

Growing demand for electric cars – German exports are also picking up

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The global market share of electric vehicles (EVs) has more than doubled in the past three years. One in every five new cars was already electric in 2024. In Germany, the numbers decreased in the years 2023 and 2024 but now the trend is pointing upwards again.

The share of EVs in German car exports has also grown. Today, some 27% of exported cars are all-electric. In the first quarter of 2025, 82,000 battery-electric vehicles (BEVs) worth EUR 3.4 billion were exported on average each month. Germany now generates a higher export surplus with BEVs than with other cars. The value of exports of BEVs surpassed the value of imports by a factor of 5. For petrol cars, that ratio is currently around 2.5. Based on export value, half the exports of BEVs went to the EU, followed by the US and the United Kingdom, which are also important sales regions.

Climate-benefits of electric vehicles increase. Last year, one third of the electricity used to charge EVs in Germany was self-generated and green – more than ever before.

Households now have fewer concerns about electric vehicles. In the KfW Energy Transition Barometer, the purchase price was mentioned most often as a barrier, followed by concerns around the charging infrastructure and range. The safety of EVs was the only concern that increased slightly.

Various approaches exist to support the market ramp-up of electric cars. These include removing information deficits, providing incentives for time-optimised charging and creating simplified rules for installing charging points for households in multi-family homes.

Electric mobility is a global growth market

Electric cars are the primary key to decarbonising motorised individual transport. There is little doubt that they are the next technological step to reducing greenhouse gas emissions in the transport sector. This is also reflected in the number of new registrations around the world.

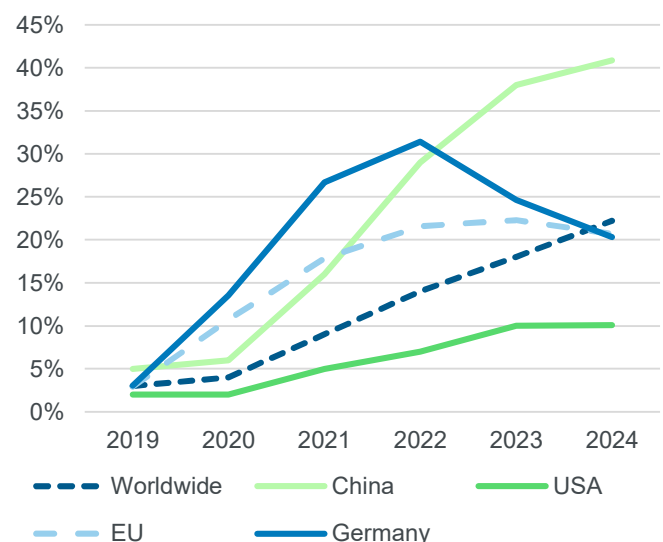
Around 10 million BEVs and 7 million plug-in hybrids were newly registered worldwide in 2024 – 22% of all new registrations and more than twice as many as three years ago (9%, Figure 1).

Almost all markets around the world show growth. In the US, for example, the numbers doubled from 5 to 10% in the past three years. The greatest increase occurred in China, where the share of electric vehicles has grown rapidly from 5% in 2019 to 16% in 2021 to 41% in the year 2024. In the first five months of this year, the share even averaged 44% and in May almost half of all newly registered cars in China were all-electric (49%).¹

In the EU, the market has recently stagnated. Even so, in 2024 around one in every five newly registered cars, a good 20%, was a BEV or plug-in hybrids, slightly less than in the previous year. In Germany, the share of newly registered electric cars dipped slightly to below the global average for the first time in 2024. This year the trend is pointing upwards again.

Figure 1: Electric vehicle market trend

Share of electric cars (BEVs and plug-in hybrids) in new registrations



Sources: Eurostat, IEA.

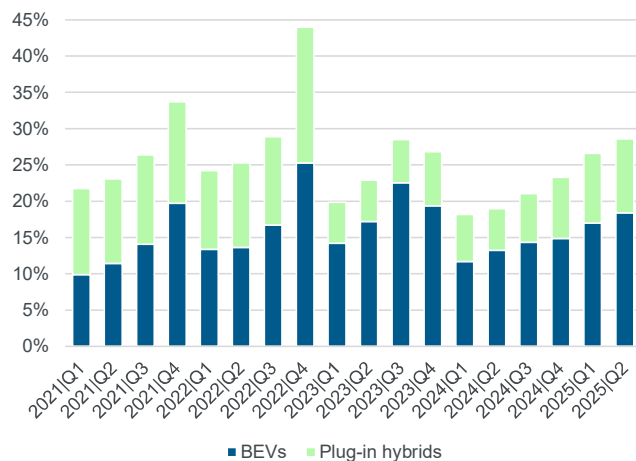
New registrations are picking up again in Germany

Germany is an interesting case not just from a domestic point of view but also because it is the largest market in Europe, including for electric cars. The year 2022 was an exceptional year for electric mobility, with the highest number of new registrations recorded to date (Figure 1). This is mainly due to the expiry of state subsidies on the purchase of plug-in hybrids

at the beginning of 2023. Figure 2 shows a spike in new registrations of plug-in hybrids in the final quarter of 2022 in Germany which was probably driven by pull-forward effects.

Figure 2: Quarterly trend in Germany

Share of BEVs and plug-in hybrids in new registrations



Sources: Kraftfahrt-Bundesamt, own calculations.

Subsidies for BEVs also expired at the end of 2023. This led to another year-end rally, although less pronounced, making Germany the third country in the world after China and the US where more than half a million BEVs were registered in 2023. The expiry of both subsidy schemes caused the share of electric cars to drop below 20% in the first quarter of 2024. Since then, their market share has been growing continuously. The most recent figures show that all-electric vehicles made up 28.6% of new registrations in the second quarter of 2025.

Exports from Germany have grown sharply

The accelerated growth of electric mobility is not just good news for the climate but can also provide benefits for the

German automotive industry, which plays a large role for the country as an industrial location. In assessing its competitiveness, it is important to what extent Germany's automotive industry can maintain its strong export capacity in the transition to electric mobility. Exports by type of engine give an indication of which technologies are important. The following analyses are based on foreign trade statistics on the automobiles manufactured in Germany irrespective of the manufacturers' head offices.

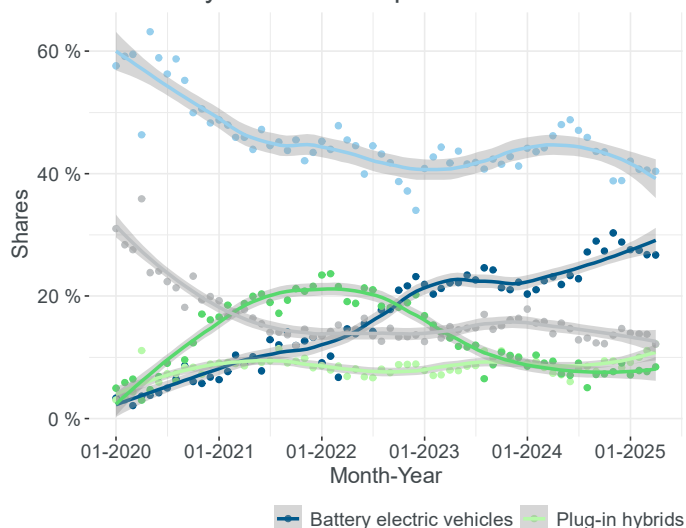
Figure 3 illustrates two different perspectives and shows monthly values since January 2020 as dots. The continuous lines present a local smoothed average and the green areas show the corresponding 95% confidence interval. Whereas the share of exports of cars that run on petrol and diesel has decreased since the year 2020, the proportion of BEVs has grown almost ten-fold from around 3% at the beginning of 2020 to now 27% (Figure 3 A). Absolute values confirm this trend. In the first quarter of 2020, approx. 8,000 BEVs worth EUR 0.4 billion were exported on average each month. In the first quarter of 2025, the monthly average was around 82,000 BEVs worth EUR 3.4 billion. The share of exports of plug-in and self-charging hybrids has been well below that of BEVs since 2023. Most recently, 10% of exported cars were plug-in hybrids and 8% self-charging hybrids.

The smoothed monthly averages show that Germany is a net exporter across all engines. In other words, more cars are being exported than imported. Since the end of 2023, Germany has generated the largest export surplus with BEVs based on value of exports in relation to imports. In the first quarter of 2025, this ratio averaged around 5 for BEVs. That was roughly twice as much as for petrol cars, where the average ratio is a good 2.5 (Figure 3 B), and supports the competitiveness of BEVs manufactured in Germany. But it should be noted that some of the value added is generated

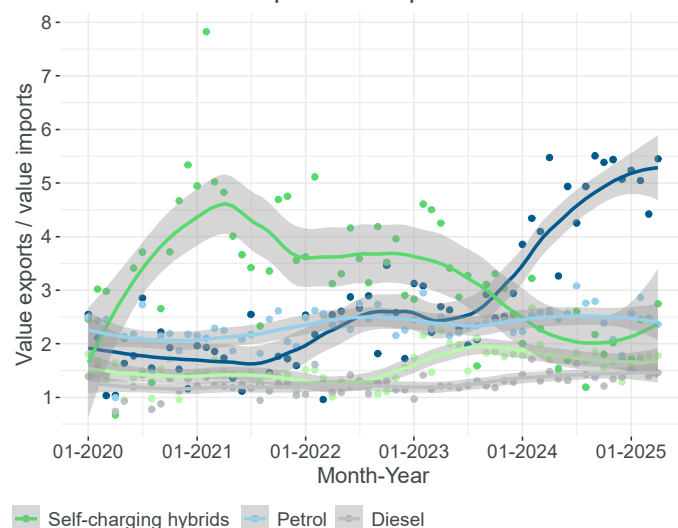
Figure 3: Exports of new cars from Germany by type of engine

Monthly values shown as dots; continuous lines show smoothed averages with the corresponding 95% confidence intervals in grey

A Shares by number of exports



B Ratio of value exports to imports

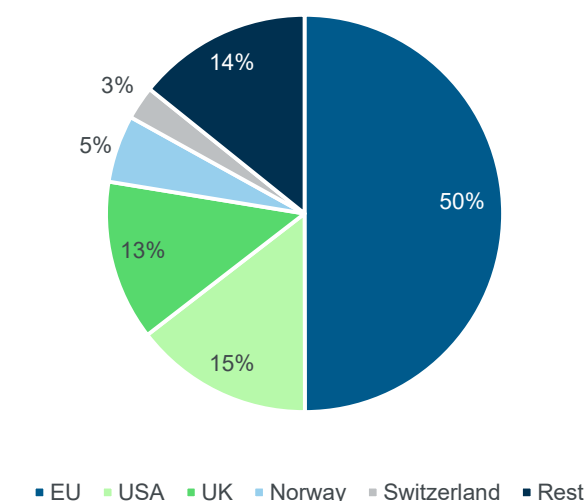


Source: Foreign trade statistics of the German Federal Statistical Office.

abroad.² Since the end of the year 2024, the difference between the value of exports and the value of imports of electric vehicles has also exceeded that of petrol cars.

The target regions of exports play a role in understanding the impact of trade conflicts. Figure 4 shows the shares of export destinations in the total value of exports of all-electric cars from Germany for the year 2024. Half the exports went to the EU, 15% to the US and 13% to the United Kingdom (UK). Overall, the continental European market dominates. Based on export value, more than 70% of exports of BEVs went to the EU, the UK, Norway and Switzerland. China, however, hardly plays a role, accounting for 1% of the share of export value, partly because the vehicle production of German manufacturers for the Chinese market occurs directly in China in cooperation with local manufacturers.

Figure 4: Shares of export destinations in total value of BEV exports for the year 2024



Sources: Foreign trade statistics of the Federal Statistical Office.

Besides trade flows, profitability is another indicator of a location's competitiveness. For the automotive industry, 2024 was generally a bad year. According to a study by the consulting firm EY, profits fell by 20% on average across the industry, with German manufacturers experiencing a 27% drop, which was slightly below the average but still in mid-range.³ The challenges posed by technological transition to electric engines and increased competition from the Far East could be among the possible reasons for this development. Accordingly, increased tariffs on BEV imports from China have been in place since October 2024. The European Union introduced these tariffs because it views state subsidies in China as unfair competitive advantages for Chinese manufacturers.

A mixed view of the future

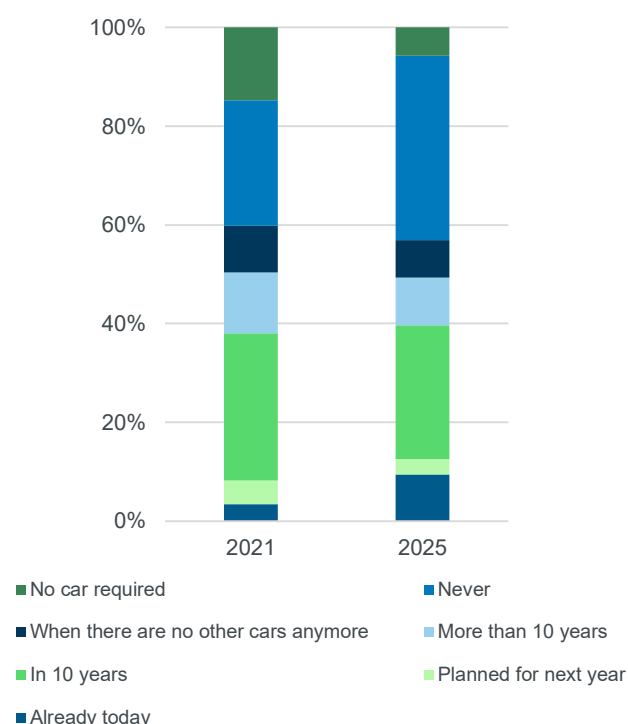
One crucial factor for the future market development is vehicle adoption by consumers. In this respect, the KfW Energy Transition Barometer paints a mixed picture. On the one hand, a good 3% of households plan to purchase an EV next year. That is nearly a third of the share of current users (Figure 5) but it is also the lowest rate in recent years. Combined with households that are thinking about going electric in the future,

around half of households (49%) are thus open to electric mobility.

The other half of households remains sceptical and would drive an electric car only if there were no other cars anymore (8%) or do not see themselves using one (37%). The increase in the number of people who clearly reject a shift to an electric car indicates a polarisation within the population. This may in part be due to the age of the people surveyed, since those who rule out using an EV are on average 64 years old, much older than those who can imagine using one, who are 47 years old on average.

Figure 5: When will you use an electric car on a regular basis?

Shares of households in Germany



Note: The categories 'don't know' and 'no comment' are not shown.

Source: KfW Energy Transition Barometer.

Concerns have decreased over time

The KfW Energy Transition Barometer also allows us to observe concerns about electric mobility over time. The frequency of perceived barriers has decreased, which indicates that electric mobility could continue to gain ground. The purchase price has hardly declined in importance and is today the most common argument against the purchase of an EV, at 59% (Figure 6), even though there is mounting evidence that electric cars are approaching price parity with internal combustion engine (ICE) cars.⁴ The minor drop is probably due to falling prices being offset by the phase-out of government support measures. Besides, there is still no attractive second-hand market.

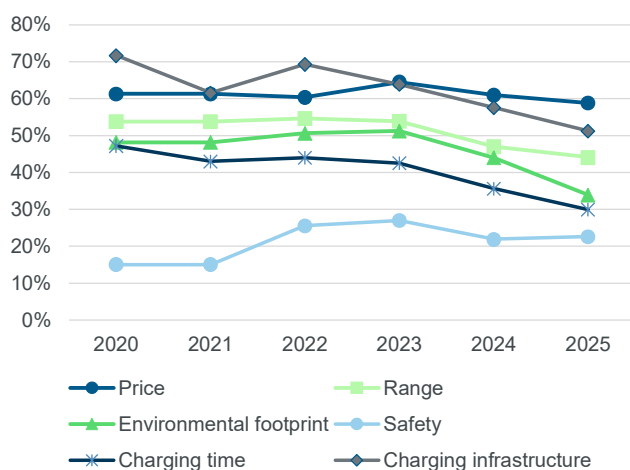
Concerns around usage aspects such as charging infrastructure, charging times and range are also important factors. Over time, these three aspects have been mentioned less often. Doubts about the charging infrastructure were still the dominant factor 5 years ago, preventing 72% of households

from purchasing an EV. Today that figure is a much lower 51%. This is in line with the well-developed public charging infrastructure in Germany and its transparent presentation by the Federal Network Agency.⁵ Concerns around range are now in third place, at 44%. They have dropped from 54% in the survey five years ago. Only 30% of households today perceive charging times as a barrier compared with almost half of households five years ago.

There are also concerns regarding the technology. Safety concerns are the only aspect that has increased in the past five years. This comes as a surprise considering the continuing advances in safety and could be driven by broad media coverage of burning electric vehicles. After all, multiple studies confirm that EVs do not have a higher risk of catching fire.⁶ In addition, the breakdown statistics of the German motoring association ADAC have compared ICE and BEV models of the same age, for example those registered in 2020 to 2022. Accordingly, EVs are actually more reliable than ICE cars.⁷

Figure 6: Reasons for not buying an EV over time

Shares of households without an EV in Germany



Source: KfW Energy Transition Barometer

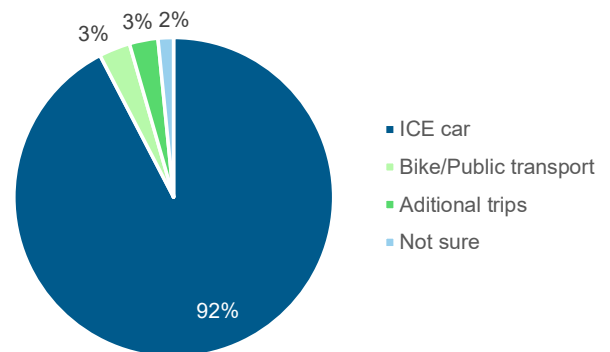
Environmental footprint is improving

Concerns about the environmental sustainability of EVs continue to be a barrier for 34% of households. In 2020 it was almost half of all households. Decreasing concerns about their environmental footprint are in line with the empirical signals that the climate benefits of EVs are increasing steadily. The KfW Energy Transition Barometer reveals that 92% of trips completed with an EV substitute trips with an ICE car and hardly any additional trips are undertaken (Figure 7). Displacing fossil fuel use allows climate benefits to emerge.

In addition, EVs do not produce any tailpipe emissions and produce fewer emissions during operation – even when the carbon emitted to generate electricity for charging is considered. Due to the energy-intensive battery production, however, EVs start off with a ‘carbon debt’ that must first be offset in operation, which means that they have to travel a certain distance before they start delivering climate benefits.⁸ The higher the share of green electricity used for charging, the sooner this is the case.

Figure 7: Trips undertaken with an EV

Average share of substituted trips by households with an EV in Germany

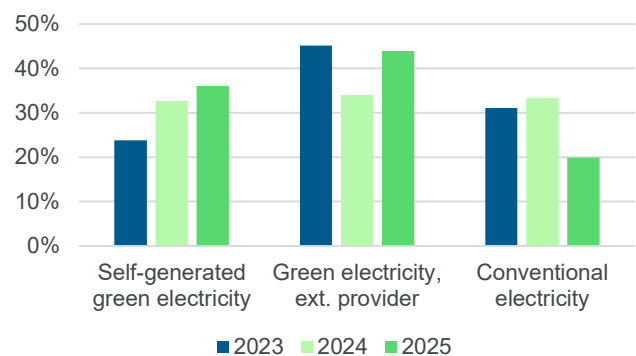


Sources: KfW Energy Transition Barometer 2023.

The growing share of renewables in the German electricity mix gives EVs an increasingly more positive climate footprint over time. Further, more and more households have rooftop solar photovoltaic systems that allow them to charge their cars purely with green electricity. Last year, more than one third of the electricity for charging came from self-generated, green electricity, more than ever before (Figure 8). A further 44% was green electricity from external providers.

Figure 8: Shares of electricity for charging by generation type

Average share of electricity for charging in households with EVs in Germany



Sources: KfW Energy Transition Barometer.

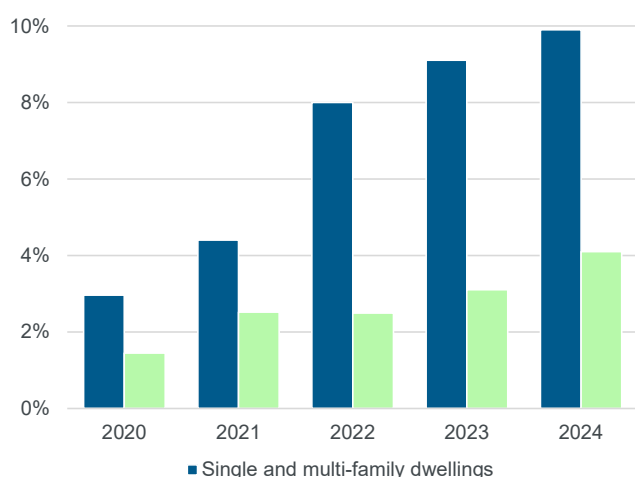
Challenges for inhabitants of multi-family dwellings

Electric cars are cheaper to run than ICE cars.⁹ Charging them with self-generated electricity from a solar system offers further cost benefits.¹⁰ Current studies confirm that the diffusion of household solar systems drives the adoption of EVs both in Germany¹¹ and in the US¹². Most household solar systems are installed on detached or semi-detached houses. Their inhabitants can benefit from the cost advantages of self-generated electricity.

The KfW Energy Transition Barometer confirms the relevance of the type of dwelling for the use of an EV. Four years ago, electric cars were already used twice as often in detached or semi-detached houses as in multi-family dwellings and now even two and a half times more often (Figure 9).

Figure 9: Growth of EV use by type of dwelling

Shares of households with an EV by type of dwelling in Germany



Sources: KfW Energy Transition Barometer.

Initiatives such as Solarpaket I (*Solar Package I*), which is also designed to remove bureaucratic hurdles that prevent multi-family dwellings from generating their own solar electricity, are even more important.¹³ Simplified rules for installing charging points could also facilitate the use of EVs by households in multi-family dwellings. Their inhabitants could also benefit from smart meters in combination with dynamic electricity rates. This would enable them to charge their EVs at a low cost even without a home solar system by charging them at times of low electricity demand. Recent studies show that EV users are sensitive to pricing signals and indeed plan their charging times accordingly.¹⁴ Timing the charging of EVs can also potentially reduce the overall cost of the electricity system because the increasing demand for electricity can be matched with the increasingly weather-dependent supply.

Conclusion

The signs that electric mobility is increasingly gaining traction in Germany are growing. Climate action and the German automotive industry could both benefit from an electrification push.

A variety of approaches can help electric mobility to continue to gain momentum in Germany.

- Reducing information deficits can be helpful, particularly with respect to the safety of EVs and their environmental footprint.
- A further expansion of renewable energy will improve the climate benefits of electric vehicles. In 2024, renewables already accounted for a good 50% of the electricity mix.¹⁵ This must be expanded further.
- Smart charging has the potential to make vehicles more cost-effective and to contribute to integrating renewable electricity into the grid and thus to the success of the energy transition.
- Simplified rules for installing charging points could be relevant for those living in multi-family dwellings.

Removing these barriers could also have a positive effect on the development of the second-hand car market. This market is crucial for many private buyers.

The KfW Energy Transition Barometer

is a representative survey of around 4,000 to 6,000 private households in Germany on decisions and attitudes around climate action. It has been published annually since 2018.

More information on the KfW Energy Transition Barometer can be obtained at: www.kfw.de/energiewendebarmeter.

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¹ Cf. CnEVPost (2025): [China NEV sales hit year-to-date high in May, exports set new record](#), last visited 3 July 2025.

² The battery makes up around one third of the value added of an all-electric vehicle. In 2022, 71% of lithium-ion batteries were manufactured in China (EU: 11%) cf. (McKinsey (2023): [A road map for Europe's automotive industry](#), last visited on 2 July 2025.

³ Cf. EY (2025) [Deutsche Autokonzerne werden bei Umsatz und Gewinn abgehängt](#) (*German automotive groups are being left behind in terms of turnover and profit* – our title translation, in German) press release dated 30 March 2025.

⁴ Cf. Stern (2025) [Analyse: Preisunterschied zwischen E-Autos und Verbrennern auf Tiefstand gesunken](#) (*Analysis: price difference between EVs and ICE cars has dropped to a low* – our title translation, in German), last visited on 2 July 2025.

⁵ Federal Network Agency (2025) [E-Mobilität](#) (*E-mobility* – our title translation, in German), last visited on 10 June 2025.

⁶ Cf. Fraunhofer ISI (2025) [Batterien für Elektroautos: Faktencheck und Handlungsbedarf – Ein Update](#) (*Batteries for electric cars: fact check and need for action – an update* – our title translation, in German) (Policy Brief 01/2025), last visited on 3 July 2025.

⁷ Cf. ADAC (2025) [ADAC-Pannensstatistik 2025: Sind Elektroautos zuverlässiger?](#) (*ADAC Breakdown Statistics 2025: Are electric vehicles more reliable?* – our title translation, in German), last visited on 10 June 2025.

⁸ A study recently published by the International Council on Clean Transportation (ICCT) concludes that in a complete life-cycle analysis, an EV already has a better climate footprint than an ICE from 17,000 km onwards. Many cars reach the 17,000 km milestone within two years of driving. Cf. ICCT (2025) [Life-cycle greenhouse gas emissions from passenger cars in the European Union](#), last visited 9 July 2025.

⁹ Cf. NOW (2023): [Factsheet TCO Vergleich-Antriebsarten-Pkw](#) (*Factsheet TCO Comparison of cars by type of engine* - our title translation, in German), last visited on 10 June 2025.

¹⁰ In the first half of 2023, the financial benefit of charging an EV with self-generated solar electricity over external sources was more than EUR 400 per year, see Rode, J. (2024): [Solar Photovoltaics and Battery Electric Vehicles](#), Working Paper, available at SSRN.

¹¹ Rode, J. (2024): Solar Photovoltaics and Battery Electric Vehicles, Working Paper, available at SSRN.

¹² Lyu, X. (2023): Are Electric Cars and Solar Panels Complements? *Journal of the Association of Environmental and Resource Economists* 10.4, p. 1019–1057; freely available as SSRN Working Paper.

¹³ Cf. Federal Government (2024) Mehr Photovoltaik mit Solarpaket I (*More photovoltaics with Solar Package* – our title translation, in German), last visited on 3 July 2025, and BMW (2025) FAQs zum Solarpaket I (*FAQs on the Solar Package I* – our title translation, in German) last visited 3 July 2025.

¹⁴ According to, Bailey, M. R. et al. (2025, Show me the Money! A Field Experiment on Electric Vehicle Charge Timing, *American Economic Journal: Economic Policy* 17(2):259–84; freely available as NBER Working Paper), a 23% discount on the electricity price cuts EV charging at times of high demand in half in Calgary, Canada. Bernard, L. et al. (2025, The Impact of Dynamic Prices on Electric Vehicle Public Charging Demand: Evidence from a Nationwide Natural Field Experiment, Working Paper) confirm that EV users respond to price signals at public charging points in the United Kingdom.

¹⁵ Cf. German Federal Environment Agency (UBA) (2025) Indikator: Anteil Erneuerbare am Bruttostromverbrauch (*Indicator: Share of renewables in gross energy consumption* – our title translation, in German), last visited on 3 July 2025.