



The European EV Market

Europe

Global Markets Research Department
— February 2022

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The European EV Market

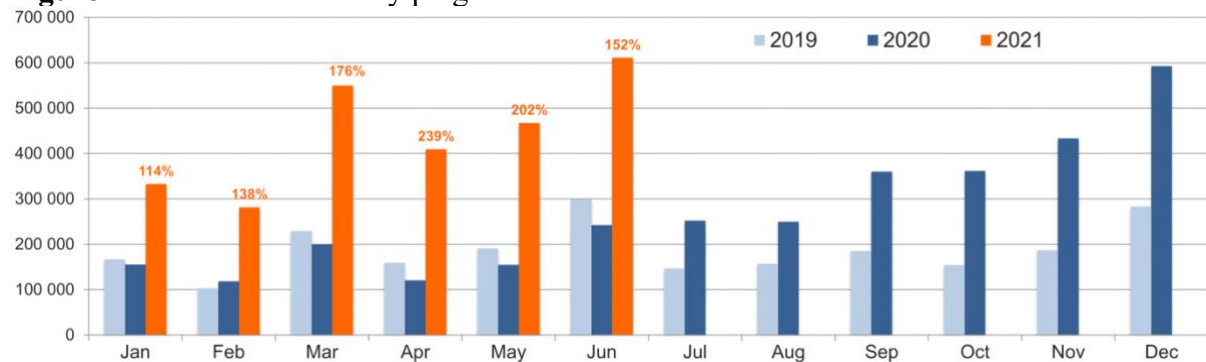
Section introduction

Experts agree that the global & European EV market is at a tipping point toward exponential growth, with sales likely to follow an S-curve trajectory. Investments in infrastructure, R&D, policy support, and coordinated global action will determine whether EVs can realize their full potential over the next 15 years.

General description

While the global vehicle market was significantly affected by the Covid-19 pandemic, remaining 28% below its 2019 H1, the global EV market was less severely hit, nonetheless declining by 14% over the same period (Irlé, 2021). This may be attributed to considerable EV subsidies and complementary taxes on conventional cars in some instances amongst large European economies (Miller & Campbell, 2021). These were especially effective in Germany, France, and the U.K., reflecting in penetration rates close to or above 20% (Figure 2), “a level that suggests it is winning over the pragmatic ‘early majority’” as Wilmot (2022) states.

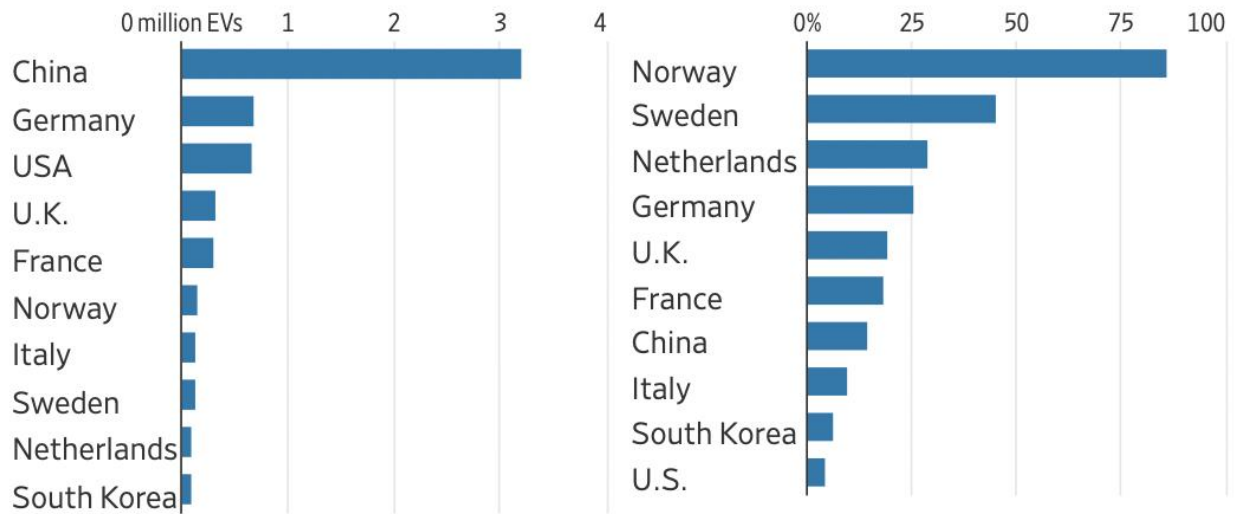
Figure 1: Global monthly plug-in vehicle sales



Source: Irlé, 2021.

Despite the pandemic, global markets have more than recovered, with 2,65 million new EVs distributed in the first half of 2021 which represents a 168% increase compared to 2020 H1, this figure should, however, be considered in the context of the low base for 2020 H1. Volumes and EV shares continued a similar trend through 2020 H2, encouraged by “attractive products, extensive green recovery funds and the 95g CO₂ mandate” (Irlé, 2021, para. 1).

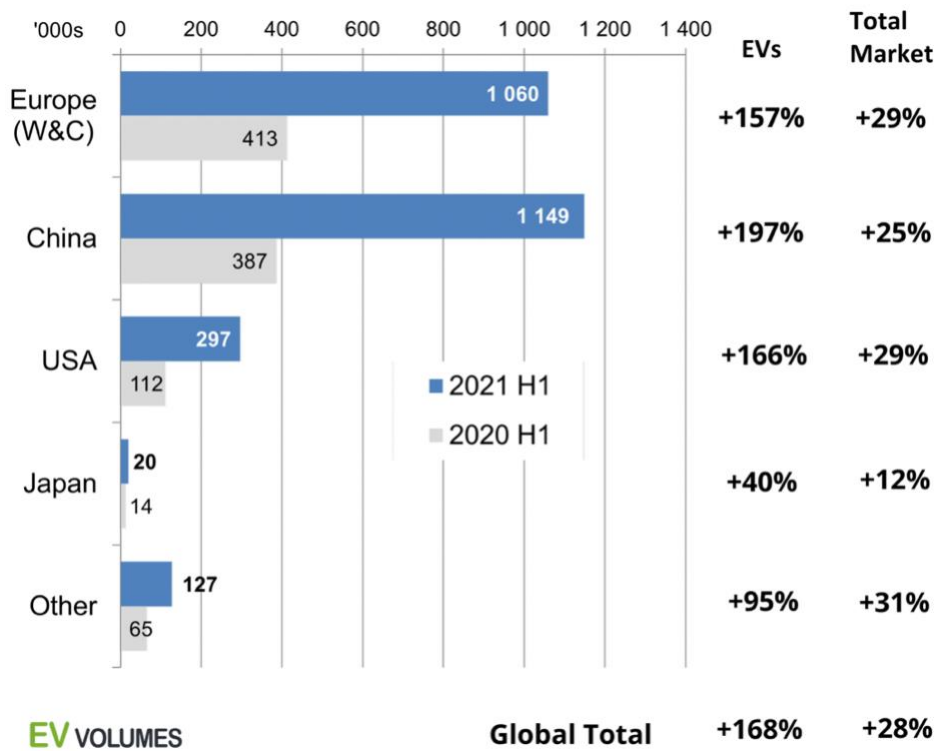
Figure 2: (a) Top 10 EV markets by vehicles sold in 2021 & (b) EV sales as a share of total passenger-vehicle sales in top 10 EV markets



Note. EVs include battery-electric cars and plug-in hybrids; Data are preliminary for China and the Netherlands
Source: Irle, 2021.

In 2021, global markets experienced a further strong increase in EV sales, with growth rates 3 to 8 times higher compared to the total light vehicle market. 2021 H1 sales have increased by 1,66 million units compared to 2020, while the light vehicle market gained 9,17 million units. Growth in Europe was 157%, again this should be considered in the context of the low sales base for the previous year. A similar gain in volume for EVs is predicted for 2021 H2 (Irle, 2021).

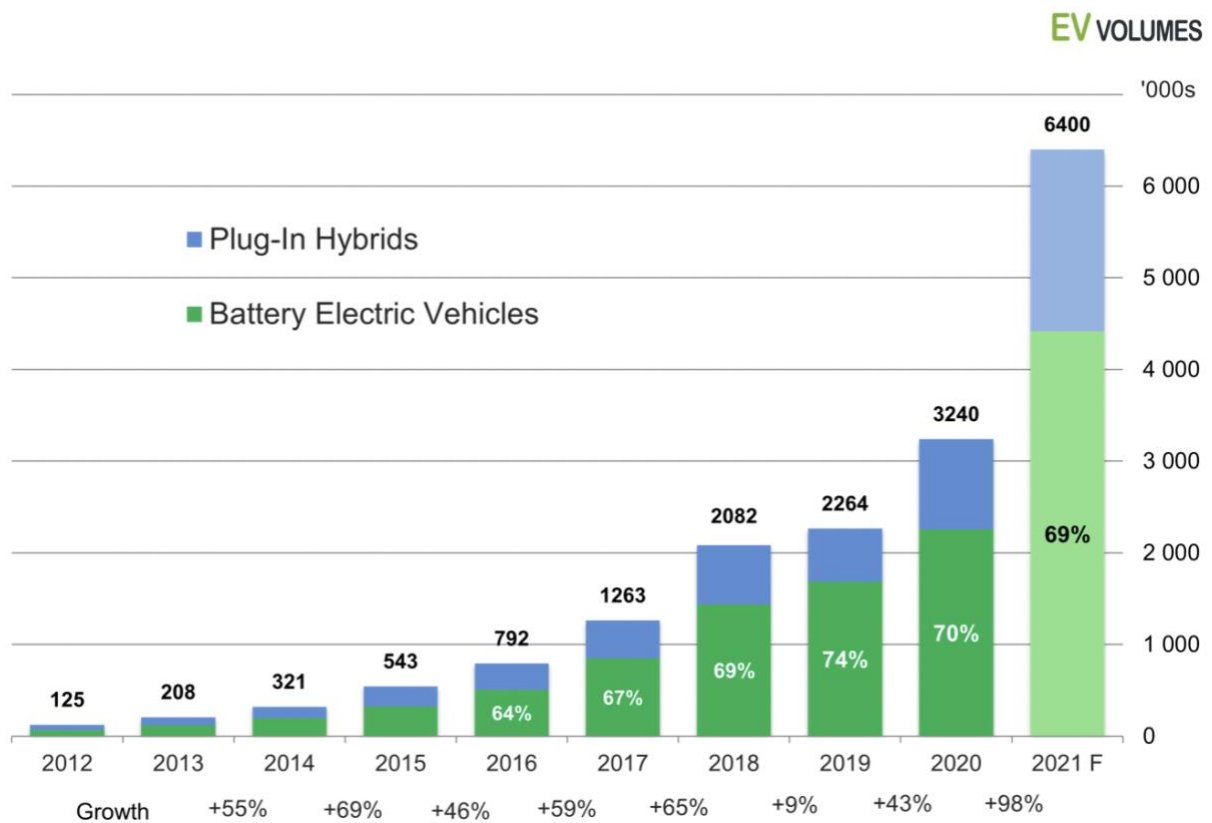
Figure 3: BEV+PHEV sales and % growth



Source: Irle, 2021.

The share of battery-electric vehicles (BEVs) and plug-in hybrid electric vehicles (BHEVs) in global light vehicle sales increased from 3% in 2020 H1 to 6.3% in 2021. The European market doubling its EV share from 7% to 14% year-on-year. In total 6.4 million new EV sales are expected for 2021, consisting of 4 million BEVs and 2.4 million PHEVs, totalling over 16 million EVs in operation. Growth was robust in all product segments but sportscars. A trend from “sedans and compacts into SUVs” can be observed (Irle, 2021, para. 3).

Figure 4: Global plug-in vehicle sales

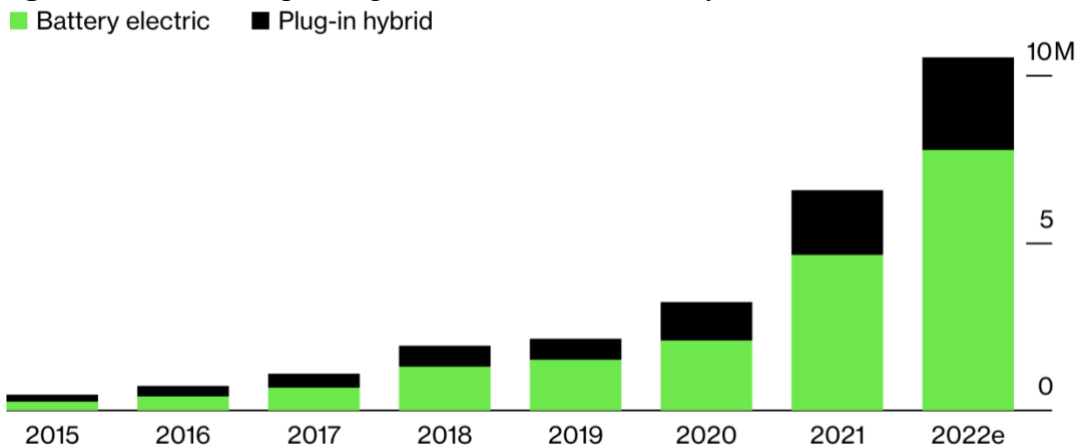


Source: Irle, 2021.

Tesla is the global leader in terms of EV sales through 2021 H1, having delivered 386,000 BEVs, second is the Volkswagen Group with 172,700 BEVs and 159,400 PHEVs, which is followed by General Motors with 221,000 BEVs and 6,000 PHEVs (Irle, 2021).

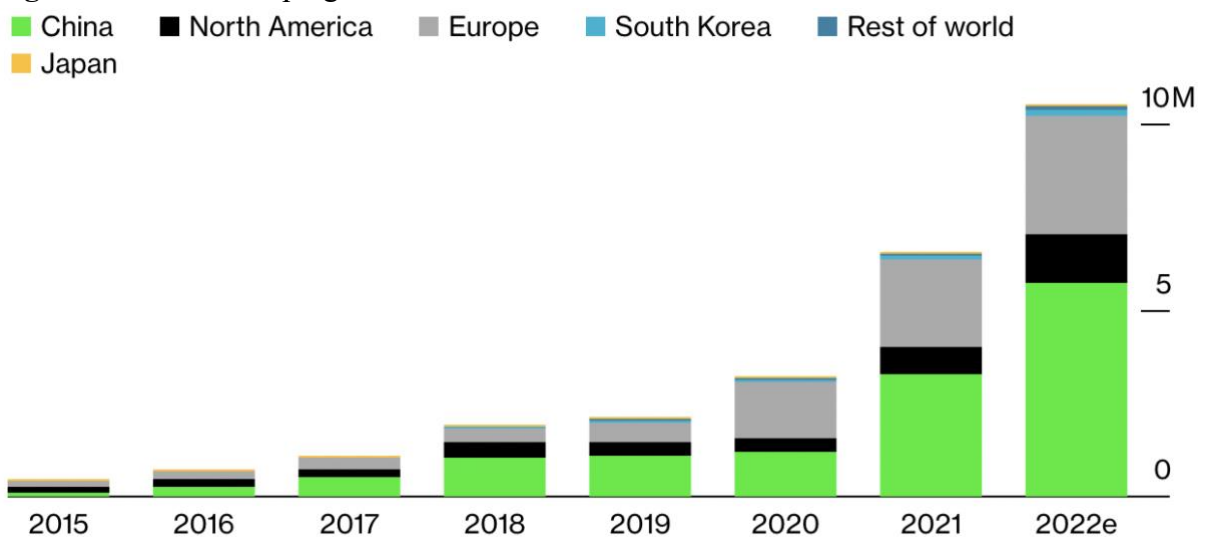
According to McKerracher (2022), global passenger electric vehicles sales are forecast at 10.5 million units for 2022 – 7.8 million BEVs and 2.8 million PHEVs (Figure 5), of which 3.2 million units are expected to be sold in Europe (Figure 6).

Figure 5: Global passenger electric vehicle sales by drivetrain



Source: McKerracher, 2022.

Figure 6: Global plug-in vehicle sales



Note: Includes BEVs and PHEVs.

Source: McKerracher, 2022.

Financial description

Subsidies aren't the single driver though, consumers are also motivated by rising climate concerns, and improved product performance. Tighter emissions rules in force since 2020 have also been a factor. The EU is proposing a 2035 de facto ban, while the UK plans to end the sale of petrol and diesel cars by 2035, compared to Norway that aims to achieve the transition 10 years earlier. Municipal authorities are also "pricing older cars off the roads with clean air zones" (Miller & Campbell, 2021, para. 27).

Tesla has been in the spotlight in recent times, having achieved great success and capturing a significant fraction of the EV market share. Notably, however, established

automakers have also undergone a transition of their own over the last two years. Many of the large players, including Toyota and Volkswagen, are now staking their future on EVs.

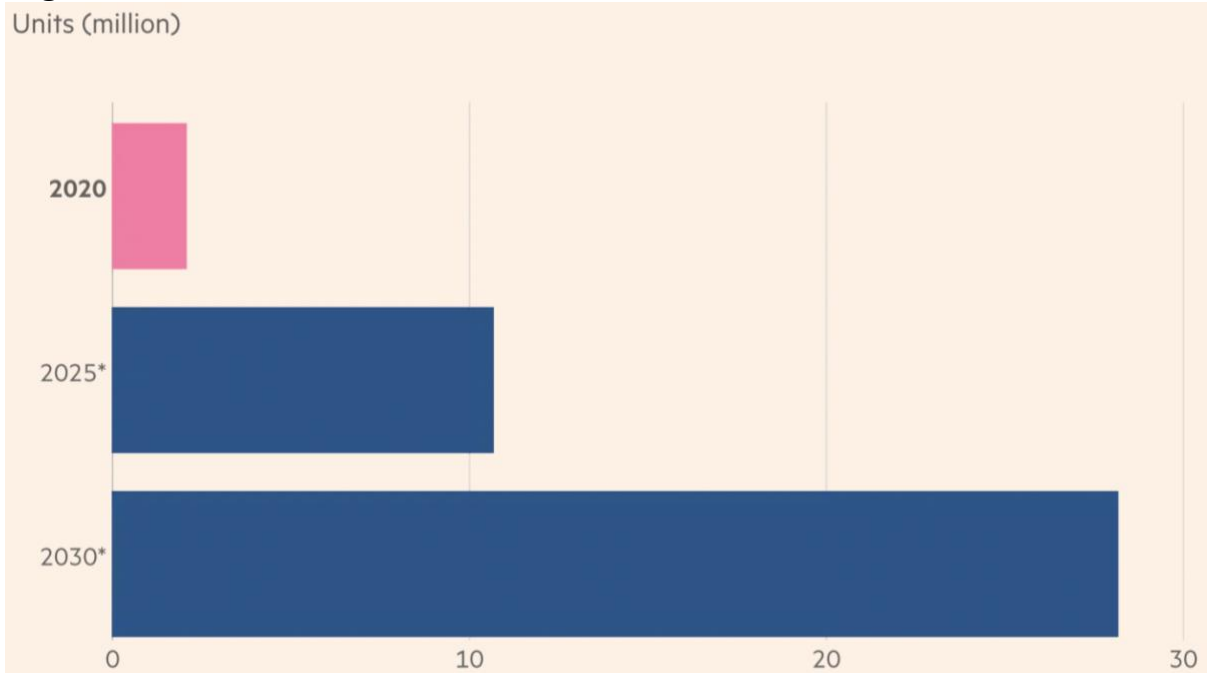
More than \$100bn in investments has been accumulated since the beginning of 2020, (McKinsey 2021, as cited in Miller & Campbell, 2021), additionally car manufacturers have announced they will investment further \$330bn into electric and battery technology over the next five years (AlixPartners 2021, as cited in Miller & Campbell, 2021). The European electric vehicle market is predicted to be worth \$1,300bn by 2028 (Meticulous Market Research, 2021). It is also worthwhile mentioning that while most carmakers cut spending on all but the most essential projects during the pandemic, spending on electric technology increased.

Figure 7: Tesla versus the rest



Source: Sentieo, 2021 as cited in Miller & Campbell, 2021.

Figure 8: Global electric vehicle sales are forecast to soar this decade



Source: BloombergNEF, 2021 as cited in Miller & Campbell, 2021.

Nonetheless, large players warn that moving too quickly risks alienating current customers who are unable or unwilling to undergo the shift: “If you say that 50 per cent of the market in Europe will be pure electric in 2030, there is still the other 50 per cent, and if you say you will not serve [this 50 per cent] you are setting yourself on a course to shrink,” (BMW’s chief executive Oliver Zipse, 2021, as cited in Miller & Campbell, 2021). Even though the EV market is booming in Europe it should not be forgotten that markets are still heavily dependent on subsidies.

Market entry

The barrier of entry for the EV industry is lower than for conventional cars. Electric vehicles are simpler to design and manufacture than conventional cars. An important question that remains is whether established firms can fend off young start-ups including Tesla, and more recent newcomers from China.

Although Tesla has only increased in strength over the past two years, developments by established car makers like Renault and Volkswagen have also been positive. Inter alia, they were able to address issues of limited range, and poor charging speeds. Newer models by large players are more competitive in terms of pricing, range, and performance. Initial problems will be resolved as the carmakers gain experience.

Figure 9: The world's biggest car companies



Source: LMC, 2021 as cited in Miller & Campbell, 2021.

Interestingly, several established players feel they are facing their ‘young’ competition with a disadvantage. New EV start-ups have managed to raise billions of funding and achieved considerable valuations, while established manufacturers trade at low earnings multiples. Take for example NIO (approximate market cap \$33bn), the start-up still making losses has a value similar to that of Ferrari (approximate market cap \$40bn), a major profit-generator. There are many more examples, inter alia, the British van group Arrival (approximate market cap \$2bn), or US electric pick-up truck producer Rivian (approximate market cap \$50bn), some of which have not yet tested or built vehicles.

Recently, however, established firms have begun to retaliate. Take for example, Polestar, the new electric brand supported by Volvo “will be valued at \$20bn when it floats through a reverse merger” (Miller & Campbell, 2021, para. 57). This is also reflected in the stock market, many of the established car manufacturers like Toyota (+18.05%), VW (+39.50%), Daimler (+23.49%), Ford (+131.41%), GM (+38.63%), and BMW (+26.37%) gained significantly over the past year, compared to several newcomers who have taken considerable hits, including Rivian (-57.77% since IPO), NIO (-36.11%), Nikola (-23.01%) and Arrival in 2021 (-44.09% since IPO). For reference take the iShares Electric Vehicles and Driving Technology UCITS ETF with a return of 16.85% in 2021.

Figure 10: iShares electric vehicles and driving technology UCITS ETF



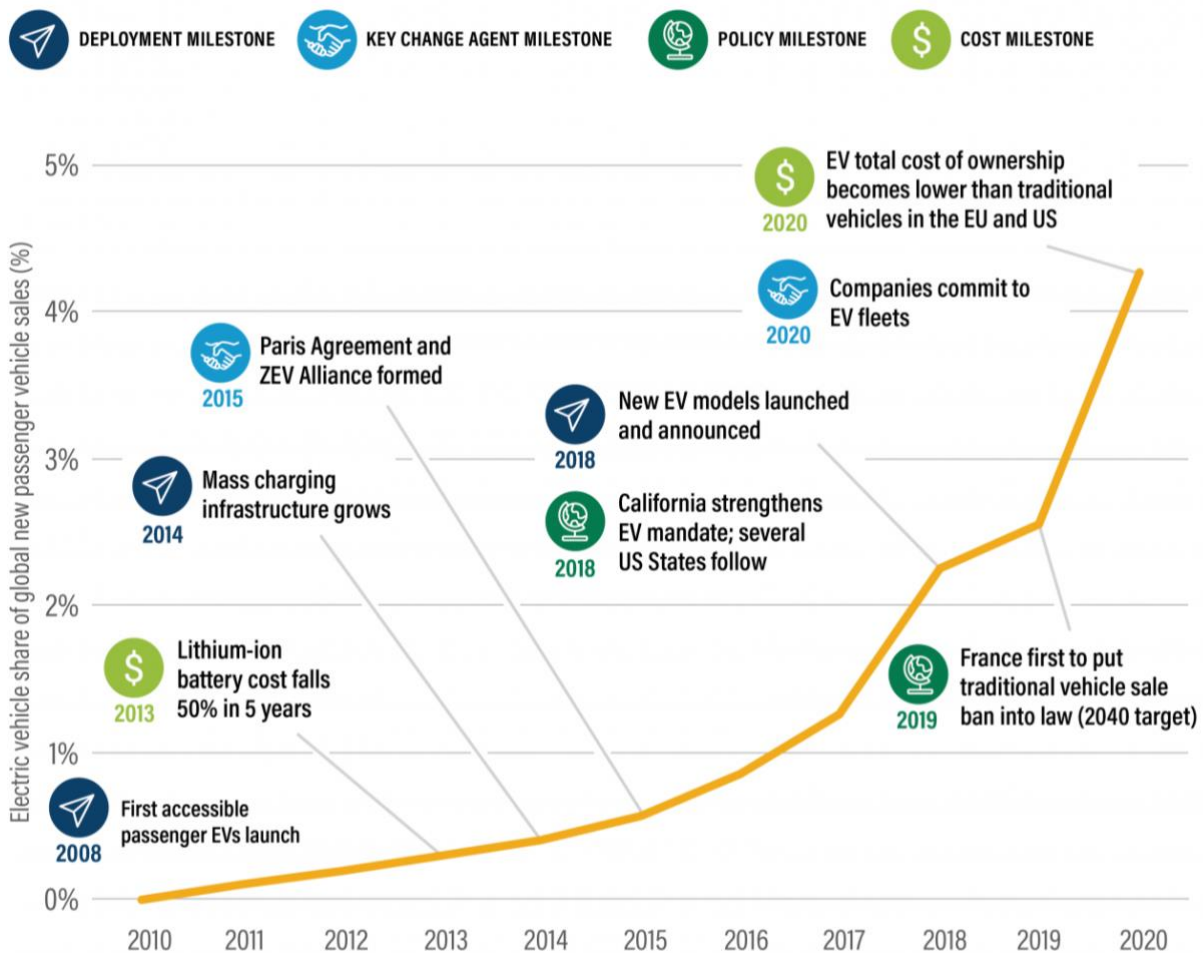
Source: Blackrock, 2022.

Outlook

Recent developments are promising, with many countries having made plans for a transition towards EVs. From a public perspective, the European Union has announced growingly ambitious targets, while established carmakers ranging from Volkswagen to Volvo pledged to “invest \$150 billion in EV manufacturing and announced plans to launch new EV models throughout the 2020s” (Dennis, 2021, para. 2). Dennis elaborates “[a]dditional action from public, private and civil society actors will be critical to increasing EV adoption globally. The 2020 Climate Action Tracker report [...] projects that to be aligned with the 1.5°C pathway, fully electric vehicles — including battery-electric and fuel cell vehicles — will need to account for 75-95% of global annual passenger vehicle sales by 2030 and 100% by 2035” (Dennis, 2021, para. 4). Dennis goes on to state that the target can lead to exponential growth throughout the 2020s under the right conditions.

EV adoption has experienced accelerated growth in recent years due to an accumulation of reasons, ranging from technological (battery) improvements, to supply and demand-side policies, to a better complementary (charging) infrastructure, falling prices due to lower battery costs and a greater range of models to choose from (Figure 11).

Figure 11: Key milestones in the exponential growth of electric vehicle sales



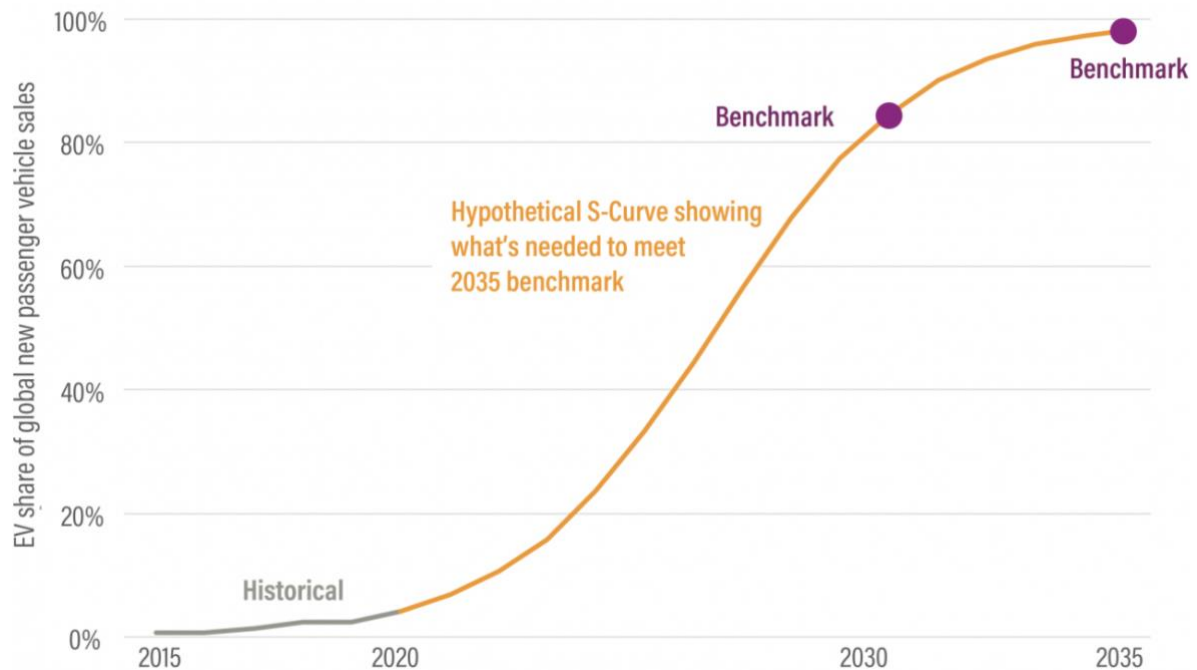
Source: Dennis, 2021.

The electric vehicle S-curve

Experts agree that EVs could experience a similar growth pattern to past value-creating technologies. They describe an S-Curve: when the technology is in its early stages, growth is slow, and uncertainty is high. Once, economies of scale kick in and the necessary environment/infrastructure is in place, costs fall and a ‘tipping point’ may be reached which causes exponential growth. This continues until the technology becomes dominant in the market, after which growth plateaus. Norway provides an example of what lies ahead. EV sales were encouraged via a range of incentives and grew to 54% of the market share in 2020 from below 1% in 2010 (Dennis, 2021). The EV market has come a long way since 2010, other countries may require fewer incentives to achieve the described tipping point and could potentially accelerate the process altogether. Sales are going in the right direction throughout Europe, however, “[i]nvestments in infrastructure and research and development, strong policy

support at national and municipal levels, and coordinated global action taken today will determine if EVs can reach their full potential in the next decade” (Dennis, 2021, para. 23).

Figure 12: Possible pathway for passenger electric vehicles to align with the 1.5 °C goal



Note. This S-curve illustrates what would need to happen for EV sales to reach the target of 100% EV sales by 2035.

Source: Dennis, 2021.

Financial implications

EV related stocks have exhibited volatile behaviour over recent months. While market newcomers quickly achieved considerable valuations, corrections have occurred in recent months. Contrarily, established carmakers have seen considerable gains on the stock market over the same period. Evidently, there exist a wide range of investment opportunities in the EV market, ranging from a bid on long term growth to short term opportunities caused by supply-chain bottlenecks and remaining areas that could still slow down adoption – like charging infrastructure and battery materials. The outlook in terms of charging is optimistic. Global public charging points are expected to number 2.7 million before 2023, an increase of 900,000 units over 2021. “A spate of company announcements will start to come to fruition this year, and those who were holding back installations while they waited for expected government funds will be actively working to take advantage of these new pots of money” (McKerracher, 2022, para. 9). Additionally, companies are working to advance consumer interface, payment options and reliability of charging points. The outlook in terms of batteries and raw-material

supplies is less optimistic. McKerracher (2022) anticipates that the supply of lithium and nickel will be tight, but there will be sufficient manufacturing capacity to meet sales forecasts for 2022. “The EV industry has grown accustomed to steady annual declines in the costs of battery packs. However, this decades-long trend could come to a halt in 2022 as the effect of rapidly rising raw material and component prices hit the auto sector” (McKerracher, 2022, para. 11) – volume-weighted average battery-pack prices are expected to increase by \$3/kWh to \$135/kWh in 2022. “The higher prices we expect to see in the battery industry in 2022 and 2023 could delay the point at which EVs start to reach price parity with traditional vehicles (starting around \$100/kWh) by two years, from 2024 to 2026. Even so, this is unlikely to reverse the rising tide of EV adoption” (McKerracher, 2022, para. 12). From a labour perspective, jobs will be created in the manufacturing of batteries and installation of charging infrastructure, totalling more than 4 million by 2025 as part of the EU’s Green Deal (Dennis, 2021).

From a long-term perspective, increasing EV sales alone will not suffice in achieving current climate targets. “Systemic changes to individual transport, such as rethinking in city planning and increasing public transport availability” (Dennis, 2021, para. 18) will provide investors and entrepreneurs with interesting opportunities. EV adoption is widely encouraged throughout Europe, for instance, 60% of new vehicles are purchased through corporate subsidy programs. Furthermore, France, Germany, Italy, Spain and others have integrated EV sales into covid stimulus measures by increasing or extending EV purchase subsidies and increasing traditional vehicle buy-back amounts. “The noticeable shift in focus to EV promotion is indicative of a larger sea change [...] [s]trategies like loan-loss guarantees, vouchers for low-income consumers, and instant rebates can help increase equity and ultimately the efficacy of purchase incentives” (Dennis, 2021, para. 23).

Governments are currently driving EV adoption. The outlook is positive, the downside is in component shortage and political and environmental reasons relating to sudden changes in regulation or business conditions, which should be considered by investors. Supply-chain bottlenecks, together with the unsubsidized cost of EVs could restrict the market to affluent consumers willing to pay a premium.

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