates that electric vehicle manufacturing alone could result in a net employment gain of up to 350,000 US jobs by 2030.

As a result of these environmental, political, and economic incentives, federal and local governments in major markets around the world are introducing policies aimed at discouraging fuel-burning cars and boosting the use of EVs. In the US, for example, EV buyers can receive a tax credit worth $2,500-$7,500, while Germany's federal government has allocated a fund worth around $670M for electric vehicle subsidies. On a local level, at least 15 major cities worldwide have announced plans to limit gas-powered cars by 2030 or sooner.

The social, environmental, and political considerations pushing EV adoption will likely grow stronger in the coming years, but how is this alignment translating into EV sales?

Where the EV market is now

The electric vehicle market has been growing steadily, reporting growth rates of 50% or more most years since 2010. But 50% growth relative to a not-very-big number is still a not-very-big number, and the EV industry has a long way to go to challenge internal combustion engine vehicles for dominance on the road.

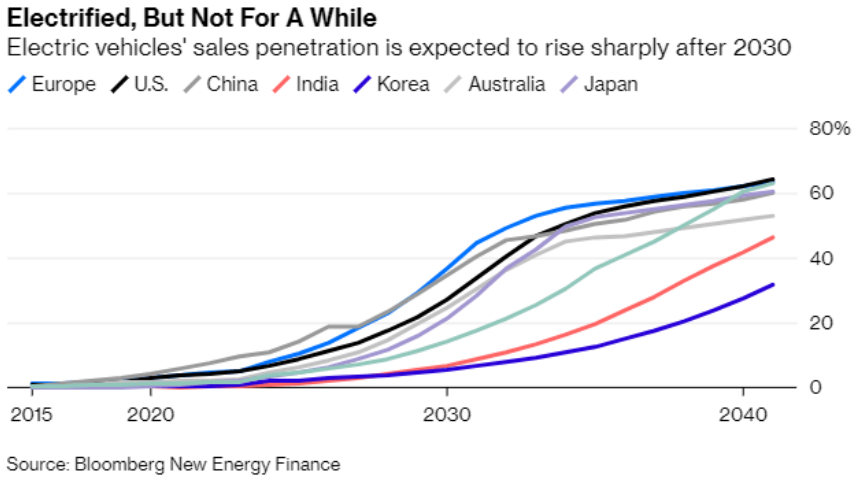


EV sales have increased steadily year-on-year since 2010. But as a percentage of overall vehicle sales, EVs are still a small percentage of the overall market at 1.3%. Image source: McKinsey

Consumer interest in electric vehicles is growing as well. A 2018 survey by AAA found that about 20% of Americans say they're likely to buy an electric car in the future — up from 15% the year prior. Interest in electric vehicles is significantly higher in other markets: In Europe, the number is 40-60%. In China, it's around 70%. Consumers under the age of 50 and those living in cities are particularly likely to report plans to make the switch to electric.

The upward trajectory seems likely to continue. McKinsey projects more than 350 new EV models debuting by 2025 — which it notes as one of the conditions for mass-market adoption.

As impressive as the growth of the EV sector has been, it's important to maintain a sense of proportion when considering EVs within the broader automotive industry.



Electric vehicle sales are projected to pick up the pace after 2030.
Image source: Bloomberg

Currently, only around one in 250 cars on the road is electric, and EVs currently account for less than 5% of new sales in most markets. While growth is expected to accelerate, by 2040, electric vehicles are still expected to only make up a third of global cars and around half of new car sales.

As a percentage of total annual sales and vehicles on the road, EV's share is low and looks set to remain so for some time.

Global landscape: The race for sustainable tech

Consumer interest and adoption of electric vehicles are growing, but that doesn't mean growth is equal in all markets. Across the three most prominent EV markets — China, Europe, and the US — EV adoption is taking shape differently, largely due to variations in how EV adoption is being prioritized.

CHINA

China has made no secret of its desire to become a leader in electric vehicle technology.

China is already leading global EV sales, accounting for more than half of the 1.1M EVs sold in 2017. But China's lead in the EV adoption race is expected to narrow in the coming years as sales elsewhere ramp up.

China has employed a two-pronged approach to incentivize EV adoption: 1) offering subsidies for EV buyers and 2) mandating that car companies acquire a certain number of credits for the sale of EVs.

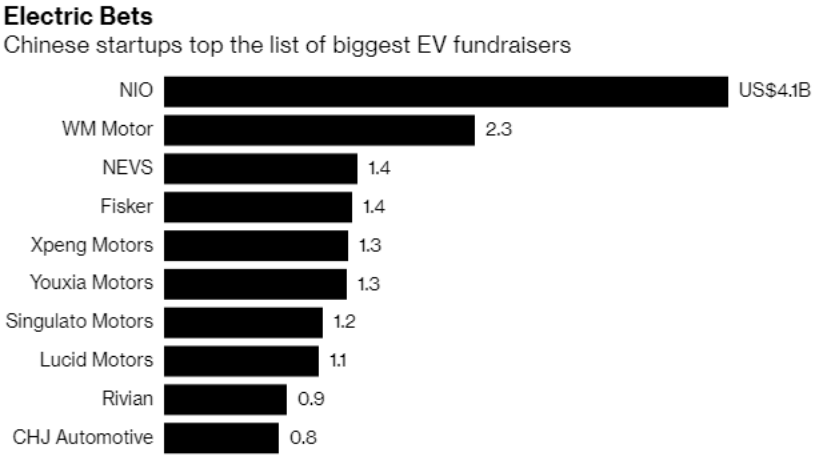
However, China's government recently announced plans to drastically cut the amount of the subsidies, and phase them out all together by 2020. The decision stems from concerns that the Chinese EV industry has become too dependent on the subsidies — making automakers complacent and hurting the rate of technological innovation in the country.

It's true that China's domestic EV technological capabilities have been called into question. Batteries produced in China have reportedly performed poorly at low temperatures, and companies have experienced other manufacturing issues as well.

However, there are signs that may be changing.

For instance, investors put nearly $8B in funding into Chinese EV startups in 2018.

Additionally, automakers from other regions are setting their sights on the Chinese market: Nissan is exploring potential investments in Chinese EV startups, while Toyota made a deal with startup Singulato to sell its EV technology to the Chinese company.



Chinese EV startups are disproportionately represented in a ranking of top EV fundraisers. Image source: Bloomberg

Some Chinese EV companies are already drawing global attention.

China's state-owned automaker BAIC Group had the second best selling EV model in the world in 2018, only behind Tesla's Model 3, according to EV Volumes.

Another Chinese EV manufacturer, NIO, is already trading publicly on the New York Stock Exchange. NIO currently has 3 EV models.

Chinese EV startup BYTON has raised $800M in disclosed funding at a valuation of $2.2B and plans to release 3 electric car models by 2022.

EUROPE

Adoption of EVs has been strong in Europe, thanks in large part to governmental support and incentives. In 2018, the European passenger plug-in market grew 33% to 409,000 deliveries — putting it in a distant second to China in EV sales.

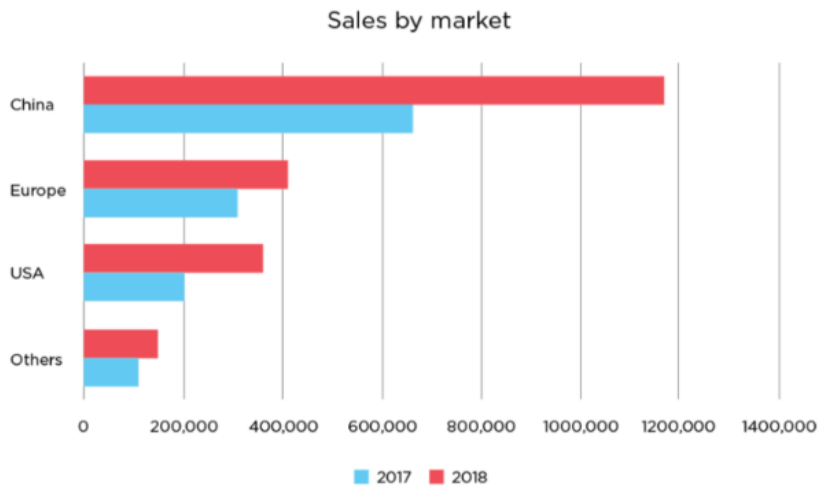


Image source: CleanTechnica

European countries are employing a variety of policies to incentivize EV adoption. The UK imposes additional taxes on diesel vehicles. In Germany, individual cities are permitted to ban diesel vehicles altogether, and several cities — including Frankfurt, Munich, and Berlin — have already banned older diesel models that burn fuel less efficiently. Norway, the UK, France, and the Netherlands have announced plans to ban the sale of vehicles that run on conventional gas and diesel fuel over the next two to three decades.

European countries lead the pack in terms of global EV adoption measured by market share of new car sales. In Norway, EVs represented 39% of new car sales in 2017. Iceland came in second at 11.7% and Sweden third with 6.3%.

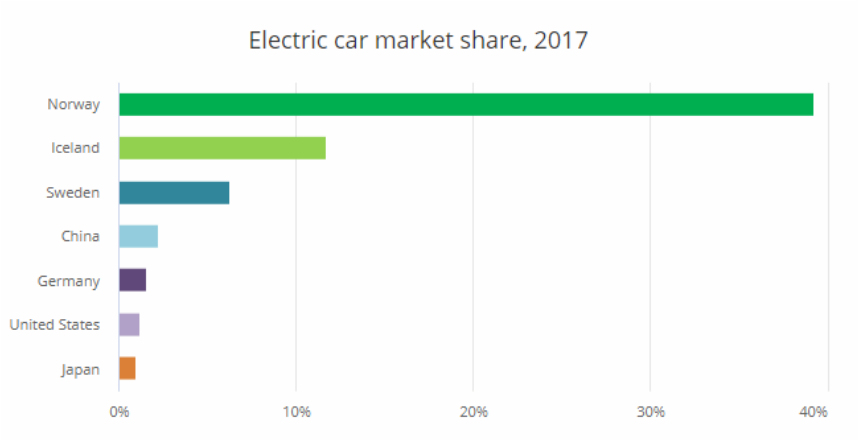


Image source: International Energy Agency (IEA)

Europe's most established automotive brands are investing substantial resources into integrating EV technology into their portfolios.

BMW has said it will invest millions in revamping its factory in Dingolfing, Germany, to produce advanced battery packs for its electric fleet. The company plans to introduce 12 all-electric models by 2025.

Volkswagen has announced a $50B investment in electric, self-driving, and other advanced technologies, and opened preorders for its first long-range electric vehicle, the ID.3, in May 2019.

Daimler also opened preorders for its first EV model, the Mercedes EQC, in May 2019. The company recently placed a $23B battery order for EVs.

UNITED STATES

The US may be home to one of the most prominent EV companies in the world — Tesla — but it has been the slowest of all the major markets to adopt EV technology. Less than 2% of the more than 17M new American car purchases in 2017 were plug-in hybrid electric vehicles or battery electric vehicles.

That said, EV adoption in the US is growing — 2018 sales increased by 75%.

One factor that has stymied EV adoption in the US is fuel costs — gas is relatively cheap. Oil prices are lower in the United States than in other major EV markets — $1.35/gallon cheaper than in China, and more than $3/gallon cheaper than in many European countries, according to Statista.

The switch to green technology has also been a contentious subject in the political arena in the US, with little consensus on how (and whether) EV adoption should be incentivized at a governmental level. For instance, carbon emissions guidelines issued by the Obama administration were rolled back under President Trump.

How EV adoption is promoted at a governmental level could have major implications for consumer adoption. For example, a March 2018 opinion poll conducted by Autolist found that 74% of consumers said that a tax credit would affect their decision to buy an EV.

However, slow EV adoption hasn't prevented US-based automakers from asserting their place in the EV market.

Tesla has long been the brand most closely associated with EVs and its vehicles are mostly well-regarded. The 2019 Tesla Model 3 earned a rating of 8.9/10 from the US News and World Report, giving it the number one spot in the publication's ranking of luxury small cars. Even dogged by production and logistics issues, the Tesla Model 3 was still the top-selling EV of 2018 with 138,000 units sold.

Automaker incumbent GM is investing heavily in the development of its EV platform, putting $300M into a Detroit assembly plant in preparation for bringing a promised 20 EV models to market by 2023.

Ford, meanwhile, has said it is investing $11B into electric vehicle technology, with plans to introduce 40 EV models by the end of 2022.

Fiat Chrysler Automobiles (FCA), another incumbent, recently announced a proposed merger with France's Renault — a move which may help it better compete on EVs, an area where it is considered to have lagged its peers.

Barriers to adoption: Consumer & manufacturer challenges

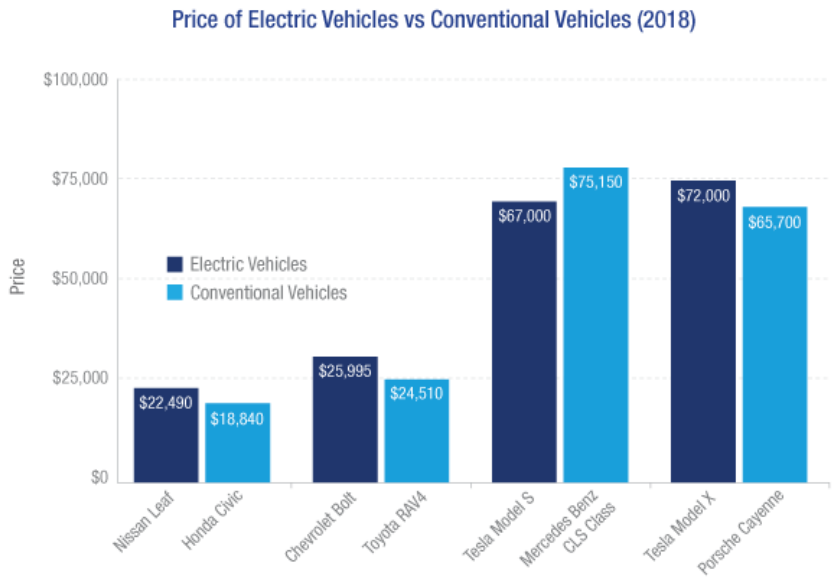
Global consumer interest in EV technology is growing — but there are a few major concerns the industry will need to alleviate before electric vehicles can become truly mainstream — chief among them: cost, performance limitations, and lack of infrastructure.

COST

The cost premium associated with owning an EV compared with an ICE (internal combustion engine) vehicle has long been a sticking point for consumers. But prices are becoming more competitive, largely due to improvements in battery technology bringing costs down significantly. The upfront cost is not the only, or even the most useful, metric when evaluating EV affordability. In some other metrics — such as total cost of ownership — EVs are already coming out ahead. But with upfront cost still posing a barrier to wider EV adoption, this concern will be a key priority for manufacturers to address.

It's true that electric vehicles have historically come at a cost premium compared with gas-burning alternatives. Even as recently as 2017, two of the three top-selling EV models cost over $80,000 — way outside the budget of many car buyers.

That cost premium has proven to be a stumbling block for consumers. In a 2018 survey conducted by McKinsey, more than 60% of respondents said they would not pay a premium for an EV, while over 30% of respondents in the same survey said that EVs should be cheaper than regular cars.

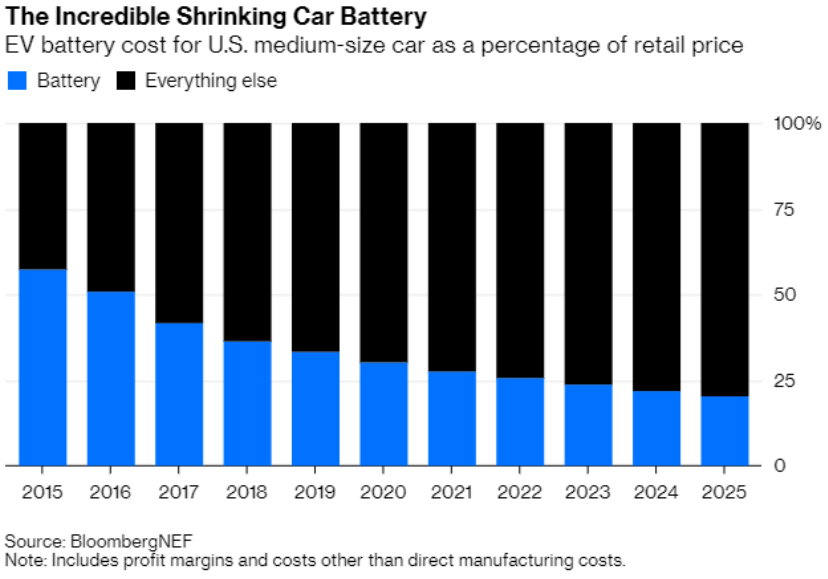


Electric vehicles continue to lag behind comparable fuel-burning cars in terms of upfront affordability. Image source: Energy Sage

The cost barrier is reflected in the demographic data on EV buyers. According to a UBS survey of around 10,000 people in the 6 largest auto markets, the households most likely to buy a battery-powered electric car have an income over $300,000 — a group that accounts for just 3% of the US population, according to CNN. Move even slightly down the income ladder to those earning between $150,000 and $200,000 and the number of households that say they plan to make an EV their next car purchase drops to 41%. And US households earning $150,000 per year or more account for 15% of homes, leaving the majority of consumers priced out of the EV revolution — for now.

The most significant cost center in EV production has been the battery. But battery prices have dropped by more than 80% since 2010, from $1,000 per kilowatt-hour (kWh) to $209 per kWh. In 2015, the battery made up more than 57% of the total cost of a mid-size EV sedan in the US. In 2019, that number is around 33%, and by 2025, the battery is projected to only be 20% of the total vehicle cost.

The general industry consensus is that EVs will reach price parity with ICE vehicles (without considering any tax incentives) once battery pack prices fall to below $100/kWh. While there is a range of opinion as to when price parity will be reached — some put it as close as 2021, while others propose a more conservative 2025 — it appears highly likely that the moment will arrive within the coming decade.



Car battery as a percentage of overall EV cost is on the decline, on pace to drop below 25% by 2025. Image source: Bloomberg

The moment that EVs reach price parity with ICE vehicles in terms of the upfront cost may well signal the end of mainstream ICE vehicle ownership. When you look beyond upfront cost to the total cost of owning the vehicle, EVs already come out ahead.

Electric vehicles are estimated to cost less than half as much to operate as their gas-powered counterparts: $1,117 for an average US gas-powered car vs. $485 for an EV, according to a 2018 study by the University of Michigan

And those savings matter to consumers. In a survey conducted by Consumer Reports, 66% of prospective EV buyers said that long-term cost savings would influence their purchasing decision.

PERFORMANCE LIMITATIONS

The price tag is not the only consideration giving would-be electric vehicle buyers pause. There are also concerns about EV performance and practicability. Essentially, the question is: are EVs ready to live up to the everyday needs of the typical driver?

The answer, as of right now, is probably not. But evidence suggests that may soon change — again, thanks to improvements in EV battery technology which are steadily boosting the capabilities of EVs.

Concerns about EV performance are concentrated on two main areas: **Battery charge time** and **driving range**.

A typical fuel-burning sedan can travel 400-600 miles before needing a refill, which takes around 10 minutes at a gas station. Electric vehicles have a ways to go before they can mount a head-to-head challenge on either score.

The median range for all-electric vehicles in the US in 2018 is just 125 miles — a fraction of the range of many ICE vehicles — though some EV models offer significantly better range. Charging times for electric vehicles currently range from less than 30 minutes to 20 hours or more, depending on the type of charger used as well as the battery in question. The typical time to a full charge among top-selling EV models is between 7-12 hours.

But there are indications that these limitations in performance are temporary. The median electric car range increased by 56% in the 6 years from 2011 to 2017, from 73 miles to 114 miles, according to the US Department of Energy. As of 2019, there are 8 different EV models on the market that can drive 200+ miles before needing to recharge. More broadly, US electric car range is expected to average 275 miles by 2025, and hit 400 miles by 2028, according to an analysis by CleanTechnica. The time taken to reach an 80% charge is expected to be reduced to 30 minutes — the threshold that many consumers consider acceptable according to market research — by 2025.

LACK OF INFRASTRUCTURE

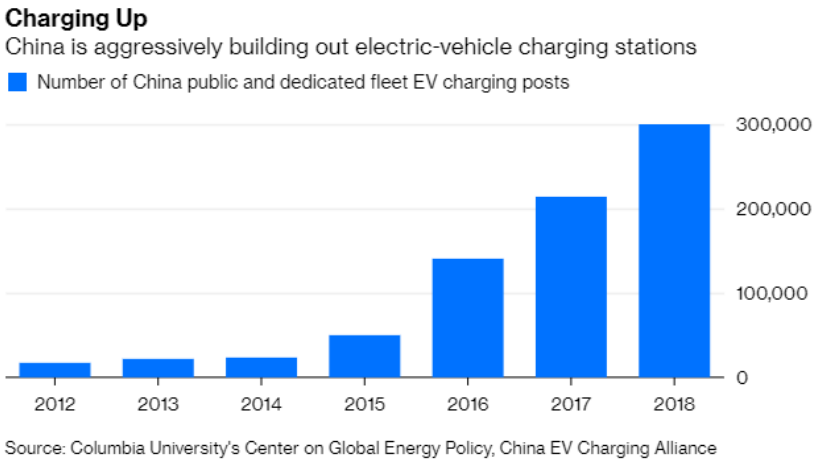
The highest-performing electric vehicle with the longest range won't get very far without stations to charge it or garages to repair it. This brings us to the next ongoing challenge confronting the EV space: infrastructure.

Until now, infrastructure has posed something of a chicken-and-egg problem for the EV industry. Fifty-eight percent of Americans who are either unlikely or unsure about buying an electric vehicle cited “not enough places to charge” as a concern, according to the 2019 AAA survey on EV adoption.

But before businesses invest in the necessary infrastructure, they want to see a critical mass of electric vehicles on the road.

An estimated $6T in investments is needed to build the infrastructure that electric cars need, including charging stations and power networks, according to Goldman Sachs.

Currently, there are approximately 632,000 public charging stations around the world serving a global electric fleet of around 5M vehicles. About half of those stations are located in China. The International Energy Agency projects a need for as many as 30M public chargers to serve passenger vehicles worldwide by 2030.



China has significantly ramped up the availability of charging stations in the country. Image source: Bloomberg

There's also the question of charger interoperability. Tesla, for instance, has notably built out a network of proprietary "superchargers" that are only compatible with Tesla vehicles. While company officials have discussed opening up its network to other automakers, that hasn't happened yet.

Perhaps realizing that the lack of EV infrastructure today will impede their ability to sell EVs tomorrow, a number of major automotive companies have announced plans to invest in charging infrastructure.

Volkswagen, Daimler, Ford Motor Co., and BMW have announced plans to build a total of 400 charging stations across Europe by next year. Meanwhile, Volkswagen's Electrify America unit plans to spend $2B supporting zero-emission vehicles in the US, including $800M in California alone.

PRODUCTION STRATEGY

Manufacturing electric cars at scale is just as crucial as the quality and performance of the individual vehicle. Here again, manufacturers will need to address challenges and obstacles before the EV market can take off.

Because automotive incumbents already have infrastructure in place, they have a distinct advantage over startups when it comes to production strategy. Their challenge is to revamp their operations to produce electric vehicles in high volumes, reinforcing barriers to entry for tech companies and startups.

One major challenge facing manufacturers is inventory management. Deloitte expects 21M battery electric vehicles will roll off assembly lines over the next decade, as EV prices fall below comparable gasoline and diesel models. However, consumer demand may take a while to catch up. Analysts predict a global over-supply of 14M electric cars by 2030.

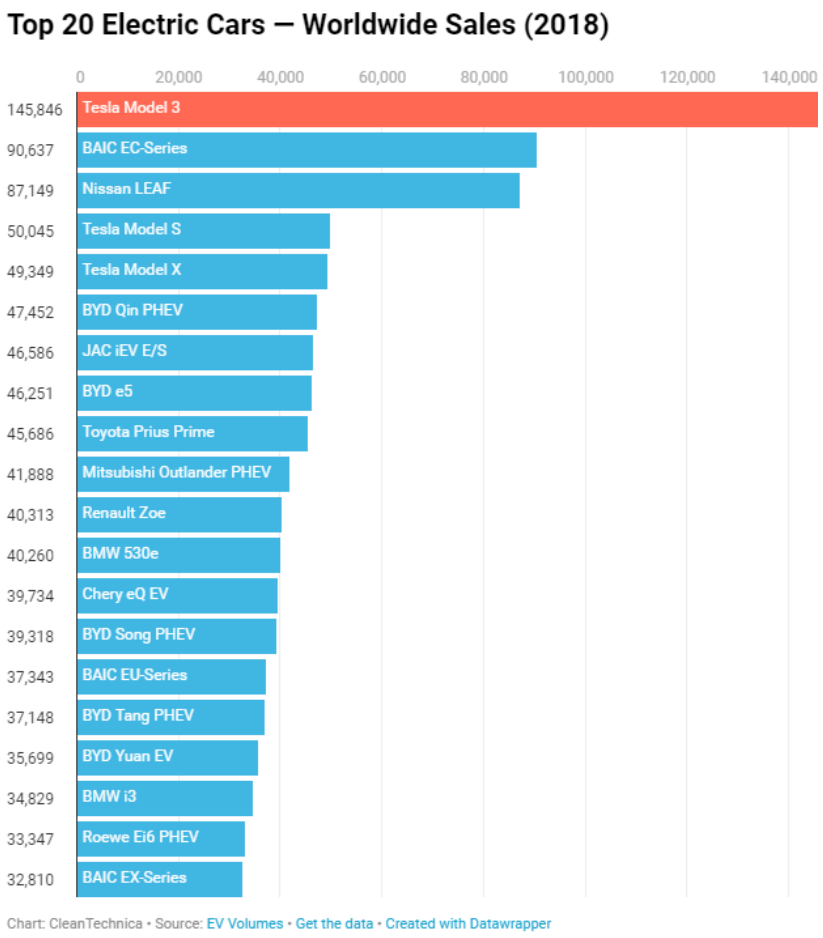
Manufacturers are already taking measures to better navigate this challenge. Brands like BMW and Jaguar Land Rover are implementing flexible manufacturing platforms that allow them to manufacture conventional, hybrid, or electric engines from the same platform.

With demand for EVs progressing at different rates in different markets, this production strategy gives auto manufacturers more flexibility to scale production to match demand.

Brands to watch

While a number of automotive incumbents have thrown their hats into the EV ring — including Ford, Honda, and BMW — three main companies lead the pack: Tesla, Nissan, and the Chinese government-owned BAIC.

Together, these companies accounted for roughly a quarter of the 2M+ electric vehicles sold in 2018.



The list of the top 20 best-selling EVs of 2018 is topped by the Tesla Model 3, BAIC EC-Series, and Nissan LEAF. Image source: CleanTechnica

But the market is about to get more crowded. OEMs launched approximately 100 new EV models in 2018 alone, according to McKinsey.

Automotive incumbents including GM, BMW, Volkswagen, and Daimler are all ramping up their own EV operations with millions — and even billions — of dollars in investments in production and battery technology.

And startups haven't ceded the territory. Dozens of insurgent companies are rising up to challenge the incumbents — with mixed results.

American market leaders

TESLA

Tesla has dominated the EV conversation, thanks in large part to an aspirational brand and a prominent — if sometimes polarizing — founder.

But while the company's technical expertise has yet to be rivaled, manufacturing challenges and a high price point present barriers to undisputed global EV dominance.

Tesla's cars accounted for 79% of pure electric vehicle sales in 2018, according to Edmunds. The company reported it sold almost 146,000 Tesla Model 3s worldwide in 2018 — more than any other plug-in vehicle in a single year ever. Cumulative sales surpassed 500,000 units at the end of last year.

Tesla is widely considered to be technologically superior to other models, particularly in terms of range. The Tesla Model 3 has a range of 325 miles, while the latest Model S is capable of a maximum of 370 miles — more than double the current median EV range of 125 miles, and significantly more than the 2019 Nissan LEAF's 226 miles and the Chevy Bolt's 238 miles.

Tesla's Model X SUV is a crossover cousin to the Model S sedan. Image source: Flickr

But producing Tesla's cars is another story.

Founder and CEO Elon Musk has touted the importance of "the machine that builds the machine." He has also stated that "the competitive strength of Tesla, long-term, is not going to be the car. It's going to be the factory." But the Tesla factory has been beset by manufacturing challenges, which Musk memorably referred to as "production hell."

Logistics and delivery have posed a similar challenge for the company. In April 2019, Tesla reported an unprofitable quarter due in large part to the company's difficulties in getting cars to customers.

NISSAN

In 2018, Nissan became the first EV manufacturer to break 400,000 in sales with its flagship EV, the Nissan LEAF.

Billed as the world's first mass-market electric vehicle, the LEAF provided an option for early adopters who were willing to work with a shorter range and a limited charging infrastructure. Over the years, however, the LEAF has evolved into a mainstream car that can easily handle typical city driving.

The Nissan LEAF was an early effort for a more affordable EV option.
Image source: Flickr

The LEAF has outlived a number of models that were introduced around the same time, including the Ford Focus Electric, Honda Fit EV, and Chevrolet Spark EV — all of which have been phased out of production.

The LEAF has undergone substantial improvements in range over time, though like other brands it still lags significantly behind Tesla. The original LEAF, which was introduced in late 2010, had a range of just 73 EPA-rated miles (118 km) with its 24-kWh battery fully charged. The 2019 LEAF has a range of 150 miles. In 2019, Nissan introduced a new premium LEAF model, the LEAF PLUS, with an EPA range of up to 226 miles.

Nissan is poised to expand its EV footprint. In April 2019, the company announced plans for a new EV model under its premium Infiniti brand. The company has said that beginning in 2021, every new Infiniti model launched will be either an all-electric car or an "e-Power" hybrid.

GENERAL MOTORS

General Motors is also investing heavily in EV innovation.

In 2018, GM became the second automaker in the United States to hit the 200,000 cumulative electric vehicles sales mark with the Chevy Bolt. The 200,000 milestone is significant because it triggers a phaseout in the $7,500 federal tax credit.

The 2019 Bolt has a range of 238 miles and starts at $36,620, putting it on the more affordable end of the EV spectrum.

Image source: Wikimedia

GM has laid out an aggressive electric vehicle strategy, vowing to bring at least 20 EV models to market by 2023. GM Chief Executive Mary Barra recently announced the company would invest $300M in a Detroit-based assembly plant, adding 400 jobs to build a new Chevrolet EV based on the Bolt platform.

GM has yet to turn a profit on electric vehicle sales — Barra said during an earnings call that she expects it to reach profitability "early next decade."

German OEMs

BMW

BMW plans to introduce 12 all-electric models by 2025.The first of the company's entries, the i3, is already available. The i3 retails for $44,450 and has a relatively short range of 153 miles.

BMW recently announced a plan to expand its factory in Dingolfing, Germany, to produce its fifth-generation battery packs — a project estimated to cost around $56M. It is also investing in a battery supplier system that could produce new cells from those recycled from old BMW battery packs.

The automaker is also embracing flexible manufacturing methods that enable vehicles to be built as gasoline, hybrid, plug-in hybrid, or fully electric. Starting in 2021, all new BMW platforms will be built to accommodate a combustion engine, plug-in hybrid, or pure electric powertrain.

DAIMLER

In December 2018, Daimler placed a $23B order for EV batteries. The automaker expects battery-electric cars to account for 15-25% of global sales by 2025.

The company announced in May 2019 that it was accepting purchase orders for its long-range Mercedes-Benz EQC. Intended as a direct challenge to Tesla's dominance, the compact model will get roughly 270 miles per charge in European trim, and more in the US version.

Image source: Getty Images

Daimler plans to offer an electrified variant of every Mercedes model by 2022. This will include a mix of mild hybrids, plug-in hybrids, and 10+ models powered by either batteries or hydrogen fuel cells.

The company is recalibrating its EV strategy in some areas as well. In April 2019, Daimler announced that it will end sales of its Smart cars after the 2019 model year in the US and Canada, citing the declining micro-car market in North America.

But this doesn't mark the end for the quirky short-range vehicle. A month before announcing the sunsetting of the Smart brand in North America, Daimler announced a joint venture with Zhejiang Geely Holding Group to introduce Smart as an all-electric brand based in China. The vehicles will be assembled at a new factory in China, with global sales set to begin in 2022.

VOLKSWAGEN

Volkswagen's leap into the EV market comes in the aftermath of a scandal: in 2016, multiple VW executives — including former CEO Martin Winterkorn — were jailed or indicted after the company was revealed to have faked emissions reports for its gas-burning vehicles in Europe.

In November 2018, Volkswagen announced that it was investing $50B in electric, self-driving, and other advanced technologies in what CEO Herbert Diess referred to as an “electric offensive."

The automaker opened preorders for its first long-range vehicle, the ID.3, in May 2019. The model is expected to begin shipping in 2020 with prices starting at $33,000 and a range of 200-340 miles per charge.

The ID.3 will be the first car built on the Volkswagen Group's “modular electric toolkit" or “MEB" — a technological platform for EVs that includes the battery pack and motor. Using the MEB platform, Volkswagen parent company the VW Group plans to release 70 different electric models over the next decade, including the Audi E-Tron and Porsche Taycan.

Startup contenders

Incumbent automakers may have a head start in the EV race, but there are plenty of startup brands looking to catch up. There are over 50 electric vehicle startups worldwide, some focused on personal vehicles and others focused on commercial applications such as buses and trucks.

Lucid Motors has promised a $60,000 sedan, the Lucid Air, to compete with or exceed the specs of the Tesla Model S. The company has raised over $1B in funding from investors including the Public Investment Fund of Saudi Arabia, which it is using to prepare its California factory to start production next year.

Faraday Future made waves with some flashy Las Vegas unveilings, including its $260,000 FF91 SUV. But the company has struggled to attract investors for its factory amid layoffs, executive departures, and legal challenges.

Canoo (formerly Evelozcity) has announced that it will offer a range of EVs to private and commercial customers via a subscription model. The company is positioning itself as a "boutique California EV brand" and plans to start sales in the US in 2021, according to Reuters.

CHINA-BASED STARTUPS

As previously mentioned, Chinese EV startups raised over $8B in funding in 2018.

BYTON plans to start selling its first model M-Byte in China at the end of 2019 before expanding to North America and Europe by mid-2020. BYTON has raised $800M to date, with a $100M Series C round from undisclosed investors raised in May 2019.

WM Motor began selling its debut model, the EX5, in 2018. The company has announced plans to invest $685M to double production from 100,000 vehicles per year to 200,000 at its Wenzhou factory.

Singulato Motors plans to bring its first all-electric vehicle, the iS6 SUV, to market in 2019. Toyota has reportedly agreed to sell EV technology to Singulato to help it speed up development. The car will likely have a battery range of 250-300 km (160-190 miles) with a price tag of 100,000 yuan (about $15,000).

What does the future hold for the EV market?

The current state of the electric vehicle market is one of cautious optimism. The International Energy Agency predicts that global stock of electric cars will grow at a compounded annual growth rate of 33% from 3.1M units in 2017 to 125M by 2030. By 2040, 55% of all new car sales and 33% of the global fleet will be electric.

But much that will shape the future of the EV industry remains uncertain. Will government policy continue to shape a market that is favorable to EV adoption? Will EV prices trend down and technical capabilities trend up to achieve much-needed parity with fuel-burning cars?

And will Tesla, currently the market leader in EV technology and sales, be able to navigate its operational challenges well enough to maintain market dominance — or will the investments of incumbent OEMs and a growing crop of startups see their rise instead?

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