US electric car transition awaits the next wave

In the US, the uptake of electric cars has slowed while hybrids have gained ground. Battery EV prices resumed a downward trend, but remain high for the middle class. Meanwhile, charging concerns linger and production has been temporised. Policy support will be essential for next-level EV adoption, but upcoming elections could bring drastic changes

The US now lags behind China and Europe in electric vehicle adoption – and unlocking the second wave of adoption within the middle class will be essential if it wants to catch up any time soon

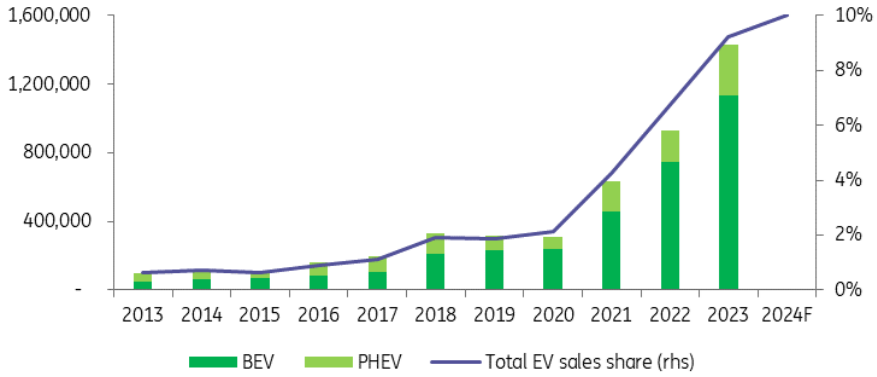
US EV sales share in 2024: still going higher but at a slower pace

The electrification of new cars is still progressing in the US. The electric vehicle (EV) sales volume hit 1.4m units in 2023, illustrating nearly a 50% of increase from sales in 2022. Total sales of EVs – including battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs) – climbed to a 9.2% of all new car sales in the US in 2023, compared to 6.7% in the previous year.

EV tax credits from the Inflation Reduction Act (IRA), funding from the Infrastructure, Investment and Jobs Act (IIJA) designed to ramp up charging infrastructure, and continuous lowering of prices from manufacturers have all contributed to getting the transition in the country started – but we're obviously not quite there yet.

US sales share to increase at a lower rate

US EV sales in absolute numbers and as a share of total light-duty vehicles

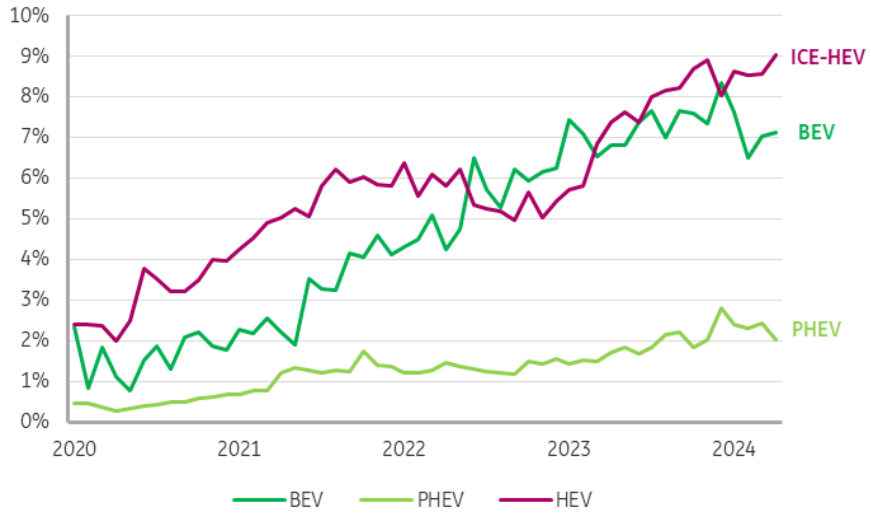


Source: Argonne National Laboratory, ING Research

We still expect the share of EV sales to set a new high at 10% in 2024, but this increase will not be as high as last year's. As we discuss below, the US is now seeing a new phase of the EV transition, with different client groups alongside other advanced economies in Europe. BEV penetration is facing some backlash, while PHEVs and especially traditional hybrids (without a plug) gain popularity as intermediate options.

Full electric sales growth falters, plug-in hybrids and traditional hybrids benefit

Share of electrified cars (hybrid electric vehicle without plug: HEV, battery electric vehicle: BEV, plug-in hybrid electric vehicle: PHEV in total new registrations



Source: Argonne National Laboratory, ING Research

Definitions of electric and hybrid vehicles

Vehicle type	Categorized as EVs?	Definition
Electric vehicles (EVs)	Yes	Vehicles that have a battery instead of a gasoline tank, and an electric motor instead of an internal combustion engine.
Plug-in hybrid electric vehicles (PHEVs)	Yes	A combination of gasoline and electric vehicles, PHEVs have a battery, an electric motor, a gasoline tank, and an internal combustion engine (ICE). PHEVs are charged primarily by plugging it to a power source.
Hybrid electric vehicles (HEVs)	No	HEVs are also powered by an ICE with one or more electric motors that use energy stored in batteries. In contrast to PHEVs, HEVs are primarily charged through the ICE.

Source: US Environmental Protection Agency, US Department of Energy, ING Research

New EV prices have resumed downward trend, but face headwinds

New EV prices went up during the pandemic, when production saw a squeeze and consumers turned to used cars as an alternative. Today, production constraints have softened, most raw material prices have retreated from peaks, and backlogs have disappeared. These dynamics created a turning point and have forced manufacturers to provide more competitive pricing.

The downward trend of EV prices was challenged by spiking battery material prices following sanctions on Russia. However, the market rebalanced and prices resumed their downward trend in 2024. Mounting competition is also providing an extra weight on prices. Tesla, eager to fill production lines and keep pushing production figures up, has cut prices for its model Y several times, and this has been followed by competitors. As a result, BEV prices dropped to an average of $55,167 in 2024, a 3.8% decrease from the fourth quarter of 2023 and a 9% drop from the first quarter of 2023. This puts BEVs prices $6,904 higher than the average light-duty vehicle prices.

But, as discussed below, the push for volume and remarketing of used rental cars also sent residual values of battery EVs down.

Importance of policy support continues for EV uptake

EV sales in the US have gone through a phase of acceleration on the back of policy support. The EV tax credits under the IRA remain an important incentive for both battery and electric plug-in hybrid car purchasing. With declining EV prices, the IRA's EV tax credits can put the cost of EVs closer to par with fossil fuel cars. Admittedly, the new tax credit requirement regarding foreign entities of concern brings down the number of eligible models from more than 20 to just over 10 and excludes a range of foreign built EVs. But that would not cancel out the positive impact of the IRA. Another attractive factor for buyers is that they can now get advanced payment of the tax credits at the time of purchase, as opposed to file for tax returns later on.

But a new wave of EV adoption requires buy-in from the middle class

Still, the growth momentum of EV demand is becoming softer, even with tax credits and lower prices. This is because of the persisting challenge of the charging infrastructure, as well as the often long distances combined with a sticky consumer preference towards fossil fuel cars in the US and relatively low petrol prices in some states. Today, the first wave of EV adoption is coming to an end.

Early adopting (urban area) consumers with higher purchasing power, access to private charging facilities, as well as a willingness to drive EVs have largely made their purchases. Demand saturation from first-adopters and insufficient infrastructure mean that the US now lags behind China and Europe in EV adoption. The key now is to unlock the second wave of adoption within the middle class, as well as consumers in relatively lower income brackets in an environment of significantly higher borrowing rates for consumers.

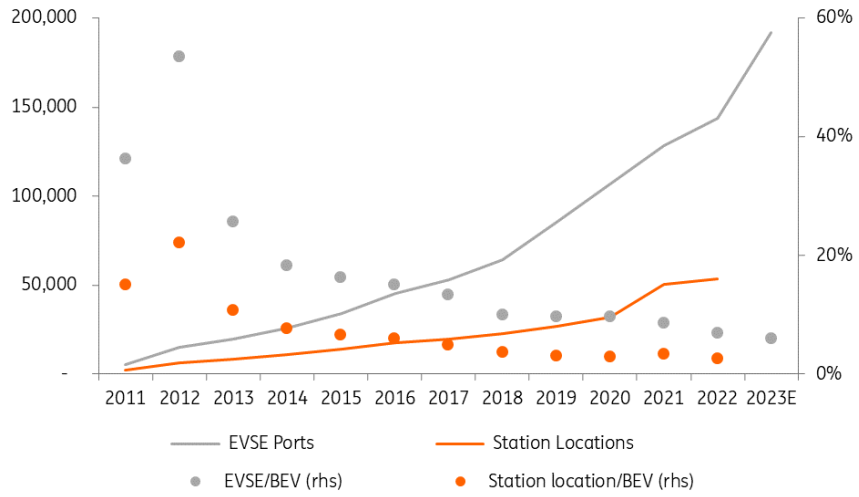
EV charging infrastructure needs an extra push

EV charging infrastructure has long been a bottleneck to faster EV development in the US. The IIJA is, in part, designed to address that problem, with $5bn dedicated to developing the National Electric Vehicle Infrastructure (NEVI) network. So far, the flow of the $5bn funding to projects has been slow. This is largely because of strict contracting and charger performance requirements, as well as a lack of expertise from state and local governments in handling such a new programme. Moreover, the EV charging industry still faces the challenge of low profitability, partly because of mild electricity demand from EV consumers and low utilisation rates.

Consequently, the share of electric vehicle supply equipment (EVSE) ports as a percentage of EV stock has dropped over the past decade. This indicates that the EV infrastructure has not been increasing fast enough to match the increase of EV sales in the country.

EV chargers are increasing in the US, but the share per EV is decreasing

Number of EV charging facilities (lhs) and share per EV (rhs)



Note: One charging station may have multiple charging ports, and each charging port can have one or more connectors. Source: Alternative Fuels Data Center, ING Research

It has therefore become more crucial for federal funding to be used faster. This includes up-skilling government officials on EV charging and investing in charging performance improvement, among others. And there is hope here. Even with only 4% of the $5bn of funding awarded, there have already been more than 250 charging sites having received funding, which is also attracting more

private sector investment.

Last year, Tesla announced the opening up of its supercharging infrastructure to non-Tesla brands. The announcement has triggered major car manufacturers in the US, such as Mazda, Stellantis, and Volkswagen Group of America (Audi, Porsche, Scout Motors, and Volkswagen) to produce EVs with built-in connectors that are aligned with Tesla's North American Charging Standard (NACS) starting the 2025 model year. This will largely enhance the flexibility and accessibility of fast EV charging. While there is now uncertainty surrounding the operations of Tesla's supercharging network, EV manufacturers' strategies have not changed course. And the increase in numbers charging offerings from other companies can make the US EV charging market more diverse.

Stronger consumer bet on the intermediate HEVs and PHEVs

The electrification of the US automotive industry has reached different consumer groups – including those in less urbanised areas and those who still have the EV 'driving range anxiety'. This means the charging infrastructure is getting more important, but as discussed above, the roll-out rate remains insufficient. This has become an increasingly important condition for battery EV adoption, and the sales of PHEVs and HEVs are benefiting from this constraint. And fuel economy improvement of regular hybrids also attracts consumers as step in the right direction without losing flexibility. While the sales share of BEVs has slid since 2024, the sales share of HEVs has significantly improved since 2023 and the sales share of PHEVs has also slightly increased (please see chart in the first section).

With distance and infrastructure remaining a concern for US consumers, hybrid vehicles will be an intermediate option for many car drivers. The increasing popularity of hybrid vehicles slows electrification as HEVs still run on gasoline. But the adoption of HEVs at least helps to improve fuel efficiency among fossil fuel-based cars in general. As such, US market leader Toyota still pushes hybrids.

Hybrids have a wide and increasing range which applies to customers

The biggest criticism from an emissions perspective for hybrid vehicles is the limited electric driving range in practice. The average electric driving range for a PHEV is 20-40 miles. But a positive aspect is that with advancing technology, top-range PHEVs have reached 50 miles, and a range of 60 miles is in sight. 60 miles is still low, but it can certainly help in urban areas. And for consumers, it's attractive that combined ranges reach far beyond 500 miles and continue rising.

Ups and downs of the second hand EV market

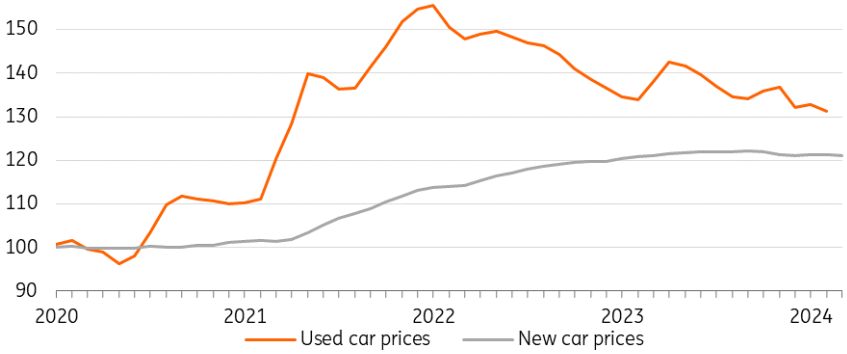
The second hand and leasing market is important in boosting the demand for EVs, but it has been going through substantial challenges. Multiple price cuts from EV manufacturers and higher-than-expected repair costs have largely led to a fall in EV residual values. In fact, while second hand car prices have generally dropped by around a fifth from peak levels, second hand EV prices in the US reduced by 32% this year compared to 2023. A large portion of new cars in the US, especially battery EVs, are financed via private leases. Leasing companies are revising down residual values, which has led to higher monthly payments. And a wave of returning vehicles in a continued push for technological improvement continues to weigh on prices.

Because of these factors, companies such as Hertz and Sixt have made a U-turn in their strategies

and slowed down in electrifying the leasing fleet. Unpredictable residual values and higher interest costs weigh on lease terms, which can soften the demand for EVs. But lower new prices can eventually also benefit the competitive position of EVs, and attractive used prices can lure in new consumers. Gradually, more affordable EV models will enter the market in the years to come, making EVs a more cost-competitive option in the long term.

Used car prices significantly in decline from elevated levels - but new prices have also slipped, especially for EVs

New and used car & light truck prices in the US



Source: St. Louis FED, ING Research, last data point March

Manufacturers are reconsidering EV strategies

Since late 2023, major car manufacturers in the US – including Ford and GM – have announced that they'd be pushing back EV production or investment targets as they face cost, profitability, and demand challenges. Ford, for example, has recently announced a scaling back of its EV production and cutting of battery orders, after announcing a pause in its $12bn investment in EVs last year. Ford remains committed to electrifying its fleet in the long term, as evidenced by its plans to build more manufacturing and assembly facilities. But while price cuts have effectively helped Ford to increase sales, consequent losses have made the manufacturer rethink its strategy. GM has also been tackling cost challenges, which has led to production target adjustments despite a continued commitment to the goal of electrifying its entire product range by 2035. Recently, the Biden administration also adopted looser-than-proposed vehicle tailpipe emissions rules, which would lead to a slowdown in meeting the US's EV sales target by the end of the decade.

Many manufacturers, including Ford, GM, Hyundai, Kia, and Toyota, have also been expanding their offerings of PHEVs and HEVs. This is indicative that hybrid cars are more profitable than BEVs at this point, and that car manufacturers are shifting strategies to match the current EV trend.

US elections – a wild card for the EV industry

As analysed previously, the US EV industry received a significant boost under the Biden administration thanks to the IRA and the IIJA, as well as the recent tailpipe emissions standards from the Environmental Protection Agency (EPA) that encourage the switch from fossil cars to EVs.

But the upcoming US elections could disrupt EV policy consistency. A second-term Trump

administration would not stifle the US EV industry, but would slow down the speed of development. Former president Donald Trump has publicly expressed negative views towards the industry and suggested policy reversals if elected. And among other clean energies and technologies, the EV industry is one of the most at risk.

- EV tax credits – high impact: First, despite a likely survival of the IRA, EV tax credits are likely to be squeezed, if not cancelled. Furthermore, given the bipartisan support on technology and manufacturing onshoring, the eligibility requirements for EV tax credits could grow stricter, especially on the aspect of domestic content and foreign entities of concern.
- IIJA funding for EV infrastructure – high impact: The $5bn funding for the NEVI program may be squeezed to a smaller amount in a scenario with full Republican control of Congress; the funding might be completely rolled back. Moreover, efforts to speed up implementation will be considerably slowed down, leading to longer funding application and approval times.
- Vehicle emissions standards – high impact: It is almost certain that the already-softened EPA's rule on vehicle emissions standards will be reversed under a Republican administration that favours gasoline.

In the case of a second-term Biden presidency, the administration will try to expand its green effort towards accelerating EV adoption in the US. But EV tax credit eligibility requirements on domestic content will remain strict, as indicated above. Moreover, the magnitude of support for the EV industry could become smaller – albeit against Biden's will – under more serious debt challenges.

States will play a larger role in the potential federal policy retreat. For instance, California, a climate legislation pioneer, has one of the highest taxes on gasoline among US states.

More challenges for EVs in international trade

Electrification of transport will rely on global trade, but trade will face intensified barriers. The US is pushing to scale the EV supply chain. But with abundant raw materials (refining facilities), low labour costs and production capacity as well as government support, China will continue to dominate the global EV supply chain and end products. The country also has ambitious expansion plans into regions such as Europe and Latin America.

China's domination has alarmed governments and caused them to take protective trade measures. In the US, President Joe Biden announced in May tariff hikes on imported Chinese goods, including EVs, batteries, and selected rare earth metals. The US tariffs could also have repercussions elsewhere, such as Europe. Europe has been investigating into the Chinese-exported EVs (such as BYDs) and a tariff hike could substantially affect both the European and Chinese markets.

The tariffs on EVs will have a limited impact on the US market, as Chinese carmakers altogether accounted for far less than 5% of the EVs sold in the US last year. But higher tariffs on lithium-ion batteries, critical minerals, and semiconductors as well as potential retaliatory measures in this field could have a larger impact, since many manufacturers still rely on imported Chinese supplies. Less competition could strengthen domestic EV production in the US, but it could also delay the transition to EVs and prevent consumers from more affordable cars. Even at 100%, there may still be inflow of Chinese cars as the price gap of models offered domestically and abroad is significant.

Moreover, Chinese EV manufacturers may expand manufacturing in other countries (such

Southeast Asia and Mexico), reroute trade routes, and eventually get their products into the US. In such a context, EV manufacturers in the US have been exploring and would continue to benefit from strategic partnerships along the supply chain to make it stronger and more secure. Whether that partnership can exist comfortably with Chinese firms, however, remains uncertain.

Authors

Coco Zhang
ESG Research
coco.zhang@ing.com

Rico Luman
Senior Sector Economist
Rico.Luman@ing.com