



Used electric cars are hot, leasing deals are not

An analysis of used car prices in Europe

February 2023

Summary

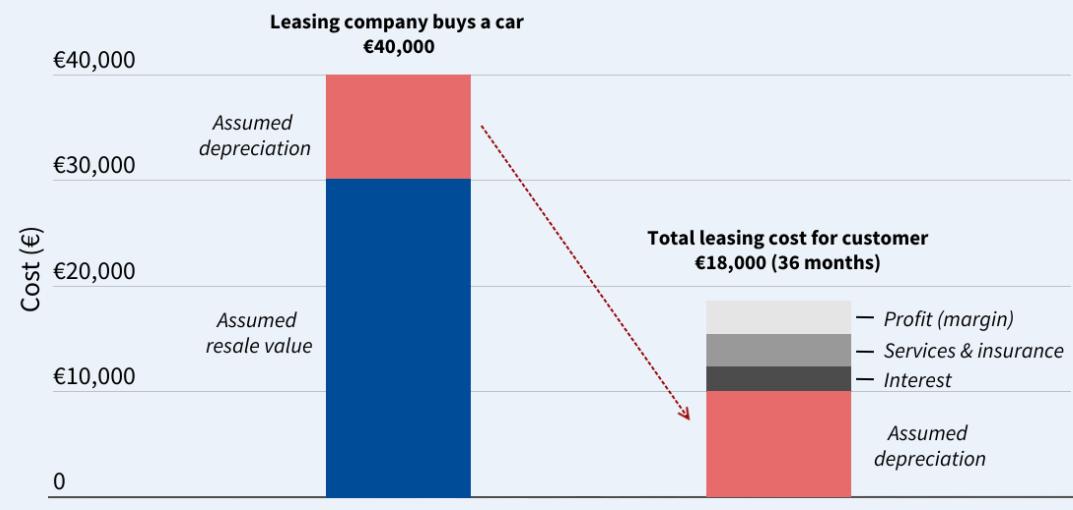
Leasing companies control a growing share of the car market, accounting for 22% of new cars sold in Europe in 2022. Within the sector, the top ten leasing companies are big players with a fleet of 12 million cars between them. As the supply of cars has tightened, these leasing companies reached record profits in 2021 that are expected to double again in their 2022 accounts.

Leasing companies claim to be leading the transition to electrification but the data tells a different story. None of the top ten leasing companies will disclose their current uptake of battery electric vehicles (BEV), nor will they set an ambitious BEV target. **T&E analysis of used car prices suggests that leasing companies are actually slowing down the shift to electromobility due to their conservative pricing that overcharge drivers that want to lease an electric car.**

The business model of leasing companies is to own a car for a fixed period and charge the driver for the expected loss of value – the depreciation – of the car over this period through a monthly lease. For a standard 36 month contract, a leasing company will compose a monthly lease cost that covers the expected depreciation of the car, services (e.g. repairs, maintenance, tires, insurance), interest, and a profit margin.



Price setting by leasing companies



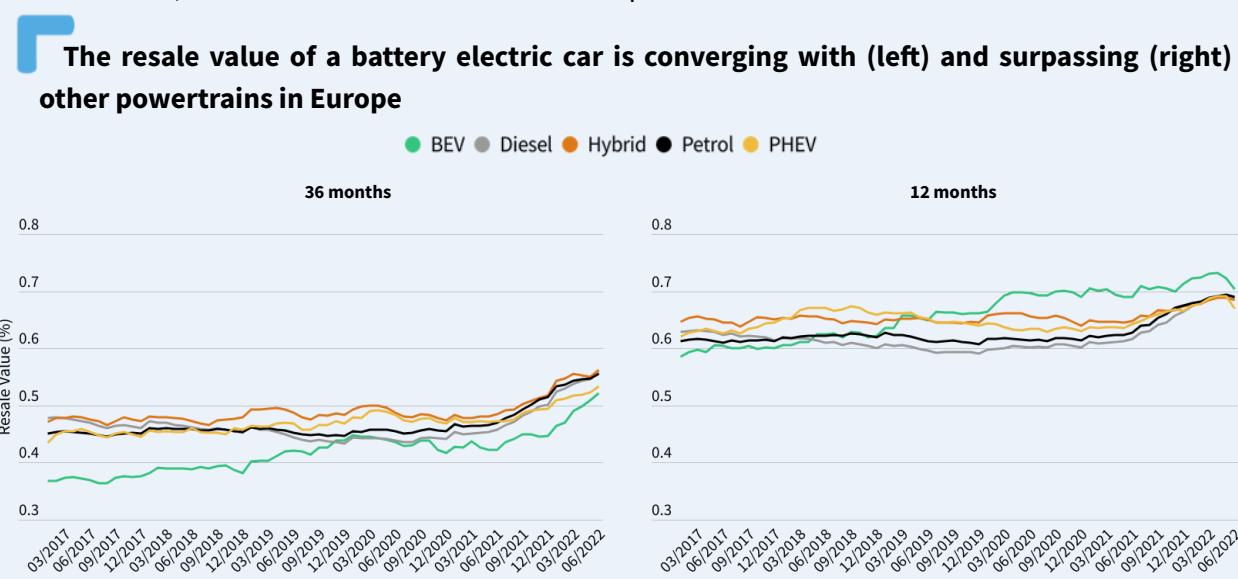
A briefing by

T&E analysis reveals that across major European markets, leasing companies charge consumers 57% more to lease a BEV compared to an equivalent petrol model. This equates to an additional €233 per month and €8,370 over a 36 month contract. As other leasing costs such as repair, maintenance, and taxation are equal or lower for BEVs, this points to an assumption by leasing companies that BEVs carry a higher depreciation cost.

While the sticker price of battery electric cars is higher than an equivalent petrol, it is the value loss of the car (i.e. the depreciation), not the purchase price itself, that determines the monthly leasing price that consumers pay. The higher leasing deals for BEVs therefore means that leasing companies assume that BEVs will depreciate more than a petrol or diesel car.

T&E tested this assumption by analysing 2.7 million used car prices in Europe's biggest markets. The results show that the assumptions made by the leasing companies are not in line with actual market data. The average resale value of BEVs across Europe's five largest markets (see Figure below) is much higher than assumed by leasing companies:

- Looking at cars that are owned for 36 months, BEV resale values for the major European markets Germany and the UK are at the same level of a petrol or diesel car. For France and Spain, there is still a (small) difference, but the point of convergence is approaching.
- Looking at BEVs that are sold after 12 months, T&E data reveals that they have even better resale values than other powertrains. This shows that with new BEV models entering the market, their resale value will continue to improve further.

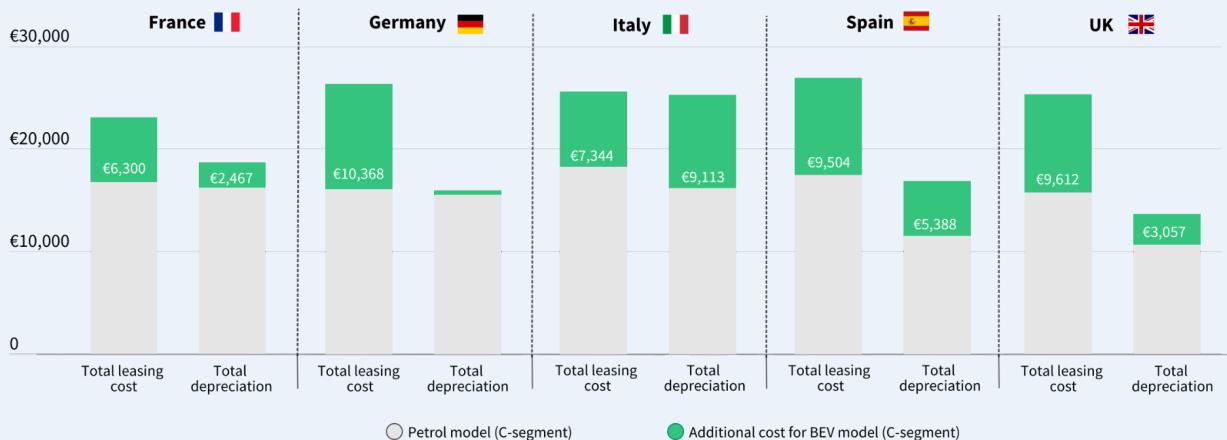


The resale value data shows that there is a clear misalignment between the high monthly rates for BEVs set by the leasing firms and their actual depreciation in the used car market (see Figure below).

This raises the question if leasing companies are overpricing battery electric cars and as a consequence are holding back the transition to electric cars in Europe.



Higher leasing rates for battery electric cars (BEV) do not match their loss in value



Source: T&E analysis based on Autovista Residual Value Intelligence tool.

Notes: Leasing deals of 36 months and 60,000km (based on offers for a VW ID.3 and a VW Golf). The depreciation rates are calculated on C-segment vehicles. Calculations include national purchase grants for corporate registrations.

Due to their size, but also the shorter ownership period of their cars (three or four years compared to ten to twelve years for private households), the leasing sector has an enormous impact on the used car market. This means that electrifying the leasing sector would bring large numbers of affordable used electric cars onto the market, making BEVs accessible to many households in Europe.

T&E research shows that a fast transition to fully electric cars is viable. Instead of CSR activities such as planting a tree for each car sold, leasing companies can make a real difference in the transition to electro-mobility by reforming their actual business model and corporate policies. Leasing companies should do the following:

- **Set timely and ambitious targets** for their transition to an electric future meaning committing to 100% BEV registrations in 2027 and a 100% BEV fleet in 2030.
- **Review their residual value setting process and pricing strategies** in light of today's discrepancy between high BEV leasing deals and low BEV depreciation in used car sales.
- **Publicly support and advocate for company car tax reforms** at a national level (to incentivise uptake of fully electric cars) and an **EU fleet mandate** of 100% BEVs by 2030.
- **Disclose their annual uptake** of BEVs to create more transparency for investors and other stakeholders.
- **Provide more transparency for consumers** by clearly communicating on their website the actual leasing prices including taxes and subsidies, the estimated total cost of ownership, and the real-world emissions of the cars they are leasing.

1. Leasing companies: the 12 million car fleet you've never heard of

As of 2035, no more diesel, petrol or hybrid cars can be sold in Europe anymore. The transition to a zero-emission car fleet demands all parts of the automotive industry to reevaluate whether their business practices are fit-for-purpose. Car manufacturers are launching new models, converting their factories, and retraining their workforce. European industry is shifting from parts for combustion engines towards parts for EVs: electric motors, power systems, batteries and the related upstream supply chain.

The role of leasing companies in this transition has largely gone unscrutinised. This should change. Leasing companies continue to grow in size and are now the predominant means of car acquisition. Leasing companies are also slowing the transition to a zero-emission fleet through their conservative pricing approach that sets high monthly leasing deals for battery electric vehicles (BEVs). Given their weak climate targets for 2025 and 2030, this position as market laggard is unlikely to change. For Europe to transition to a zero-emission fleet, leasing companies will need to take a leading role that reflects their powerful position in the car market.

1.1. Leasing companies are extremely large

Purchasing a car outright is no longer the norm in Europe. Today, most new cars are acquired through a leasing company that either owns the car and leases it at a monthly rate (i.e. service leasing) or sells the car on loan through a monthly payment plan (i.e. financial leasing). Leasing companies continue to grow in size and in 2022 accounted for 22% of new car registrations in Europe.¹

Cars owned by leasing companies are typically held for a short period of time (e.g. three to four years) before being sold onto the used car market, meaning their share of the total *car parc* is small. However, as leasing companies source such a large share of *new registrations*, they determine the type of cars entering the market. These decisions have implications for CO₂ emissions well beyond a car's life as a leased asset.

The top ten leasing companies dominate the market

The ten largest leasing companies represent 11.5 million cars owned between them (Table 1). Only one of the top ten leasing companies, LeasePlan, is exclusively a car leasing company. Three leasing companies are owned by banks and six leasing companies owned by car manufacturers. The six leasing companies owned by car manufacturers – the ‘captive leasing companies’ – are typically used by the carmaker as a channel to promote and distribute their cars.

¹ Includes EU27, minus Bulgaria due to lack of data, and including the UK. T&E calculations based on Dataforce (2023). New passenger car registrations 2022.

Table 1: Details on the ten largest leasing companies (2021)

Leasing company and owner	Number of leased cars (million)	BEV share of new leases	BEV share of leased fleet	EV share of new leases	EV share of leased fleet	Earnings (€ million)	Profits (€ million)	EV target for new leases
VW Financial Services	3.96**	Not disclosed	Not disclosed	Not disclosed	Not disclosed	22,362**	1,848**	70% EV in 2030
ALD (Société Générale Group)	1.63	Not disclosed	Not disclosed	27%	Not disclosed	1,716*	822*	25% BEV in 2025 50% BEV in 2030
LeasePlan	1.47	Not disclosed	Not disclosed	25%	6%	9,433	741	100% EV in 2030
Arval (BNP Paribas)	1.44*	Not disclosed	Not disclosed	29%	14%	1,698*	705*	35% EV in 2025
Leasys and Free2Move Lease (Stellantis)	0.75	Not disclosed	Not disclosed	Not disclosed	Not disclosed	No data	No data	Not disclosed
Alphabet (BMW)	0.70	Not disclosed	Not disclosed	30%	Not disclosed	23,566* all services	2,090* all services	Not disclosed
Mercedes-Benz Financial Services	0.52***	Not disclosed	Not disclosed	Not disclosed	Not disclosed	10,966* all services	1,012* all services	Not disclosed
Athlon (Mercedes-Benz)	0.40	Not disclosed	Not disclosed	Not disclosed	Not disclosed			50% EV in 2025
Mobilize Financial Services (Renault)	0.35	Not disclosed	Not disclosed	9%	Not disclosed	15,793	753*	Not disclosed
Lex Autolease (Lloyds)	0.28	Not disclosed	13%	Not disclosed	25%	2,504	472	100% EV in 2030

Source: T&E compilation based on leasing company annual reports, financial statements, and corporate social responsibility reports. Two requests for public information were sent to all ten leasing companies in January 2023.

Notes: "EV" includes BEV and PHEV. "All services" includes non-leasing business activity.

* Fleet number by region not disclosed. Global fleet number adjusted to the European continent based on the European share of global fleet value.

** Fleet number and value by region not disclosed. Global fleet number adjusted to the European continent based on the European share of global employees.

*** Fleet number not disclosed. Total leased and financed cars in Europe adjusted to leased cars based on a 42.4% leasing share (average of leasing:finance share for reporting companies).

Leasing companies supply low and middle income consumers through the used car market

The size of leasing companies has important implications for the flow of cars into the used car market. At the end of a typical three to four year leasing period, leased cars undergo remarketing where they are sold on the used car market either directly, through auction houses, or other third parties. For low and middle income households – for which new cars can be an expensive proposition – the used car market is the predominant means of buying a car. For the highest income decile in the EU, 31% of cars were purchased new and 69% used. For the lowest income decile, only 3% of cars were purchased new and

97% used.² Assuming a 3-4 year ownership period, every year, an estimated 3.29 million cars are sold annually from leasing companies (directly or indirectly)³ onto the used car market (representing an estimated 7% of sales).⁴

1.2. Leasing companies are extremely profitable

2021 was a record year for leasing companies with €2.6 billion in profits for the top three leasing companies (Table 1, note that many of the captive leasing companies do not report separate financial accounts). This record is unlikely to last, however, as year-on-year profits for the first half of 2022 nearly doubled for ALD (+71%),⁵ Arval (+87%),⁶ and Leaseplan (+93%).⁷ Profits are now over €3,000 per car sold.⁸

1.3. Leasing companies are not leading the transition to zero-emission cars

The major leasing companies promote their image as environmental actors in their corporate social responsibility (CSR) statements, claiming to be “the first mover in powertrain transition”⁹ and “leading the transition to zero-emission mobility”.¹⁰ However these statements are not supported with data, as none of the top ten leasing companies disclose their share of zero-emission cars new registrations, even when requested.¹¹ What some major leasing companies (five out of ten) provide is “EV uptake” which includes plug-in hybrid electric cars known to have real-world emissions similar to combustion engines in their average real world use cases (Info Box 1). To derive an estimate of fully electric cars in their new fleet, data from the French market can be used where a national regulation requires fleet reporting. The

² Vanherle, K. and Vergeer, R. (2016). Data gathering and analysis to improve the understanding of 2nd hand car and LDV markets and implications for the cost effectiveness and social equity of LDV CO2 regulations. DG Climate Action. <https://www.tmlieven.be/en/project/pricingandtrade-secondhandcars>

³ T&E calculation based on a fleet of 11.5 million cars (Table 1) and a 3.5 year turnover.

⁴ Based on a European turnover of 40 million cars annually in the used car market, extrapolating from 11 countries in Research and Markets (2022). European used car growth opportunities. Frost & Sullivan. <https://www.researchandmarkets.com/reports/5633579/european-used-car-growth-opportunities>

⁵ ALD (2022). First Half 2022 Financial Report. ALD.

<https://www.aldautomotive.com/Portals/international/Documents/220804%20-%20ALD%20H1%202022%20Financial%20Report.pdf>

⁶ Arval (2022). Statutory Auditors’ Review Report on the Half-yearly Financial Information. Arval Service Lease. https://www.arval.com/sites/default/files/inline-files/Arval_2022_half-year_results_and_statutory_auditor_s_review_report_on_the_consolidated_financial_statements_as_of_June_30th_2022.pdf

⁷ LeasePlan (2022). LeasePlan announces Q2 2022 results. LeasePlan.

<https://www.leaseplan.com/corporate/~/media/Files/L/Leaseplan/documents/2-2022.pdf>

⁸ FleetEurope (2022). ALD reports record €1.2-billion half-yearly income. FleetEurope.

<https://www.fleeteurope.com/en/financial-models/europe/features/ald-reports-record-eu12-billion-half-yearly-income>

⁹ ALD (2022). Move 2025 - Our Strategy. ALD.

<https://www.aldautomotive.com/about-ald-automotive/move-2025-our-strategy>

¹⁰ LeasePlan (2022). Ready for electric? How to prepare for an EV fleet transition. LeasePlan.

<https://www.leaseplan.com/en-ix/blog/fleet-management/ev-fleet-transition/>

¹¹ Two requests for public information were sent to all ten leasing companies in January 2023.

two-thirds PHEVs and one-third BEVs ratio from this data means that none of the major leasing companies are above the EU market average in terms of BEV uptake.¹²

INFO BOX 1: Plug-in hybrids are not zero-emission cars

PHEVs are typically advertised with test-cycle emissions in the range of 30-60g CO₂/km, but analysis of charging behaviour and real-world world emissions has revealed emissions three to five times as high.¹³ The result is that real-world CO₂ emissions from PHEVs, particularly PHEV corporate cars, are more comparable to an ICE car.

There are several factors leading to high PHEV emissions:

- There is a fundamental design problem of PHEVs where the small e-motor is ineffective when accelerating at pace and the ICE is often activated in real world use. Many models also lack fast charging capabilities, requiring long charging times even for the smaller PHEV battery and leading PHEV users to often drive with an empty battery.
- Testing has shown that PHEVs are being driven with greater acceleration and on longer trips before charging than under test-cycle conditions. This driving behaviour is particularly problematic for the corporate fleet as the cars are driven further and charged less.
- PHEVs tend to be larger and heavier than the average ICE car.
- All cars powered by an ICE — PHEVs included — continue to demonstrate a gap between test-cycle and real-world performance despite improvements in testing procedures.

While best practices such as daily charging can mitigate these factors, modeling has revealed that even with daily charging real-world emissions from the corporate fleet would still be twice as high compared to the WLTP values due to the high mileage and average trip length of those cars.¹⁴ The conclusion is that PHEVs cannot be considered a zero-emission car.

Data for the entire market (i.e. new registrations by any leasing company, other corporate entity, or private household) also reveals that in some of the major European markets, the leasing sector is holding back the transition to zero-emission cars as its uptake lags behind the rest of the market. In France, Spain, and Italy, BEV uptake in the leasing sector is lower than other true fleets¹⁵ and in France and Spain it is

¹² Comparing 10% BEV uptake in Europe in 2021 with calculated BEV uptake of ALD 9%, Leaseplan 8%, Arval 10%, RCI 3%, Alphabet 10%.

¹³ ICCT (2022). Real-world usage of plug-in hybrid vehicles in Europe: A 2022 update on fuel consumption, electric driving, and CO₂ emissions. ICCT. <https://theicct.org/publication/real-world-phev-use-jun22/>

¹⁴ Institut für angewandte Ökologie, Transport & Environment, Institut für Energie- und Umweltforschung Heidelberg. (2020). Plug-in hybrid electric cars: *Market development, technical analysis and CO₂ emission scenarios for Germany*. <https://www.oeko.de/uploads/oeko/oenodoc/PHEV-Report-Market-Technology-CO2.pdf>

¹⁵ True fleet includes all registrations to companies excluding short-term rentals, leasing and, demo cars, and, in this analysis, leasing and long-term rental.

even lower than private households.¹⁶ In Germany (where the registrations for the leasing sector and the rest of true fleets are combined), BEV uptake in corporate fleets are also lagging behind private households.¹⁷ The UK stands out as an exception where the leasing sector is leading on the zero-emission transition with a BEV uptake of 34.2%.¹⁸

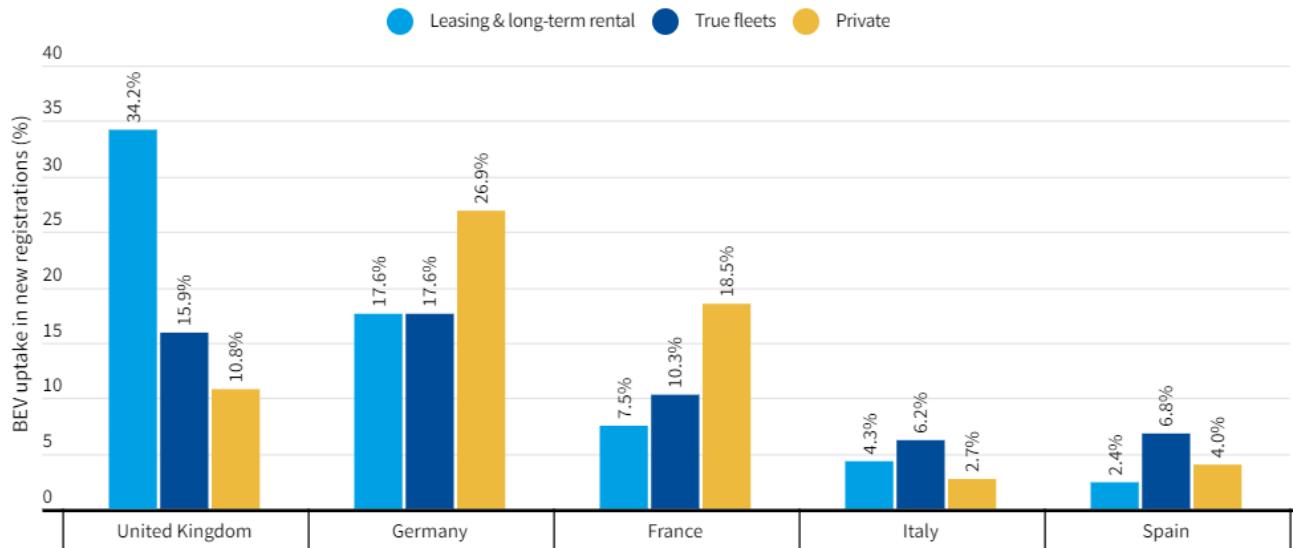


Figure 1: BEV uptake in leasing, true fleet, and private households in European countries

Source: T&E calculations based on Dataforce (2023). New passenger car registrations 2022. Registrations for the leasing sector and the rest of true fleets are combined in the German data.¹⁹

These surprising results with leasing companies lagging the private registrations in some major markets has not been widely reported.

Leasing companies have weak ambitions for the zero-emission transition

Not only do the major leasing companies decline to disclose their share of zero-emission cars, they also have very weak or even no electrification targets (Figure 2a). Only one of the top ten companies has set a zero-emission target (ALD: 50% BEV in 2030). This target is underwhelming and well below the current developments and future projections of the automotive market. The EU has regulation for 100% zero-emission cars in 2035 and several carmakers have a 100% zero-emission target for 2030 and will thus end their production of polluting cars (Figure 2a). No leasing company has a 100% zero-emission target for 2030.

¹⁶ T&E calculations based on Dataforce (2023). New passenger car registrations 2022.

¹⁷ Ibid.

¹⁸ Ibid.

¹⁹ Addendum: This figure was amended on 6 March 2023 to update the private BEV uptake in new registrations in Germany from the 2021 figure (21.6%) to the 2022 figure (26.9%).

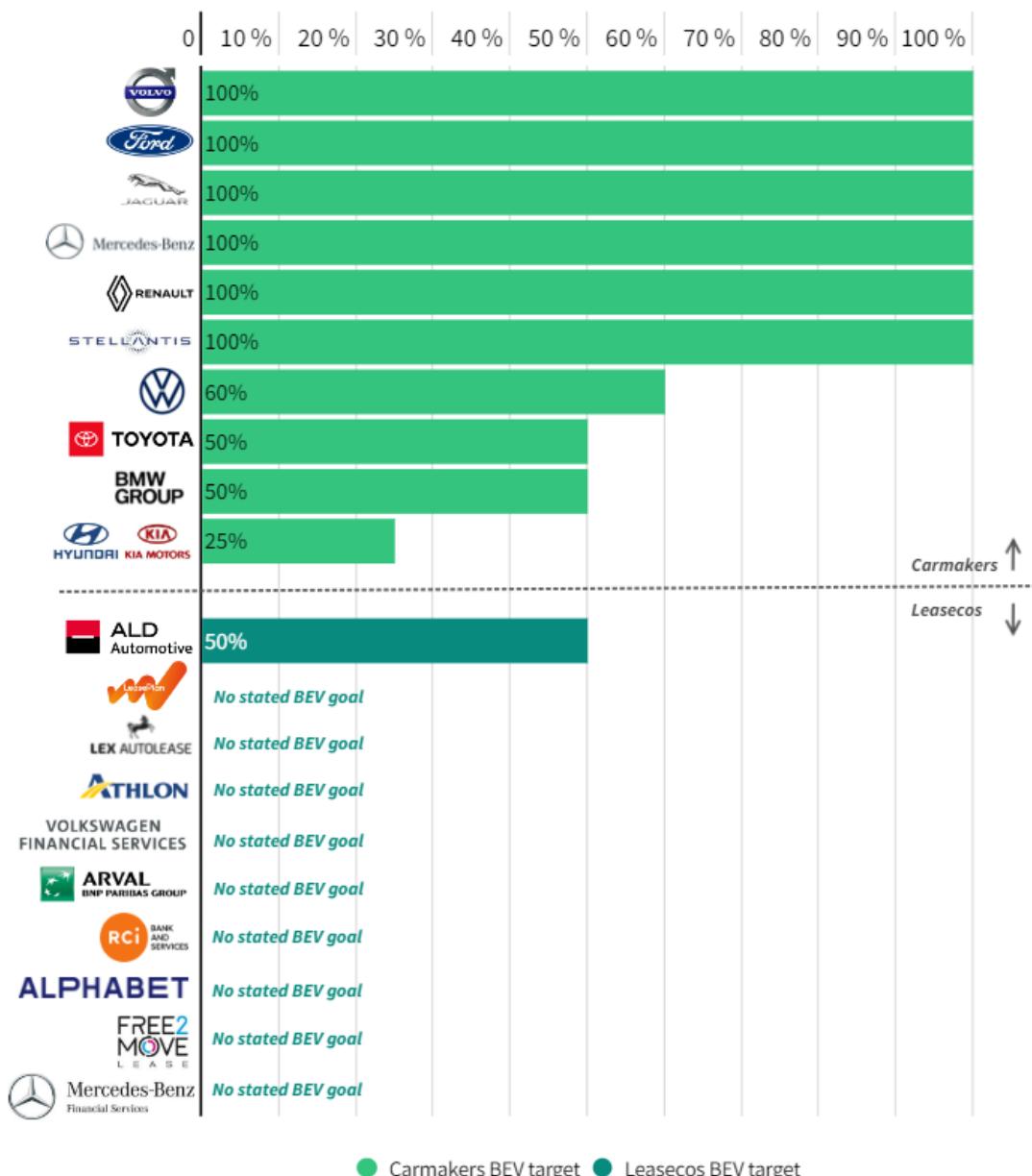


Figure 2a: Comparison of OEM and leasing company BEV targets for 2030

Source: T&E compilation of company statements.

Notes: Renault target applies to the brand, not the Renault group as a whole. The Hyundai-Kia target is a global target. The Toyota target is for Western Europe.

Looking at the others, five major leasing companies (Leaseplan, Lex Autolease, Volkswagen Financial Services, Athlon and Arval) are performing even worse and have only set an ‘EV target’ (Figure 2b) which allows them to continue leasing PHEVs – unlike the zero-emission targets by OEMs. Even with the inclusion of PHEVs, which are shown to be high emitting cars (Info Box 1), most leasing companies fall short of 100% sales in 2030. The remaining leasing companies (RCI Bank, Alphabet, Free 2 Move Lease and Mercedes-Benz Financial Services) have not even set an electrification target at all.

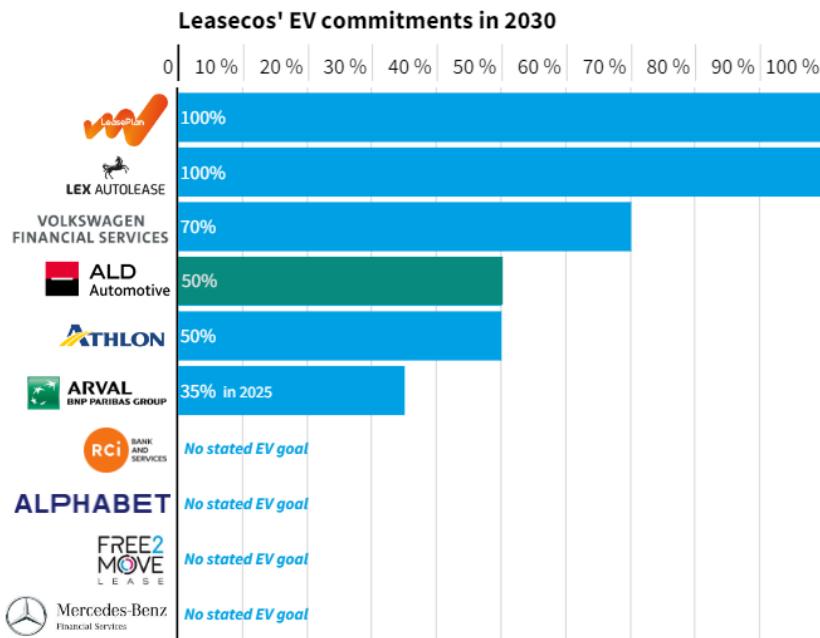


Figure 1b: Comparison of leasing company EV (BEV and PHEV) targets for 2030

Source: T&E compilation of company statements

Note: ALD commitments are for BEVs

2. Leasing companies, concerned about BEV resale value, offer expensive leasing deals

Through their pricing, leasing companies have a steering effect on car selection as potential lessees consider the value and price of different leasing deals. Following the ‘law of demand’, when lease prices are low, uptake is high and when lease prices are high, uptake is low.

2.1. Leasing deals are based on the expected depreciation of cars

The business model of a leasing company is to own a car over a fixed period (typically the first years of a car’s ownership) and charge the lessee for the expected depreciation of the car (i.e. the loss of value) over this period. For a standard 36 month contract, a leasing company will compose a monthly lease rate that covers the expected depreciation of the car (per month), any services included (e.g. repairs, maintenance, tires, insurance), and a profit margin.

As an illustrative example, if a leasing company purchases a car for €40,000 and expects that it can be sold as a used car for €30,000 after 36 months (i.e. a residual value of 75%, see Info Box 2), then the €10,000 difference between new and used car value represents the depreciation of the car. This difference, plus €8,000 in services, insurance, interest, and profit, results in a total leasing cost of €18,000 over a 36 month contract or €500 per month (Figure 3).

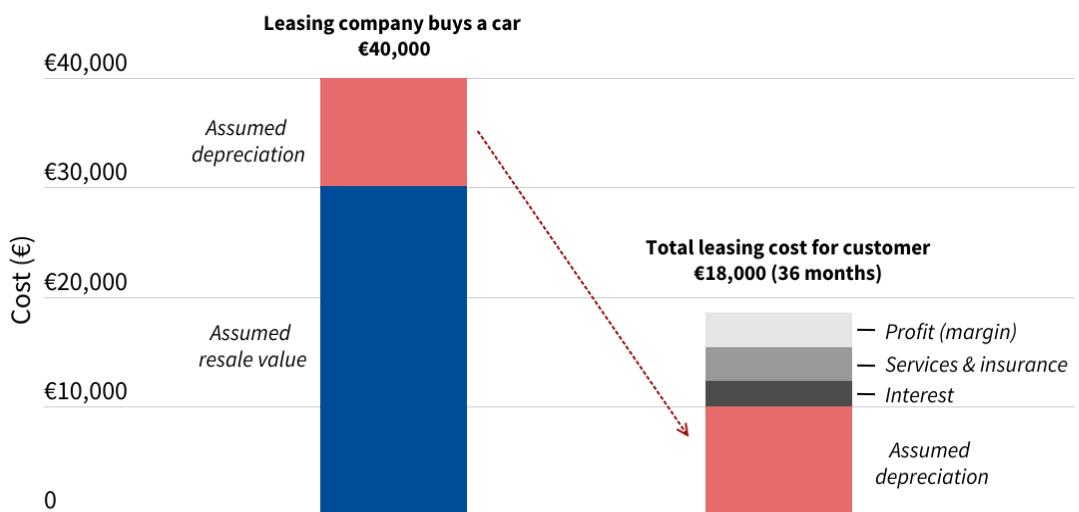


Figure 3: Price setting by leasing companies

Source: T&E illustration based on 36 month leasing deal

The estimation of a car’s value at the end of the leasing contract – the residual value – thus forms an essential role in how monthly lease prices are derived and if profits are made. If the residual value is an overestimation of the actual resale value, the monthly lease price will be ‘too low’ and the leasing company will face reduced profitability and may even lose money on the contract (to the benefit of the lessee). If the residual value is an underestimation of the actual resale value, the monthly lease price will be ‘too high’ and while the leasing company will make higher profits per car, overall sales may suffer. Over

the past few years, strong demand in the used car market has resulted in high resale values and profits for leasing companies have reached record highs.

INFO BOX 2: Resale value terminology

Depreciation - The decline in the value of an asset over time. In the context of car leasing, this refers to the difference between car value at the beginning and end of the leasing contract.

Residual value - The expected value of an asset at the end of a specified period. In the context of car leasing, this refers to car value at the end of the leasing contract.

Resale value - The market value of an asset when sold. In the context of car leasing, this refers to the actual price paid for the car on the used car market.

The terms residual value and resale value are often used interchangeably. For this briefing, a distinction is made in the terminology for the *expected* value of a car at the end of a leasing agreement (residual value) and the *actual* value of the car when it is sold on the used car market at the end of the leasing agreement (resale value).

2.2. Leasing companies offer BEVs with high monthly lease prices

Leasing deals for BEVs are priced much higher than their ICE equivalents. Across major European markets, leasing companies charge consumers €233 more (57%) to lease an electric car compared to an equivalent petrol model. This premium is even higher in Germany (69%) and Spain (61%) (Figure 4). While the sticker price of battery electric cars is higher than an equivalent petrol, it is the value loss of the car (i.e. the depreciation), not the purchase price itself, that determines the monthly leasing price that consumers pay.²⁰ Something in the business model of leasing companies is causing – or is expected to cause – higher BEV costs for leasing companies.

²⁰ The percentage difference in price between BEV and petrol leasing deals is also higher than the difference between BEV and petrol purchase prices in France (3/4 comparisons), Germany (4/4 comparisons), Spain (4/4 comparisons), and the UK (4/4 comparisons) but not in Italy (1/4 comparisons).

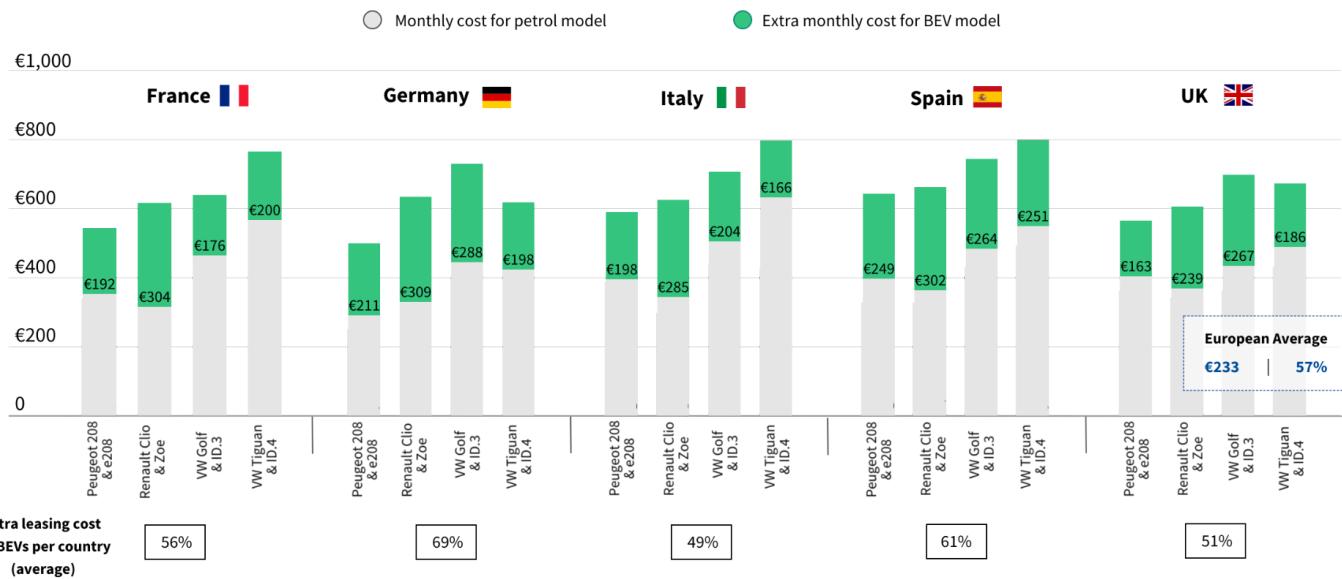


Figure 4: Price difference between BEV and petrol leasing deals, per country

Source: Average of leasing deals from T&E mystery shopper exercise.²¹

Notes: Based on corporate leasing deals of 36 months and 60,000km.

The precise calculation of leasing deals is a guarded practice held by each individual leasing company, but the general practices are well known (Info Box 3). Key to this formulation is how the value of a car is expected to depreciate over time, as are any differences in the cost of services, the cost of insurance, and/or profit margins on the lease (Figure 2).

INFO BOX 3: The process of determining residual values

The exact determination of residual values is a guarded part of leasing company businesses and a method of competitive advantage, but the general four-step process is understood and common to all leasing companies:

- Benchmarking:** To create a baseline, regression models are constructed which may have up to 200 variables including brand, model, age, mileage, engine, exterior colour, interior colour, base equipment, special equipment, and accessories.

²¹ Leasing deals were requested through phone calls and emails to national branches of large leasing companies during January 2023. If leasing deals were not received, online offers were used where publicly available. The averages are calculated from multiple leasing companies in France (ALD, Arval, LeasePlan, RCI Bank and Services, VWFS), Germany (ALD, Free2Move, VWFS), Italy (ALD, Arval, LeasePlan), Spain (ALD, Arval, Free2Move, Leaseplan, RCI Bank and Services, VWFS), and the UK (LeasePlan, Lex Autolease, VWFS, Zenith). The four model pairings are a Peugeot 208 PureTech 75 S&S Active Pack and a Peugeot e208 Electric 136CH Active Pack, a Renault Clio Equilibre TCE 90 and a Renault ZOE Equilibre E-tech Equilibre R110, a VW Golf Life 1.0 TSI 81 kW (110 CV) 6 vel and a VW ID.3 Entry 150 kW (240 CV) 58 kWh, a VW Tiguan Life 1.5 TSI 110 kW (150 CV) DSG 7 vel. and a VW ID.4 Pro 128 kW (174 CV) 77 kWh. Where a specified model variant was not available the closest alternative was used.

- 2. New product drivers:** New products may depart from the benchmarking exercise based on historical data. In such cases, an additional estimation is included to adjust the expected demand up or down depending on the technology and its desirability. This may involve a new model, which is evaluated using a scoring model that adds or subtracts points (e.g. aesthetics, performance, volume, function, image) or an entirely new technology such as battery electric technology. In some cases this adjustment may be left to the residual value committee.
- 3. Adjust based on external impacts:** The baseline, which is car-specific, and the new product drivers, which are technology-specific, are adjusted based on factors outside the domain of car markets including macroeconomic factors (wages, unemployment, interest rates), consumer perceptions of technology, environmental-mindedness of consumers, and interest in car offerings (e.g. connected services, entertainment).
- 4. Residual value committee:** The RV committee within a leasing company makes the final step and ratifies a proposal for the residual value. These decisions may be model-specific or involve changes to the broader methodology, for example the weighting of different factors. The committee membership may include individuals from top management, finance, remarketing, sales, and control departments – each with their own views and motivations given their role in the company.

The difference in service costs does not explain the difference. For BEVs, repairs and maintenance costs should be equal or lower as there are no recurring oil changes and fewer mechanical wear parts.²² The insurance costs, while higher for BEVs, are proportional to car price (and less than the difference in lease price). Taxes covered in leasing contracts, such as annual ownership taxes, are also lower for BEVs as these taxes are often linked to car emissions.²³

The higher leasing deals for BEVs therefore suggest that leasing companies are quite pessimistic about BEV resale values and are thus applying low residual values in their leasing deals. However if BEV resale values are strong, then leasing companies are profiteering off BEVs while holding back the transition due to their high price setting. The following sections will first outline the reasons why BEV resale values may be strong or weak (Section 2.3) and then examine the evidence analysing resale values of used cars (Section 3).

2.3 Why BEV resale values might be high or low

The potential resale values for BEVs on the used car market are constantly being reevaluated as consumer perceptions, regulations, and the technology itself continue to evolve. These complex dynamics can be

²² This is confirmed in TCO studies from leasing companies, for example the Car Cost Index from LeasePlan.

²³ Transport & Environment. The good tax guide: A comparison of car taxation in Europe.

<https://www.transportenvironment.org/discover/the-good-tax-guide/>

even more difficult to assess on the used car market as the volumes of BEVs are small and used BEVs are still an unfamiliar product.

2.3.1. Why BEV resale values might be low

There are multiple reasons to expect low BEV resale values, from concerns about battery degradation, inferior used BEVs in comparison to newer models, an oversaturation of the market, and more general unknowns.

Consumer perception of used BEVs: Battery degradation

Concerns about battery degradation are often expressed not just as a source of uncertainty, but as a *loss* in valuation compared to other cars. Potential battery degradation resulting from previous ownership of the car would mean that a BEV depreciates faster and has a worse resale value than an ICE car.

Consumer perception of new BEVs: Product improvement with newer models and lower prices

Whereas concern surrounding battery degradation points to the technological *limitations* of BEVs, there is a second source of downward pressure on resale values that points to the rapid technological *improvement* of BEVs. As BEV technology improves, there is a considerable gap in quality between newer and older versions of the same product that puts downward pressure on BEV resale values.²⁴ This quality gap is reflected in prices and is well-known in technology markets such as smartphones that quickly depreciate as soon as a new version is launched – regardless of any change in the older version itself. Newer BEVs may also decline in price as production scales, again shifting demand from used BEVs to new BEVs and reducing resale values. Tesla's price cuts in January 2023 are a recent example of this effect.²⁵

Market oversaturation: A regulatory push rather than a demand pull

While currently there are very few BEVs on the used car market, this is expected to change with carmakers ramping up BEV production (due to the ICE phase-out and their own production targets, see Figure 1a). If this shift to BEV production outpaces consumer demand, then the used car market could become oversaturated with used BEVs thus putting downward pressure on BEV resale values.

Unknowns: A new technology in a changing context leads to a cautious approach

Uncertainty regarding products generally leads to more conservative pricing (i.e. from used car sellers). This may be particularly strong for BEVs as battery degradation is both a major source of uncertainty and a major source of product valuation. These changes can occur quickly, such as the optimism that quickly turned to pessimism regarding the future role of hydrogen cars and even PHEVs.

²⁴ Trivedi, A. (2020). The latest electric car hurdle: What if you can't resell it? Bloomberg.

<https://www.bloomberg.com/opinion/articles/2020-07-29/better-batteries-drain-resale-value-from-todays-electric-cars>

²⁵ Nedelea, A. (2023). Recent Tesla price cut will have a negative effect on resale prices. InsideEVs.

<https://insideevs.com/news/632155/tesla-price-cut-resale-values-affected/>

2.3.2. Why BEV resale values might be high

There are also multiple, competing reasons to expect high BEV resale values, from the strong value proposition, worries about the future value of ICE cars, high prices for new BEVs, and a tight BEV market.

Consumer perception of used BEVs: Low battery degradation, operational cost savings, and improving quality

In contrast to some fears, the battery degradation of BEVs is much lower than expected. Based on real-world data, there is an average degradation of battery capacity by 2.3% per year.²⁶ BEVs such as the Nissan Leaf have been on the market for over a decade, yet almost all of the batteries are still in the cars.²⁷ Consumers may or may not be aware of this battery durability.

BEVs carry a higher upfront cost than ICE cars but lower operational costs on repair, maintenance, and fuel consumption (Section 1.3). This distribution of higher upfront costs for BEVs but savings over the lifetime of the car makes BEVs an attractive proposition on the used car market where used car buyers can benefit from operational savings while avoiding the high upfront cost.

Lastly, used BEVs continue to improve in quality as newer models enter the used car market. Battery capacity and thus the range of the car – a major concern for BEVs – has improved dramatically over the past decade and thus BEV resale values are expected to increase (whereas improvements to ICE cars are more marginal).²⁸

Value proposition of (used) ICE: Worries about the future value of ICE cars

As the effects of air pollution on human health and the environment become better understood, governments are increasingly implementing low- and zero-emission zones in urban areas. There are now 320 such zones across Europe, growing to 507 by 2025.²⁹ These zones could put downward pressure on the resale values for ICE cars as owners and potential buyers worry that they will not be able to use ICE cars in urban areas,³⁰ as has already been observed in the used car market for geographies with low-emission zones.³¹ A similar readjustment took place following the ‘dieselgate’ scandal³² with diesel

²⁶ GEOTAB (2022). Electric vehicle battery degradation tool. GEOTAB.

<https://www.geotab.com/fleet-management-solutions/ev-battery-degradation-tool/>

²⁷ Reid, C. (2022). Electric car batteries lasting longer than predicted delays recycling programs. Forbes.

<https://www.forbes.com/sites/carltonreid/2022/08/01/electric-car-batteries-lasting-longer-than-predicted-delays-recycling-programs/?sh=2e52d4fa5332>

²⁸ Erich, M. (2019). Future residual values of battery electric vehicles benefit from increased range. ING Economics Department. <https://fleetmagazine.pt/wp-content/uploads/2019/07/ing-autorola.pdf>

²⁹ Transport & Environment (2022). The development trends of low- and zero-emission zones in Europe. Transport & Environment.

<https://cleancitiescampaign.org/research-list/the-development-trends-of-low-and-zero-emission-zones-in-europe/>

³⁰ Wilkinson, S. (2022). Electric car depreciation – will electric vehicles lose their value? Driving Electric. <https://www.drivingelectric.com/your-questions-answered/624/electric-car-depreciation-will-electric-vehicles-lose-their-value>

³¹ Börjesson, M., Bastian, A., Eliasson, J. (2021). The economics of low emission zones, Transportation Research Part A, 153, 99-114. <https://doi.org/10.1016/j.tra.2021.08.016>

³² Taylor, E. (2018). German diesel bans to hit resale values, report says. Automotive News Europe.

<https://europe.autonews.com/article/20180315/ANE/180319827/german-diesel-bans-to-hit-resale-values-report-says>

resale values falling below petrol in most markets³³ and leasing companies revising diesel residual values downward and other fuel types upward.³⁴

Less attractive options for new BEVs: High prices of new BEVs and subsidy phase-out

Just as a potential buyer of a used BEV may opt for a new BEV if the technology is much improved and/or if the price reduces (Section 2.3.1), the reverse is also true: if technological improvement slows and/or if the price of a new BEV increases then demand for used BEVs will increase. Forecasts suggest that BEV material costs (particularly cobalt, nickel and lithium) will remain high.³⁵ Prices for new BEVs may even increase as governments scale back purchase grants for low- and zero-emission cars. This price increase will boost demand for used BEVs and their resale value. This effect was observed in the opposite direction in July 2020 when Germany increased purchase grants for new BEVs causing prices for used BEVs to fall.³⁶

Tight BEV market pushes consumers to the used car market

While the supply of new BEVs is quickly increasing, the supply of used BEVs has an inherent lag leading to a tight market and high BEV resale values.³⁷ Furthermore, supply chain disruptions in car manufacturing have significantly added to wait times for new BEVs. If these trends persist, used BEVs offer a more cost competitive and timely option to BEV procurement, thus pushing demand and BEV resale values higher. This market dynamic is in direct opposition to the concern about market oversaturation (Section 2.3.2).

Any one factor or multiple factors that have been hypothesised to push BEV resale values up or down might prove dominant – or even factors not yet considered. However it is not purely a theoretical question. Several years of used BEV sales, analysed in the next section, provide important evidence on the evolution of BEV resale values and offer explanations for the trends.

³³ Autovista24 (2019). Diesel registrations and RVs outperform petrol in Germany. Autovista Group.

<https://autovista24.autovistagroup.com/news/diesel-registrations-and-rvs-outperform-petrol-germany/>

³⁴ Fleet Europe (2018). When will diesel residual values stabilise? Fleet Europe.

<https://www.fleeteurope.com/en/remarketing/europe/analysis/when-will-diesel-residual-values-stabilise>

³⁵ BNEF (2022). Increase in battery prices could affect EV progress. Bloomberg New Energy Finance.

<https://about.bnef.com/blog/increase-in-battery-prices-could-affect-ev-progress/>

³⁶ Autovista24 (2021). Portfolio effect stabilises residual values of BEVs. Autovista Group.

<https://autovista24.autovistagroup.com/news/portfolio-effect-stabilises-residual-values-bevs/>

³⁷ Erich, M. (2019).

3. BEV resale values are converging with other powertrains

As sales of used cars predominantly take place online, there are millions of used car prices that provide insight into how cars depreciate over time. Automotive journalists and analysts have used these online prices to offer partial evidence, mostly from the American market, on the resale value of BEVs and how these values compare to other powertrains. The conclusions from these articles are that BEV resale values vary significantly by brand (e.g. Tesla is consistently high), with mixed results as to whether BEV resale values are higher or lower than other powertrains. There thus remains an important research gap to provide a detailed account of the European market that is across countries, over time, and accounts for important factors including car segment and brand.

For the following analysis, the Autovista Residual Value Intelligence (RVI) tool is used. It is one of the most comprehensive datasets on used car prices with tens of millions of data points and is used by leasing companies in their process of residual value setting (Section 2.1). The RVI tool is populated with Autovista residual values that are market-weighted by data primarily provided by used-car portals.

The following analysis covers used car sales from 14 segments and 42 brands, powered by the five major powertrains (petrol, diesel, HEV, BEV, PHEV), with 16 age and mileage combinations, in the five largest European car markets (Germany, France, UK, Italy, Spain), over five and a half years (January 2017 to June 2022), for a total of 2.7 million datapoints. As the RVI tool does not include purchase grants in the original purchase price, the BEV resale values were recalculated to include purchase grants for corporate registrations by country and price threshold.

The following sections analyse the results over a standard 36 month leasing period (Section 3.1), a 12 month period to cover the newest models (Section 3.2), and the variation based on car age, mileage, segment, and brand (Section 3.3).

3.1. BEV resale values have converged with ICE in most European countries

In this section, a car with 36 months of ownership is used to represent a typical lease contract. Both resale value percentage, which is measured as the used car price as a share of the new car price,³⁸ and depreciation cost, which is measured as the difference between used car price and the new car price, are analysed. An analysis of resale values in absolute terms (i.e. the used car price) is available in Annex A.

Resale value percentage

Over the past five years, BEV resale values have been steadily increasing (Figure 5). While there is a general upward trend in resale values across all powertrains (as car models have improved and supply has tightened), the ascent of BEV resale values begins earlier and has a larger total increase over the entire time period.

³⁸ The new car price is calculated from the resale value in absolute terms and the resale value in percentage terms from the RVI tool. It is equivalent to the manufacturer's suggested retail price.

Average resale values for BEVs are developing along different pathways in the five major car markets. The largest increase in BEV resale value is in Spain (25 p.p.) and the smallest is in Italy (0 p.p.). BEV resale values have reached a point of convergence with other powertrains in Germany and the UK, while in France and Spain BEV resale values are lower than other powertrains but ascending quickly. In Italy there is no clear trend.

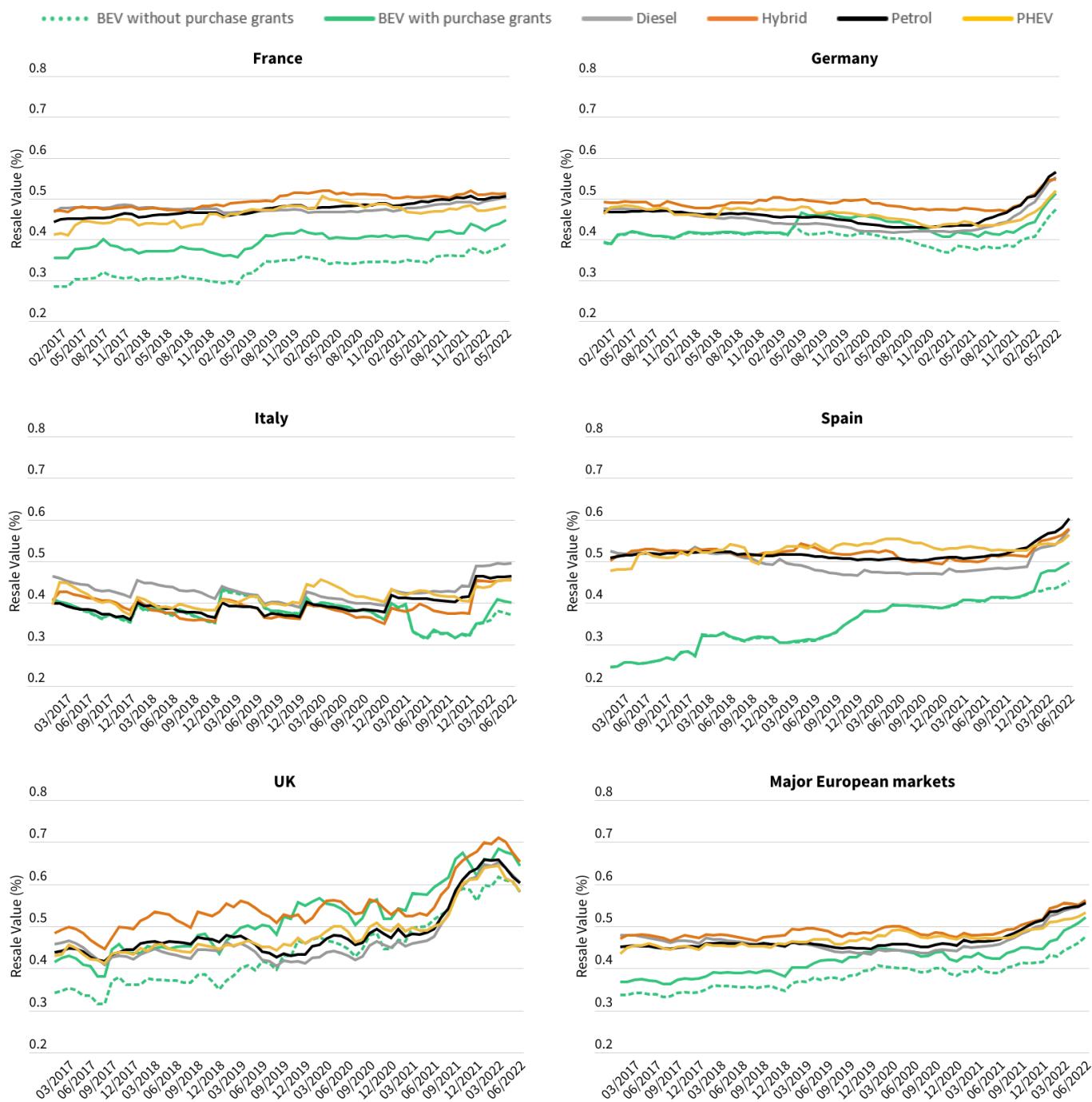


Figure 5: BEV resale value over 36 months is nearing convergence with other powertrains

Source: T&E analysis based on Autovista Residual Value Intelligence tool.

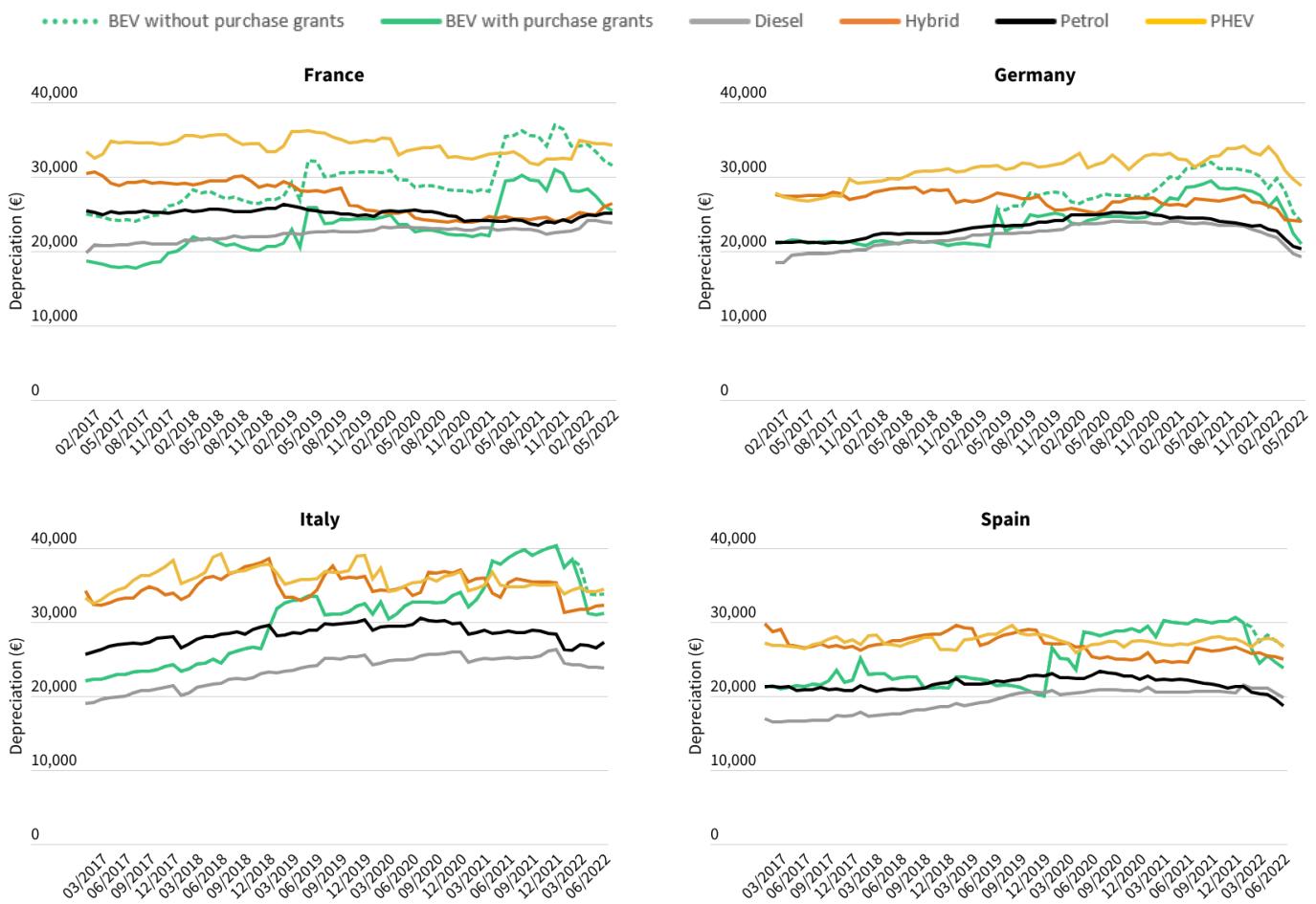
Notes: Cars with an age of 36 months, all mileage options.

A briefing by

Depreciation cost

Depreciation cost is the absolute complement of resale value in that it measures value loss (the difference between used car price and the new car price) rather than value retention (used car price). For leasing companies, depreciation cost is the most relevant measure as their business model is to charge lessees for the (expected) depreciation cost of a car over the leasing period (see Section 2.1). If BEVs have higher depreciation costs than other powertrains, then leasing companies must offer BEV leases at a higher monthly rate to remain profitable.

Like the previous results on resale value percentage, average depreciation costs for BEVs in Germany and the UK have converged with diesel and petrol (Figure 6). France, which has lower resale value percentages for BEVs, also sees convergence between BEVs and other powertrains with respect to depreciation cost. For Spain and Italy, there is still a gap in depreciation cost between BEVs and petrol and diesel, but it has narrowed in recent months. PHEVs depreciate significantly and have the highest average depreciation cost in all major European car markets.



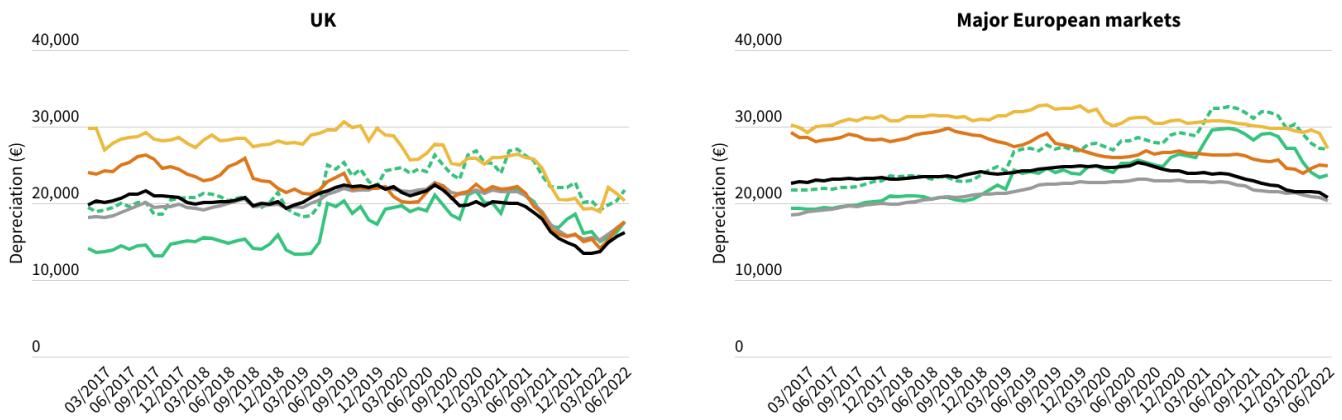


Figure 6: BEV depreciation cost over 36 months is higher than petrol and diesel, lower than hybrids

Source: T&E analysis based on Autovista Residual Value Intelligence tool.

Notes: Cars with an age of 36 months, all mileage options.

3.2. BEV resale values are even stronger for the newest models

The market for BEVs is constantly evolving, especially as newer, more technologically advanced models are introduced. To analyse the possibility that newer BEV models have a different depreciation and resale value profile compared to older models, this section analyses cars with 12 months of ownership (with any mileage) rather than 36 months (with any mileage). A 12 month ownership period includes models that debuted June 2021 or earlier, whereas the most recent datapoints in the 36 month dataset cover sales from June 2019 – before many of the currently best-selling BEVs were launched (e.g. VW ID.3, VW ID.4, Tesla Model Y, Skoda Enyaq).

Resale value percentage

The resale value percentages based on a 12 month ownership period (Figure 7) are distinct from the 36 month period (Figure 5). Whereas the resale value percentage for BEVs with a 36 month ownership period have converged with other powertrains in two markets (Germany and the UK) and are approaching convergence in two others (France and Spain), BEVs with a 12 month ownership period have higher resale values compared to other powertrains for Germany and France and are on par in the other three markets (Italy, Spain and the UK).



Figure 7: BEV resale value over 12 months has converged or exceeded other powertrains

Source: T&E analysis based on Autovista Residual Value Intelligence tool.

Notes: Cars with an age of 12 months, all mileage options.

Depreciation cost

Shortening the analysis to include the newest models has a similar effect on depreciation cost, where BEVs after 12 months of ownership (Figure 8) now have the same level of depreciation in Italy, Spain and the UK. For Germany and France, the depreciation cost of BEVs is the lowest of all powertrains.

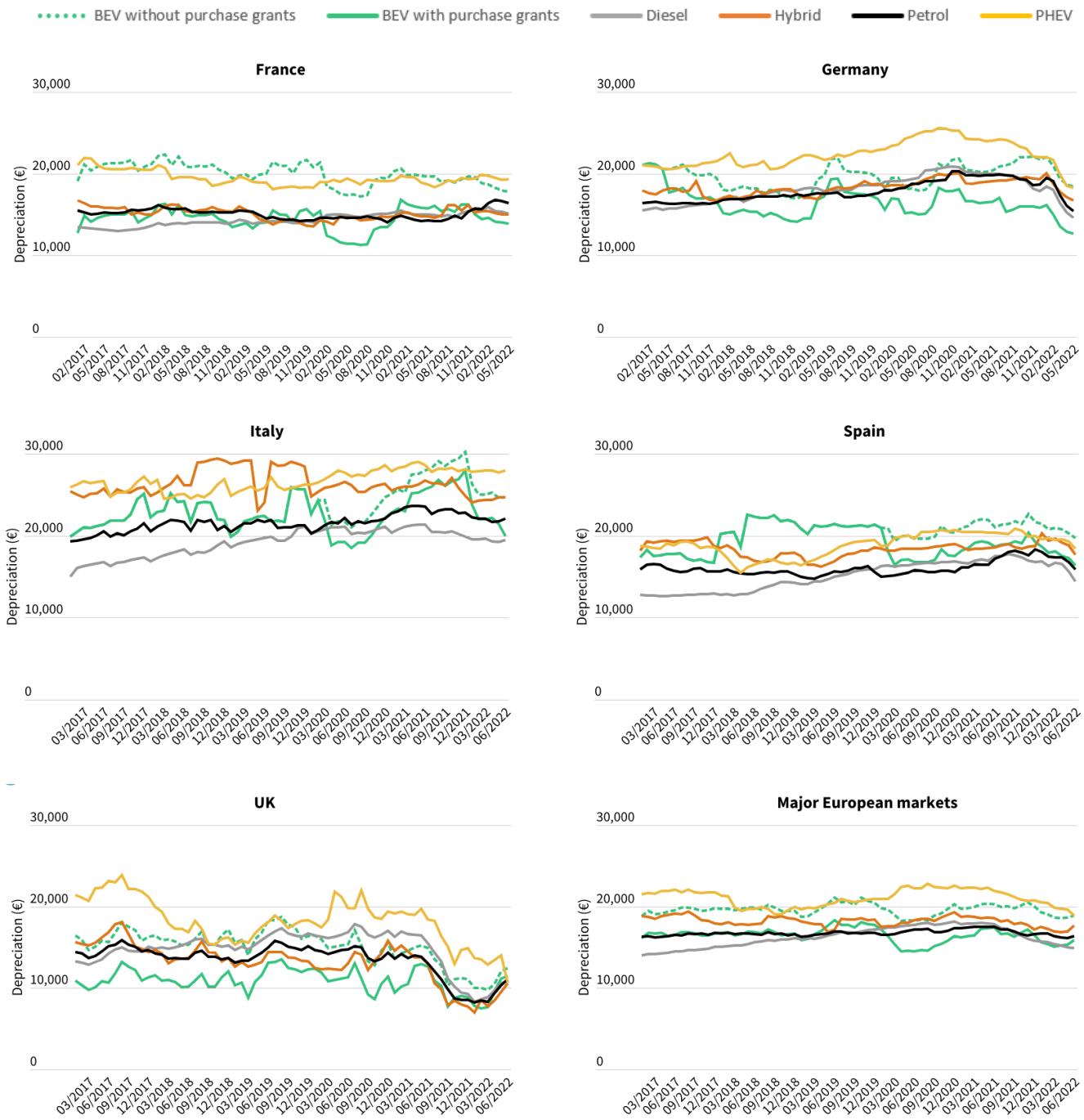


Figure 8: BEV depreciation cost over 12 months has converged or fallen below other powertrains

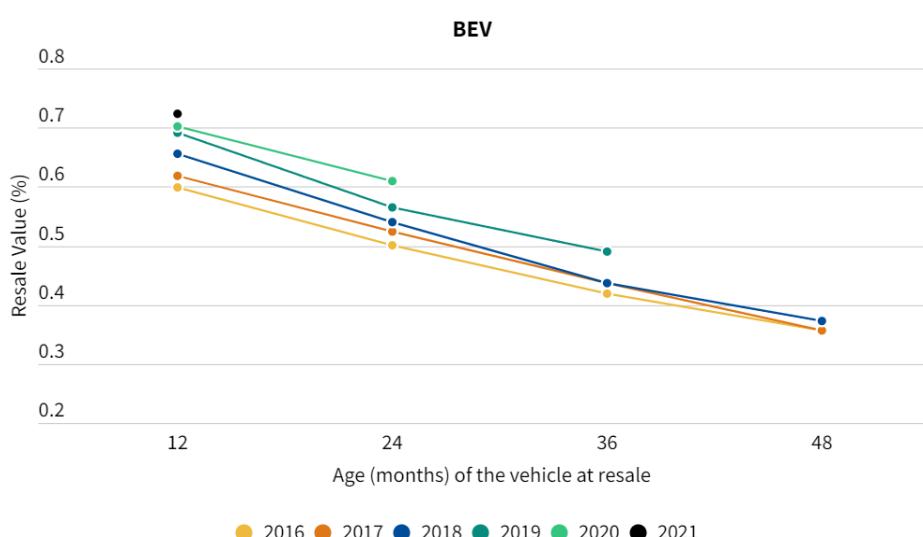
Source: T&E analysis based on Autovista Residual Value Intelligence tool.

Notes: Cars with an age of 12 months, all mileage options.

There are two alternative explanations for the stronger relative performance of BEV resale values after 12 months compared to 36 months. One explanation is an age effect, where BEVs are valued highly compared to other powertrains after 12 months but lose more value than other powertrains as the cars age. An alternative explanation is a compositional effect of the models included in each year, where a 12 month period includes the latest BEV models and a 36 month period includes earlier models.

These two alternative explanations can be partially distinguished by following the evolution of resale value percentage by year of first sale (e.g. in Figure 9 the yellow line illustrates cars that were first sold in 2016 and their subsequent resale value percentage in 2017, 2018, 2019, and 2020). If it is an age effect, then each subsequent year of models will have the same resale value percentage as the year before (e.g. in Figure 8 the coloured lines will be completely overlapping). If it is a model effect, then the resale value percentage should be rising over time as newer models become available (e.g. in Figure 9 each coloured line will be above the previous line).

The analysis reveals that for BEVs, there is a distinct year effect where each subsequent year, BEVs are achieving higher resale values. On average, the resale value increases by 2.5 p.p. each year, emphasising the importance of launch year and BEV model improvement. Petrol cars do not have the same trend. For almost all the year classes, there is no significant increase in the resale value with the exception of 2021. This result is due to the 2022 market where car shortage caused resale value to spike in the UK and Germany.



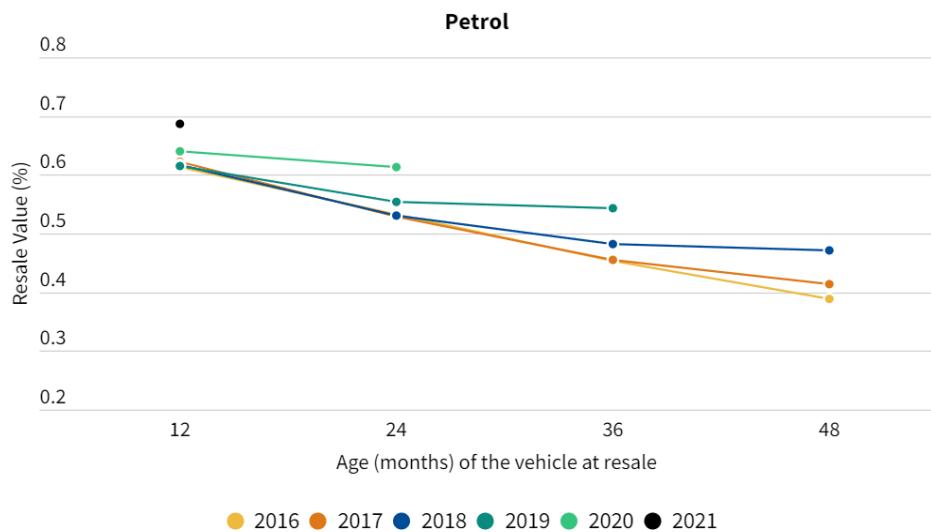


Figure 9: Following the evolution of resale value by year of first sale

Source: T&E analysis based on Autovista Residual Value Intelligence tool.

Notes: Cars with all mileage options.

The importance of newer BEV models is also observed at the brand level (the dataset is not disaggregated at the model level). There are many examples of brand resale value percentages spiking after the new models have been introduced on the market (i.e. a spike in the 12 month resale values exactly 12 months after the model has debuted). For example the debut of the Peugeot e-208 in October 2019 led to a spike in resale value percentage in October (Figure D1). Even newer versions of the same model can lead to spikes in resale value percentage in January the following year, including the 2018 and 2020 versions of Nissan Leaf and the 2017 version of Renault ZOE (Figure D1).

3.3. Testing the results by car age, mileage, segment, and brand

The previous analysis compared BEVs and other powertrains *on average*, but there may be cases where the results no longer hold in general. Four key car attributes that may interact with the results by powertrain – age, mileage, segment, and brand – are analysed in this section and in the report Annex.

Age

Depreciation increases as cars age and BEVs depreciate faster and to a larger degree than other powertrains (Figure E1). This effect is particularly strong in Italy and Spain.

Whereas in the previous section, BEVs with 36 months of ownership are close to convergence with other powertrains in terms of depreciation (Section 3.1), BEVs depreciate more than other powertrains after a longer time period (e.g. 48 months) and less after a shorter time period (e.g. 12 months as in Section 3.2). Some of this effect is due to the cars themselves losing value and some is due to a changing composition of cars with older BEV models less valuable than newer BEV models (Section 3.2).

Mileage

Depreciation also increases as cars are driven more, and again BEVs depreciate more with usage compared to other powertrains with the largest effect in Italy and Spain (Figure F1). The difference in depreciation between BEVs and other powertrains as they add more mileage is smaller – in some cases even minor – than the same comparison based on car age (i.e. an additional 20,000 kilometres in mileage has a smaller relative impact on BEV depreciation than extending ownership by another 12 months).

Segment

Resale values differ significantly between car segments, with larger car segments (particularly SUVs) keeping more of their value as these cars are in high demand (Table G1). For BEVs with an ownership of 36 months, the resale value percentage is higher than other powertrains for premium segments (e.g. D and E segment) but lower than other powertrains for small segments (e.g. A, B, C segment). This picture changes when looking at car models with an ownership of 12 months. For most segments (7 of 11), the resale value percentage of BEVs is higher than petrol.

Brand

Resale values also differ significantly between brands, with premium brands keeping more of their value as they age (Table H1). For 36 month old BEVs, Tesla has achieved high resale values whereas for other major brands (e.g. VW, Peugeot and Citroen) the resale values of electric cars are still lower compared to their petrol models. These results align with segment-level results as Tesla has a significant share of the used car market for BEVs in the premium segments.

When analysing newer models - i.e. an ownership period of 12 months - this lower BEV release value percentage almost entirely disappears for car brands. For the majority of car brands (e.g. VW, Peugeot, Citroen, Mercedes-Benz, Fiat and Volvo) the resale value percentage of their 12 month old BEV models is higher than their petrol cars. This again underlines the importance of newer BEV models entering the market and their effect on the resale values of electric cars.

3.4. Summary of findings

For cars with 36 months of age, i.e. a standard leasing period, BEV resale values have converged with other powertrains in Germany and the UK and are approaching convergence in France and Spain. No clear trend is observed in Italy. These national results are also reflected in absolute resale value (i.e. the price of a used car) and depreciation cost (i.e. the reduction in price from new to used).

For 2022, the average depreciation cost for BEVs with 36 months of age is more than petrol (€25,204 compared to €21,461). The absolute resale value is slightly higher (€26,027 compared to €25,097) but the resale value percentage is lower (51% compared to 54%). These results vary between European markets (Figure 10a).

36 months old vehicles

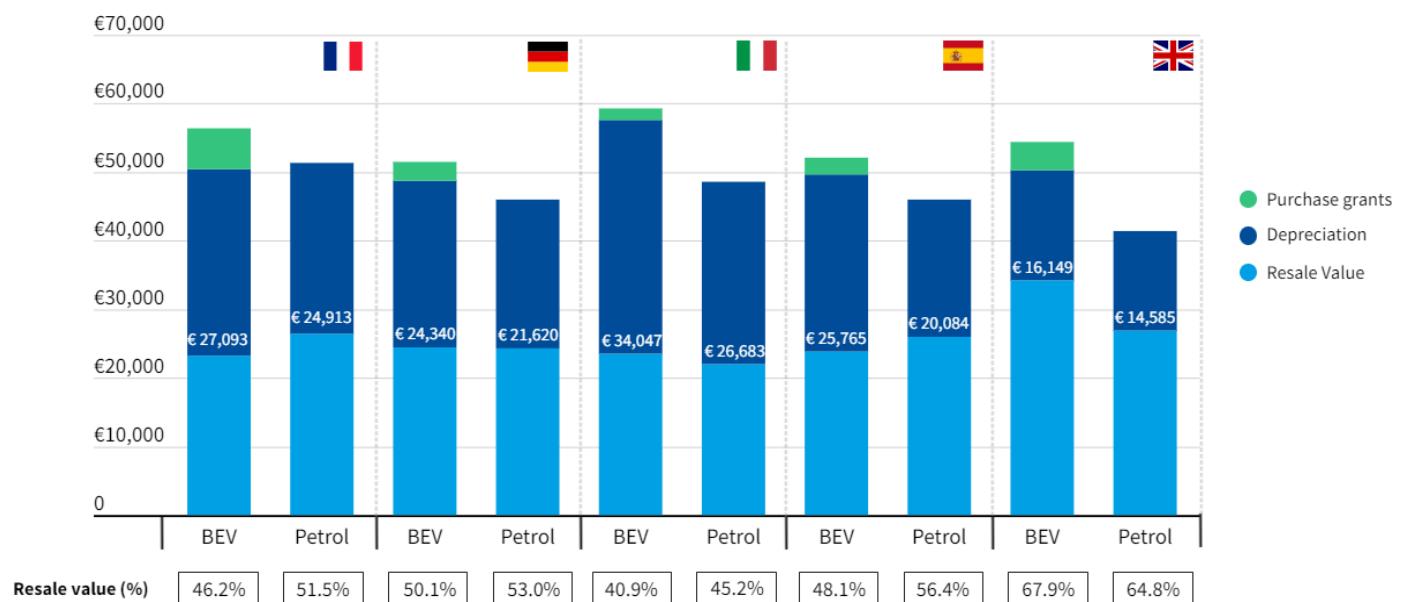


Figure 10a: Summary graph of the current situation in H1 2022 for 36 month old cars

Source: T&E analysis based on Autovista Residual Value Intelligence tool.

Notes: Cars with an age of 36 months, all mileage options.

For cars with 12 months of age, which includes the latest BEV models, BEV resale values are even stronger. In major car markets like France and Germany, rather than convergence, newer BEVs have higher resale values than other powertrains. This difference highlights the important technological advancements in BEVs and provides a strong signal about the future resale value of current BEV models. BEV resale value convergence is also observed for cars with 12 months of age across nearly all brands and segments.

For 2022, the average depreciation cost for BEVs with 12 months of age is less than petrol (€15,035 compared to €16,454). Both absolute resale value (€40,515 compared to €36,055) and resale value percentage (72.8% compared to 68.7%) are higher. These results vary between European markets (Figure 10b).

12 months old vehicles

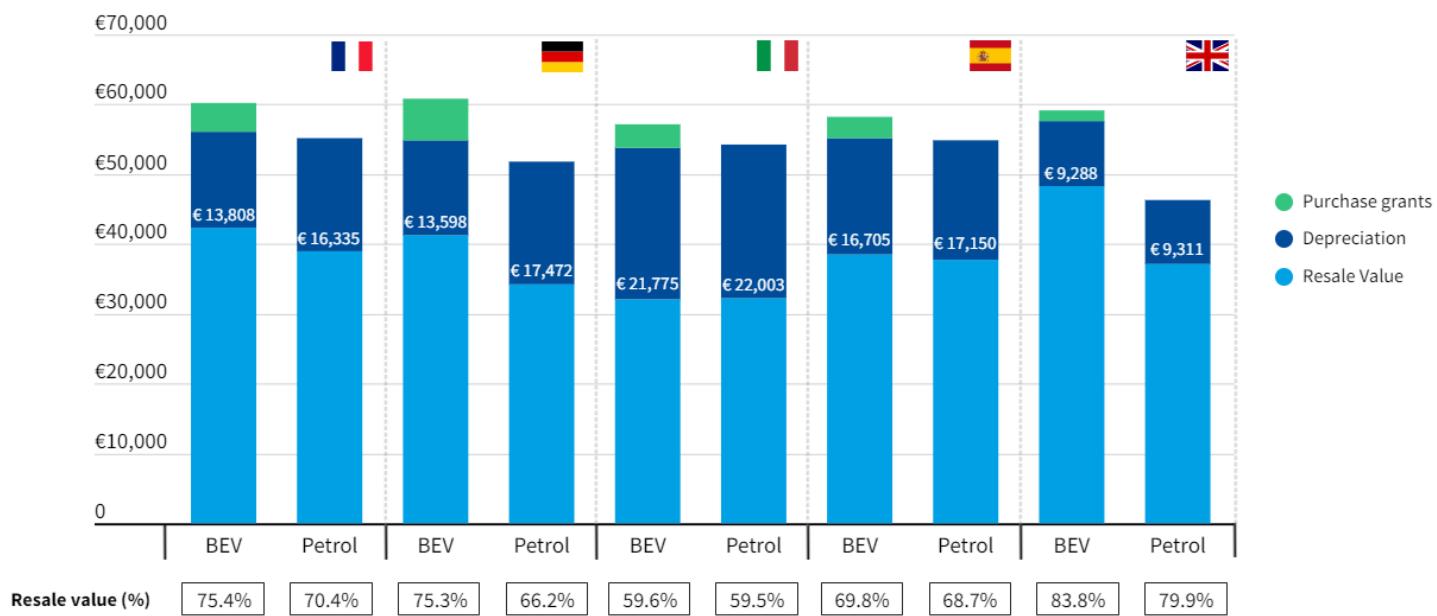


Figure 10b: Summary graph of the current situation in H1 2022 for 12 month old cars

Source: T&E analysis based on Autovista Residual Value Intelligence tool.

Notes: Cars with an age of 12 months, all mileage options.

Table 2: Summary of resale value findings with respect to different car attributes

Analysis	Findings	Results
Resale value (%)	<ul style="list-style-type: none"> • BEV resale value percentage is increasing in most major European car markets. • BEV resale value percentage has converged with other powertrains in Germany and the UK and is nearing convergence in Spain and France. • Purchase grants reduce the new price of BEVs and therefore increase BEV resale value percentage. 	Figure 5
Depreciation (€)	<ul style="list-style-type: none"> • BEV depreciation cost has converged with other powertrains in most major European car markets. 	Figure 6
Car attribute: Newer models	<ul style="list-style-type: none"> • BEV resale value percentage has not only converged but exceeded other powertrains. • BEV depreciation cost has fallen below other powertrains in France and Germany. • Resale value percentage at the brand level can spike when new BEV models are launched (less so for other powertrains). • BEV resale values have increased with each subsequent year sale, revealing the importance of launch year (rather than car age). 	Figures 7-9, C1, D1
Car attribute: Age	<ul style="list-style-type: none"> • Age generally depreciates cars more than mileage. • BEVs depreciate more with age compared to other powertrains. 	Figure E1
Car attribute: Mileage	<ul style="list-style-type: none"> • Mileage generally depreciates cars less than age. • BEVs depreciate more as they are driven compared to other powertrains, but the difference is minor (i.e. BEVs are penalised more for age). 	Figure F1
Car attribute: Segment	<ul style="list-style-type: none"> • Resale value percentages (and absolute value) are generally higher for larger segments, particularly SUVs. • 36 month old BEVs have lower resale value percentages for A, B, and C segments compared to petrol cars but this trend disappears for 12 month old cars. • The difference between BEV and petrol depreciation cost is larger when analysed at the segment level. This reflects the fact that the average BEV is from cheaper segments than the average petrol car (section 3 results). 	Tables G1, G2
Car attribute: Brand	<ul style="list-style-type: none"> • Tesla has the highest resale value percentage for 36 month old BEVs, but almost all carmakers have similar resale value percentages for 12 month old BEVs. • For major car brands, petrol resale value percentages are higher than BEV resale value percentages for 36 month old cars, but the result reverses for 12 month old cars. 	Table H1

4. With strong BEV resale values, where are the zero-emission leaders?

The below section validates and revisits - using the findings of the analysis on used car prices (Section 3) - the theories about why BEV resale values may be high or low (Section 2.3.) and our results of the leasing deals for BEVs (Section 2.2.).

4.1. Interpreting the results

These results shed light on some of the theories advanced about why BEV resale values may be low (battery degradation, product improvement, market oversaturation, and uncertainty) or high (product quality, restrictions on ICE cars, high BEV prices, and supply constraints).

Market dynamics

First, the high resale values for BEVs reveal that there is **high demand for used BEVs**. The change over time is particularly strong for the absolute resale value (i.e. the price of the used car), indicating that the quality of used BEVs is perceived to be improving. This relates to some aspect of product quality for used BEVs, be that their lower price point compared to new BEVs, or their lower operational costs, lower emissions, and/or their lack of driving restrictions compared to other powertrains.

Secondly, the high BEV resale values highlights the **tight market for used BEVs**, as opposed to market oversaturation. The logic behind this result is clear. Whereas the supply of new cars is closely calibrated to match consumer demand, the supply of used cars lags behind, reflecting consumer demand from years past. Currently BEVs represent just over 10% of new production in Europe but less than 1% of the used car market. This **lagging supply of BEV for used car buyers will, by definition, continue throughout the transition**, meaning low depreciation for BEVs in leasing company fleets.

Consumer perception

Thirdly, the results show the importance of **product improvement in newer BEV models**. However, rather than new generations of BEVs eroding the value of older generations, – each year of BEV models is taking resale values to new heights (Figure 9) while resale values of older BEV models also grows. Unlike the market for smartphones, the car market is in a unique situation where BEVs are an extremely small share of the used car market (<1%) meaning consumers still struggle to acquire *any* BEV – especially when the **market for new cars is constrained by supply chain disruptions**.

Finally, the results support the idea that **consumers are becoming comfortable with the battery durability of used BEVs**. Additional mileage, which is linked to concerns about battery degradation, does not significantly lower the resale value of BEVs compared to other factors like car age. While concerns about battery degradation are frequently expressed, it may be that information about battery durability is reaching used car consumers.

4.2. Why are leasing deals for BEVs still so expensive?

The finding that average BEVs have depreciated by a similar amount as other powertrains (Section 3) contrasts with leasing deals where BEVs are still much more expensive (Section 2). As leasing companies charge customers for the depreciation of a car (and other services are the same amount or cheaper for BEV), the additional BEV depreciation cost and the additional leasing cost for a BEV should be comparable.

Comparing the additional leasing cost and depreciation cost for BEVs

In four of the five markets (UK, Germany, France and Spain) the additional leasing cost for BEVs is much higher than the additional depreciation cost for BEVs over 36 months, with the largest difference in Spain (Table 3). Italy is the only country where additional leasing cost for BEVs is lower than the additional depreciation cost for BEVs.

Table 3: Comparison of average BEV and petrol leasing costs and actual depreciation costs

Country	Additional leasing cost for BEVs compared to petros (€)	Additional depreciation cost for BEVs compared to petros (€)
France	7,836	3,007
Germany	9,049	4,088
Italy	7,670	9,753
Spain	9,599	5,938
UK	7,700	2,101
Major European markets	8,371	4,878

Source: T&E analysis based on leasing deals and depreciation in the Autovista Residual Value Intelligence tool.

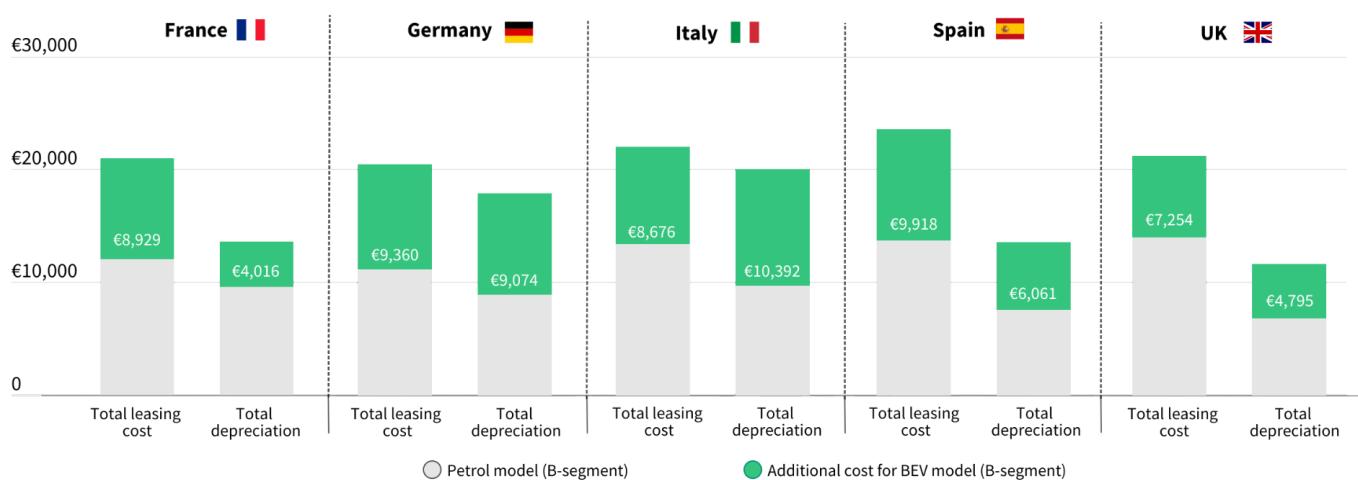
Notes: The costs for leasing deals include a Peugeot 208 and e-208, Renault Clio and ZOE, VW Golf, ID.3, Tiguan, and ID.4. Calculations include national purchase grants for corporate registrations. The depreciation costs are for cars with an age of 36 months (all mileage options) in the B, C, and C SUV segments (to mirror the leasing deals).

Comparing the additional leasing cost and depreciation cost for BEVs at the segment level

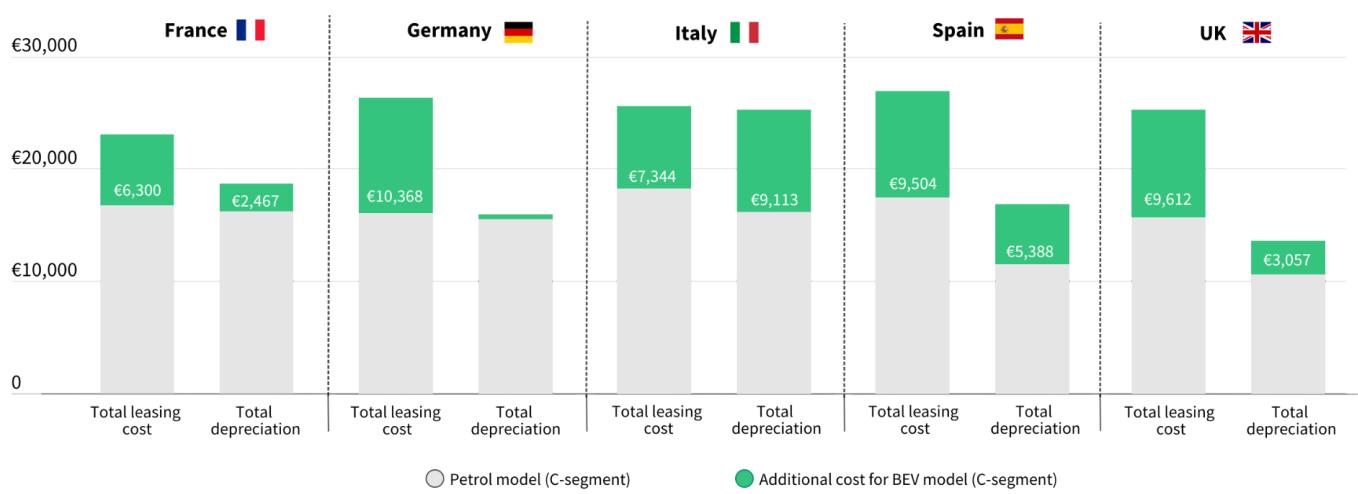
As the leasing deals were acquired for specific models, the comparison can be further specified by only comparing the additional leasing cost to the depreciation cost for the same car segments as the leasing offers: B, C, and C SUV.³⁹ Here the same results emerge where for the Renault Clio and ZOE leasing deals (compared to B segment depreciation), the Peugeot 208 and e-208 leasing deals (compared to B segment depreciation), the VW Golf and ID.3 leasing deals (with C segment depreciation), and the VW Tiguan and ID.4 leasing deals (compared to C SUV depreciation): in four of the five markets the additional leasing price for BEVs is much higher than additional depreciation cost for BEVs (Figure 11).

³⁹ The depreciation results were not limited to the same brand as so few (and sometimes zero) BEVs were available for a specific brand and a specific segment with 36 months of age.

Leasing rates and depreciation: Petrol vs BEV (B-segment)



Leasing rates and depreciation: Petrol vs BEV (C-segment)



Source: T&E analysis based on Autovista Residual Value Intelligence tool.

Notes: Lease offers of 36 months and 60,000km (based on offers for a VW ID.3 and a VW Golf). The depreciation rates are calculated on C-segment vehicles.

Leasing rates and depreciation: Petrol vs BEV (C-SUV segment)

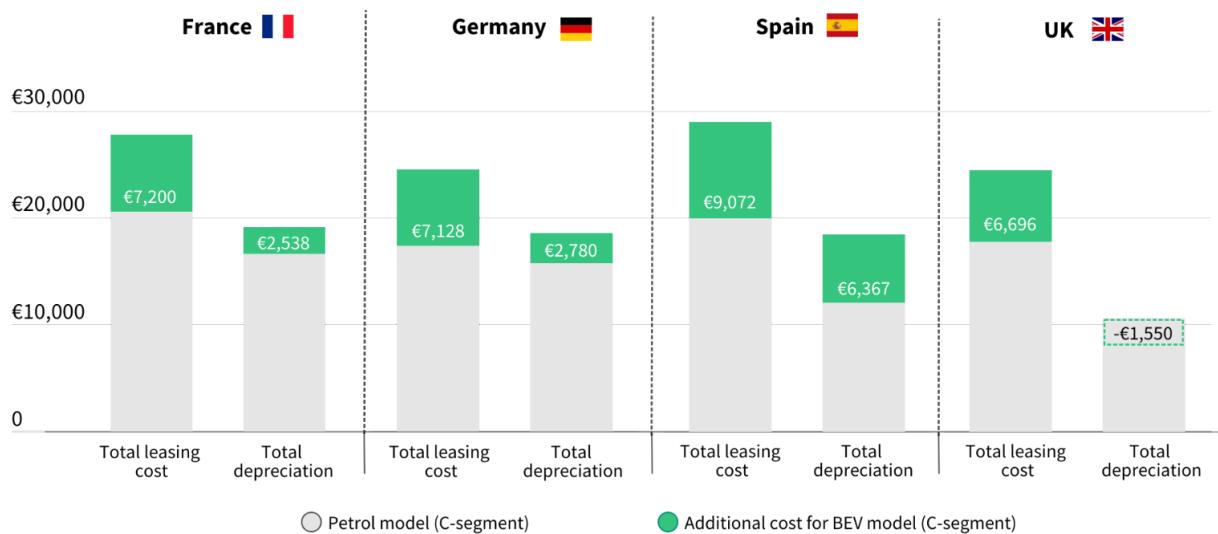


Figure 11: Comparison of BEV and petrol leasing deals and depreciation by segment

Source: T&E analysis based on Autovista Residual Value Intelligence tool and T&E analysis of leasing deals.

Notes: Cars with an age and 36 months, all mileage options. The leasing deals include a Peugeot 208 and e-208, and a Renault Clio and ZOE for the B segment comparison, a VW Golf and ID.3 for the C segment comparison, and a VW Tiguan and ID.4 for the C SUV segment comparison. Depreciation cost is calculated for each segment. There is no data on depreciation cost in Italy for the C SUV segment with 36 months of age. Calculations include national purchase grants for corporate registrations. Images were kindly provided by IMAGIN.studio, the world's no1 data driven car image solution for automotive marketing endeavours. All copyrights on car imagery are reserved by IMAGIN.studio.

More info at www.imagin.studio

This misalignment between BEV leasing deals and BEV resale values presents a provocative question for leasing companies: *why are leasing deals for BEVs still so expensive?* There are multiple, interacting factors.

Profit maximisation from a limited supply

The car market is in a unique situation where supply cannot be quickly increased due to production timelines and supply chain disruptions. This prevents typical market strategies of reducing price and increasing volume. Instead, the profit maximising strategy of a supply-constrained leasing company is to keep prices as high as possible for the available supply. Carmakers themselves also have a role in directing their cars through different market channels, including their captive leasing channels (see Table 1), to maximise their profits.

While this market strategy is expected economic behaviour, it is not without consequence. Leasing customers are paying more for BEVs than they would otherwise, and fewer BEVs in the leasing channel slows the flow of BEVs to the used car market and therefore to middle and lower-income households. This

market strategy is also not a full explanation, as leasing deals for BEVs were much more expensive than other powertrains even before the supply chain disruptions and longer wait times.

A cautious approach to new technology leads

BEVs, especially used BEVs, are still a relatively young phenomenon. This means that there is less data and real-world experience available compared to for example used petrol and diesel cars. This can lead to leasing companies being more cautious when setting the resale prices and leasing deals of BEVs.

The experience of leasing companies with BEVs may have ingrained an institutional scepticism towards the technology that has not kept pace with the changing technology. In 2017, the earliest point in the dataset, BEVs resale values were low across markets, age, distance, and other car attributes. Leasing companies faced a difficult remarketing challenge for these early BEV models and these early experiences may have shaped the views of managers within leasing companies. Even as BEV models improve and the trends in BEV resale values change shape, if these early BEV models lost money for leasing companies then a scepticism about the technology may still persist.

The institutional culture of leasing companies

There is also a conservative financial culture within leasing companies when faced with uncertainty (many of the largest leasing companies are owned by multinational banks, see Table 1). Leasing companies may be concerned that some of the positive drivers for BEV resale value may cease, or that new drivers could counteract some of these effects. Moreover many of the more senior staff working at leasing companies have only had experience dealing with petrol and diesel cars and might have a certain degree of scepticism towards a new technology such as BEVs. Voices in the car industry, including some from leasing companies themselves, have pointed to this institutional conservatism as a key factor holding back the zero-emission transition.⁴⁰

4.3. Conclusions and policy recommendations

The need to transition to net-zero emissions has shone a spotlight on the automotive industry, but the light has yet to reach leasing companies who remain extremely large, extremely profitable, and operate in the dark.

In their own communications, leasing companies comment on the zero-emission challenge via two positions: first, that they are environmental leaders championing the EV transition within the auto industry, and second, that their industry change is ultimately driven by consumers who choose which car they would like to lease.

The first claim of environmental leadership is not credible. Only one of the major leasing companies has a zero-emission target and none of the companies will disclose their current share of zero-emission cars. Instead, leasing companies set ‘EV targets’ and disclose their ‘EV share’ that include high emitting PHEVs.

⁴⁰ Campbell, P. (2022). Switch to electric cars held back by costly leasing deals. Financial Times.

<https://www.ft.com/content/85d36e57-fc30-47a9-ae3a-599e601d2f63>

Moreover, by applying a conservative pricing strategy (especially looking at the high resale values of battery electric cars), consumers are facing much higher prices for BEVs and leasing firms are in this way holding back the zero-emission transition.

Even at the most fundamental level there is a contradiction between the two positions presented. If consumers had all the market power, then *any* sales target from leasing companies – including EV targets – would be meaningless. It is also a fundamental contradiction with the existence of several ‘captive leasing companies’ that steer consumers towards the carmaker that owns the leasing company.

Leasing companies have the size, profitability, and power to back up their CSR claims and lead the European car market in the zero-emission transition. Leasing companies should:

- **Set timely and ambitious targets** for their transition to an electric future meaning committing to 100% BEV registrations in 2027 and a 100% BEV fleet in 2030.
- **Review their residual value setting process and pricing strategies** in light of today's discrepancy between high BEV leasing deals and low BEV depreciation in used car sales.
- **Publicly support and advocate for company car tax reforms** at a national level (to incentivise uptake of fully electric cars) and an **EU fleet mandate** of 100% BEVs by 2030.
- **Disclose their annual uptake** of BEVs to create more transparency for investors and other stakeholders.
- **Provide more transparency for consumers** by clearly communicating on their website the actual leasing prices including taxes and subsidies, the estimated total cost of ownership, and the real-world emissions of the cars they are leasing.

Other actors also have a key role to support leasing companies in taking on this new role:

- Data providers provide information to leasing companies – and increasingly to the public – on the used car market. This information should be relevant and accurate, for example including purchase subsidies in the calculation of resale value percentage and depreciation.
- All stakeholders should be supporting initiatives to help consumers understand the value proposition of used BEVs, for example the development of a standardised battery state-of-health certificate being developed by the European Car Remarketing Association.
- Carmakers also have a role in facilitating the market for used BEVs. While most carmakers have battery warranties (typically eight years), over-the-air updates, and will certify pre-owned EVs, only some carmakers offer some sort of trade-in value for used cars or used EV warranty extensions.
- Like other parts of the car industry, the leasing sector with its opaque pricing system is due for disruption. This could come from new business ventures or even public organisations like the ‘social leasing model’ being developed in France.

Further information

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A briefing by

Annex A: Resale value in absolute terms (36 months)

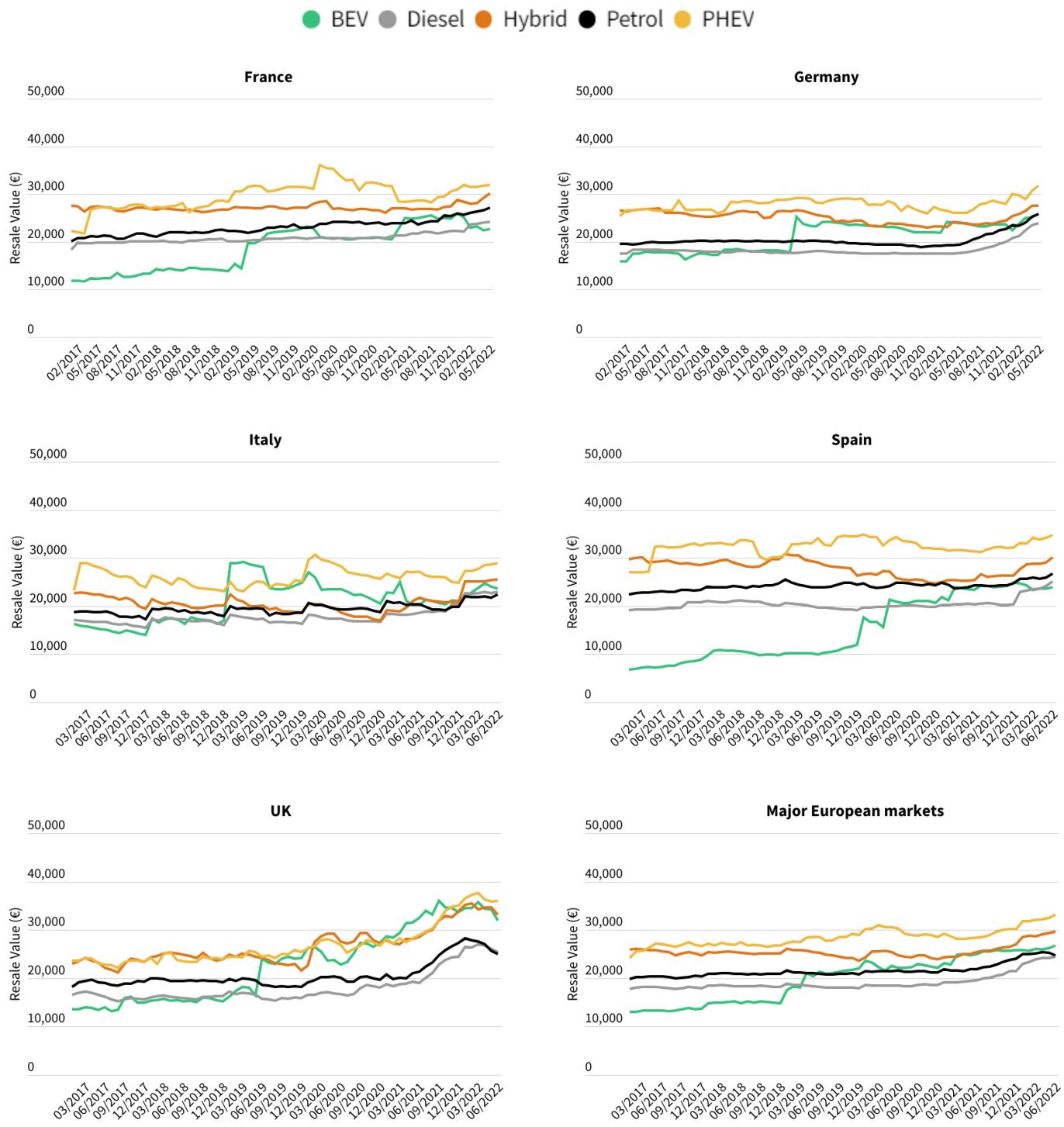


Figure A1: BEV resale value has converged with other powertrains

Source: T&E analysis based on Autovista Residual Value Intelligence tool.

Notes: Cars with an age of 36 months, all mileage options.

A briefing by

Annex B: Resale value in absolute terms (12 months)

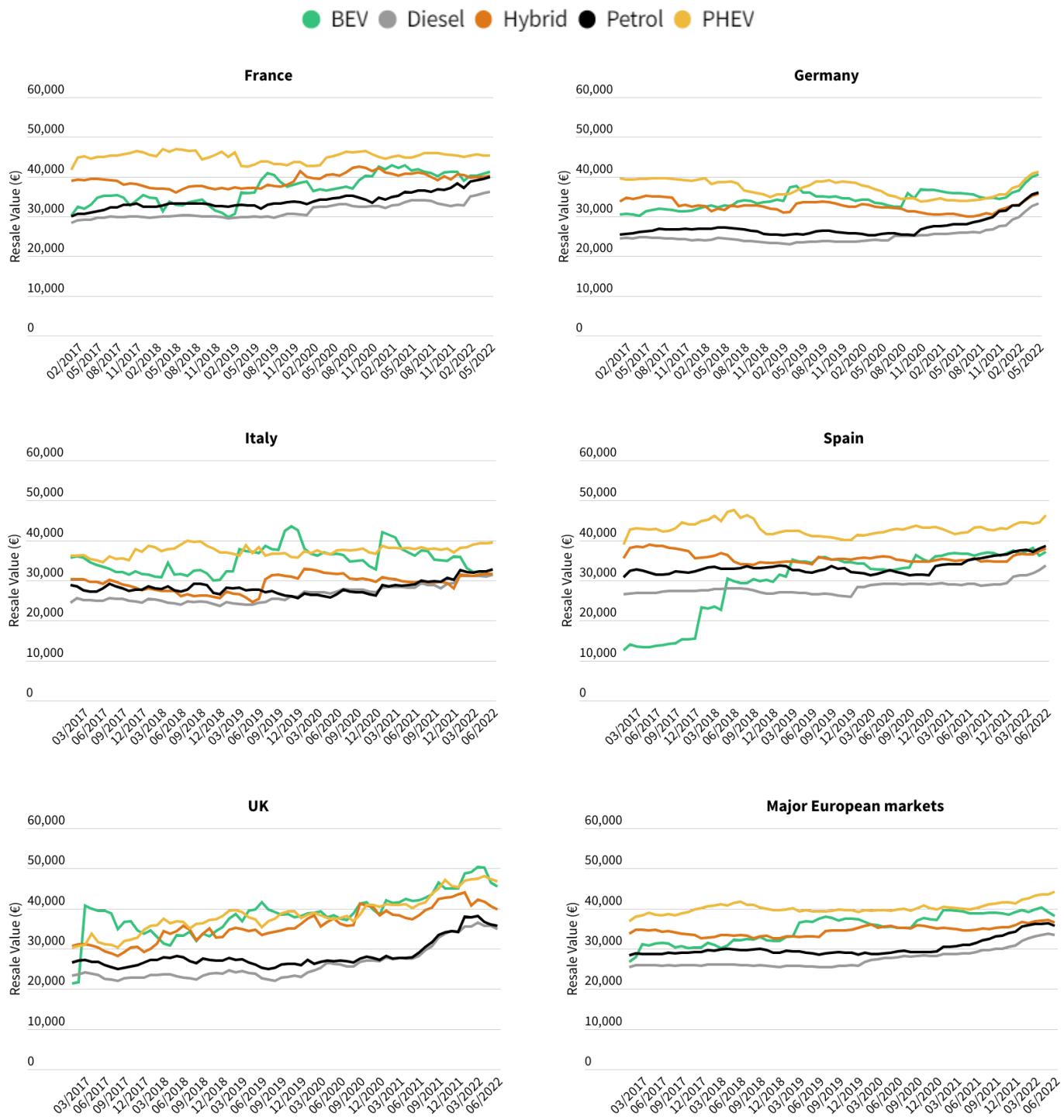
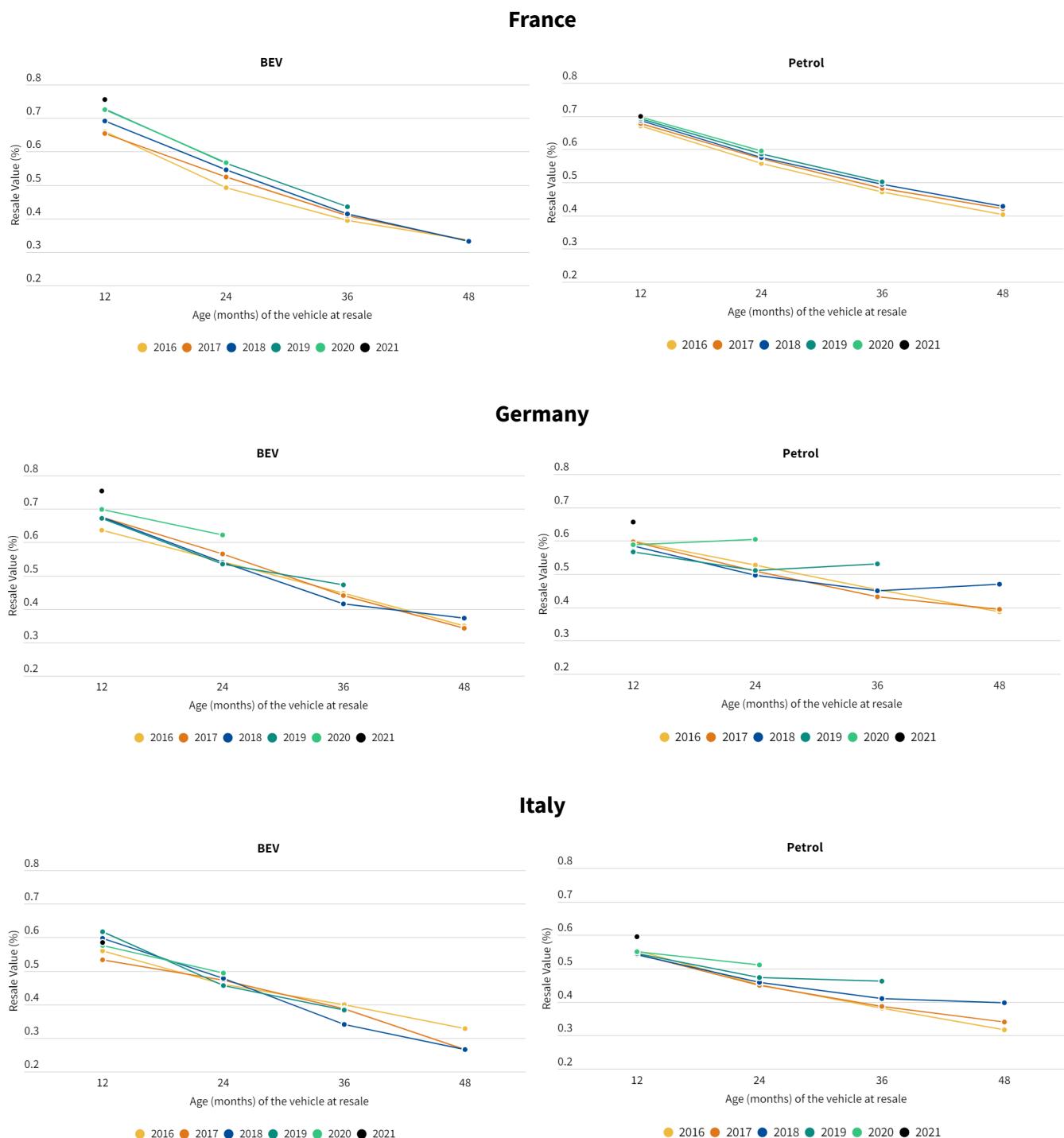


Figure B1: BEV resale value has converged with other powertrains

Source: T&E analysis based on Autovista Residual Value Intelligence tool.

Notes: Cars with an age of 12 months, all mileage options.

Annex C: Resale value percentage by year of first sale, by country



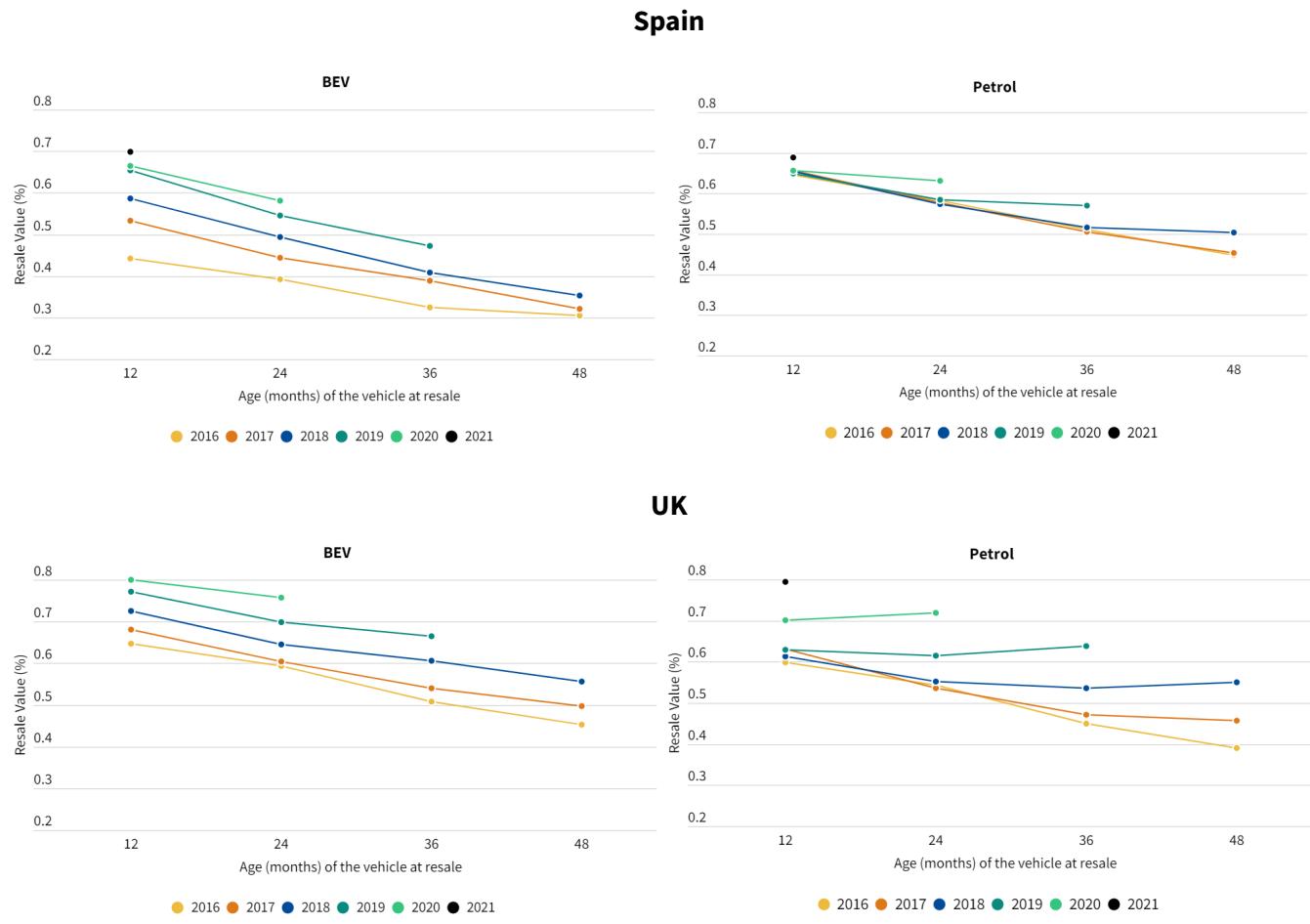


Figure C1: Following the evolution of resale value by year of first sale country by country

Source: T&E analysis based on Autovista Residual Value Intelligence tool.

Notes: Cars with all mileage options

Annex D: Trends in BEV resale value percentage for major brands, by country

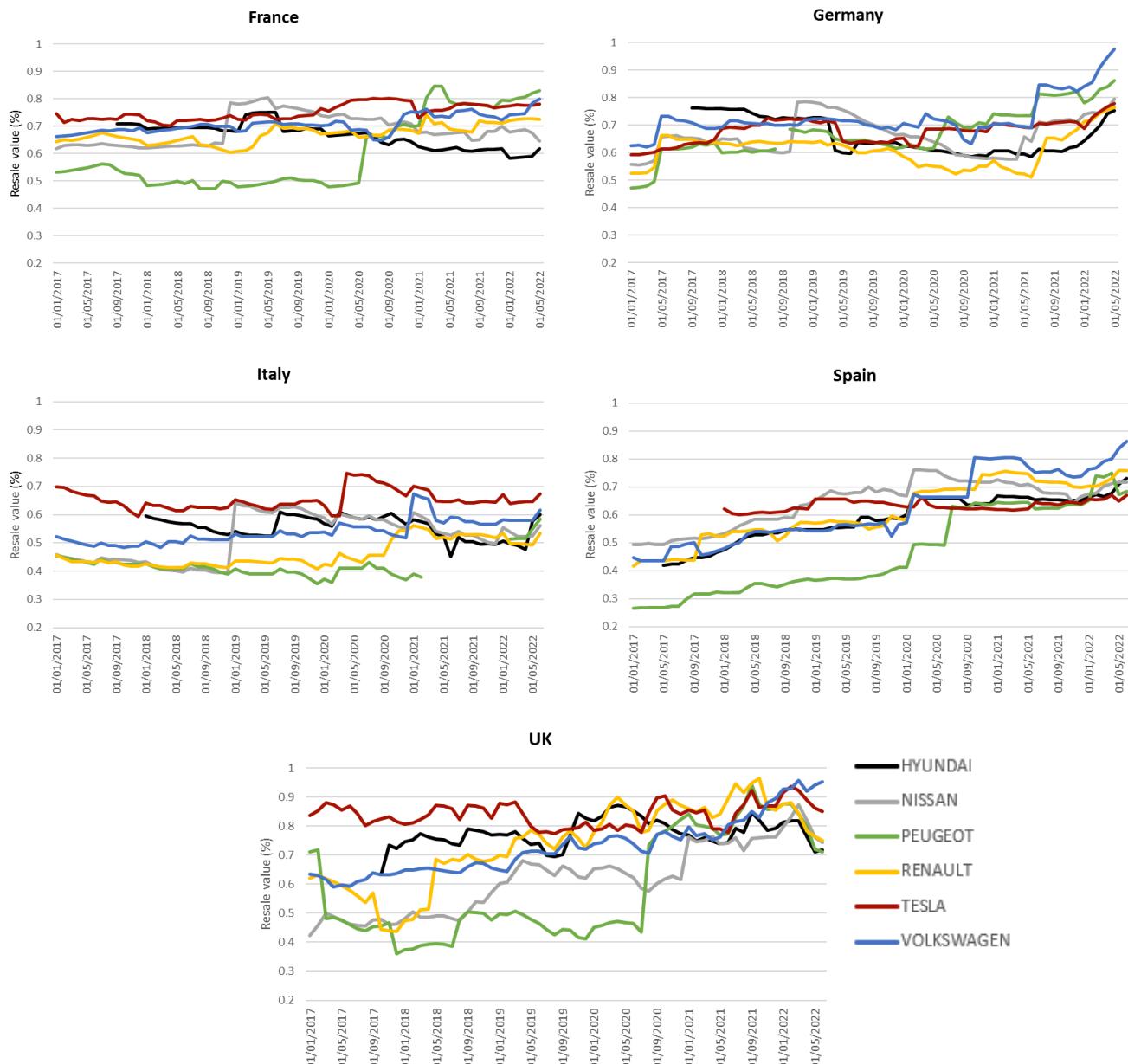


Figure D1: BEV resale value percentage at the brand level can spike when new BEV models are launched

Source: T&E analysis based on Autovista Residual Value Intelligence tool.

Notes: Cars with an age of 12 months, all mileage options.

Annex E: Sensitivity of results to vehicle age

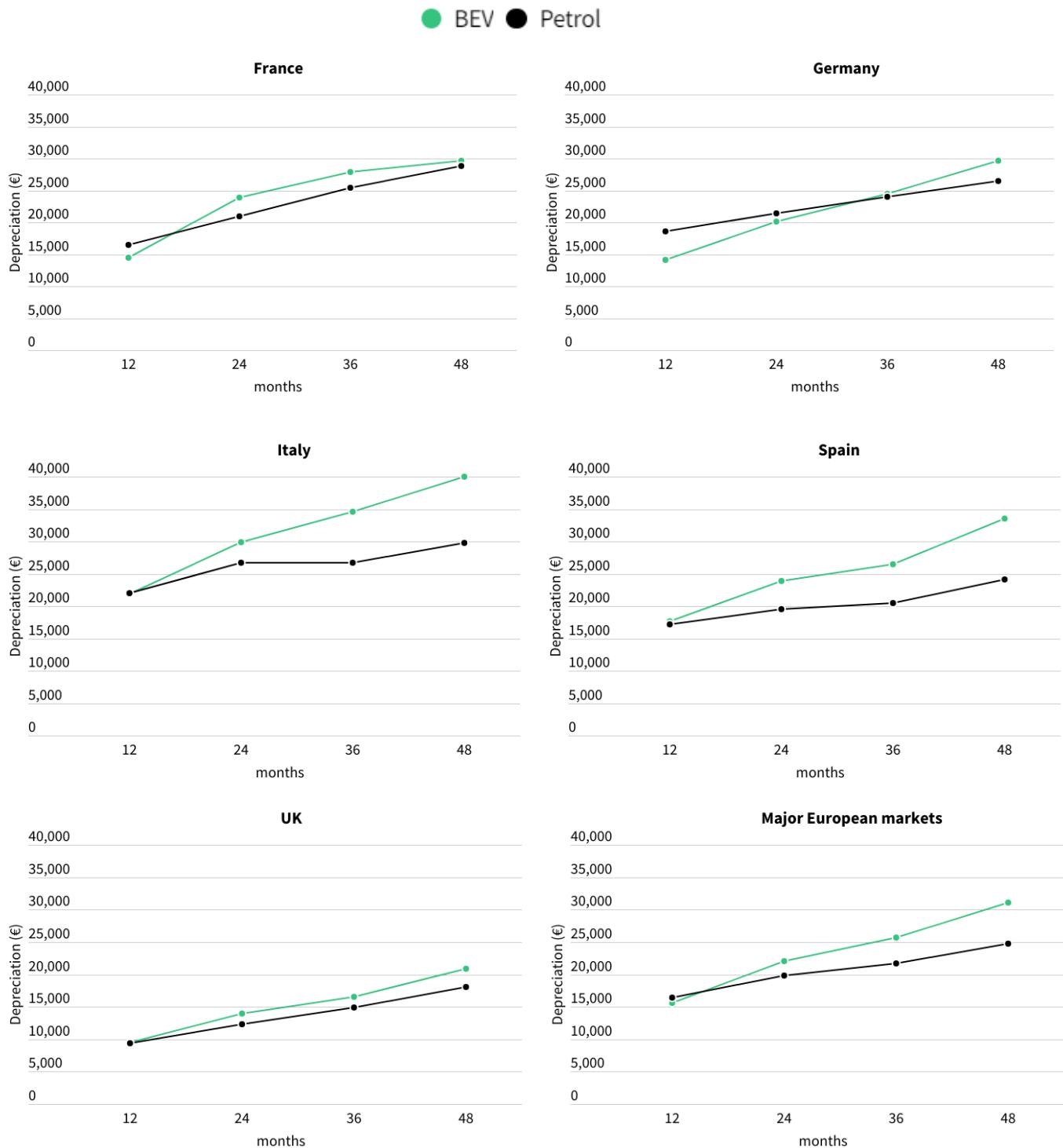


Figure E1: Additional depreciation per year of ownership for BEV and petrol cars

Source: T&E analysis based on Autovista Residual Value Intelligence tool.

Notes: Cars with 20,000km per year. For Italian data points pre-2021 the Autovista RCI resale value by age is the same across cars with different annual mileages. Data range covers January-June 2022.

Annex F: Sensitivity of results to car mileage

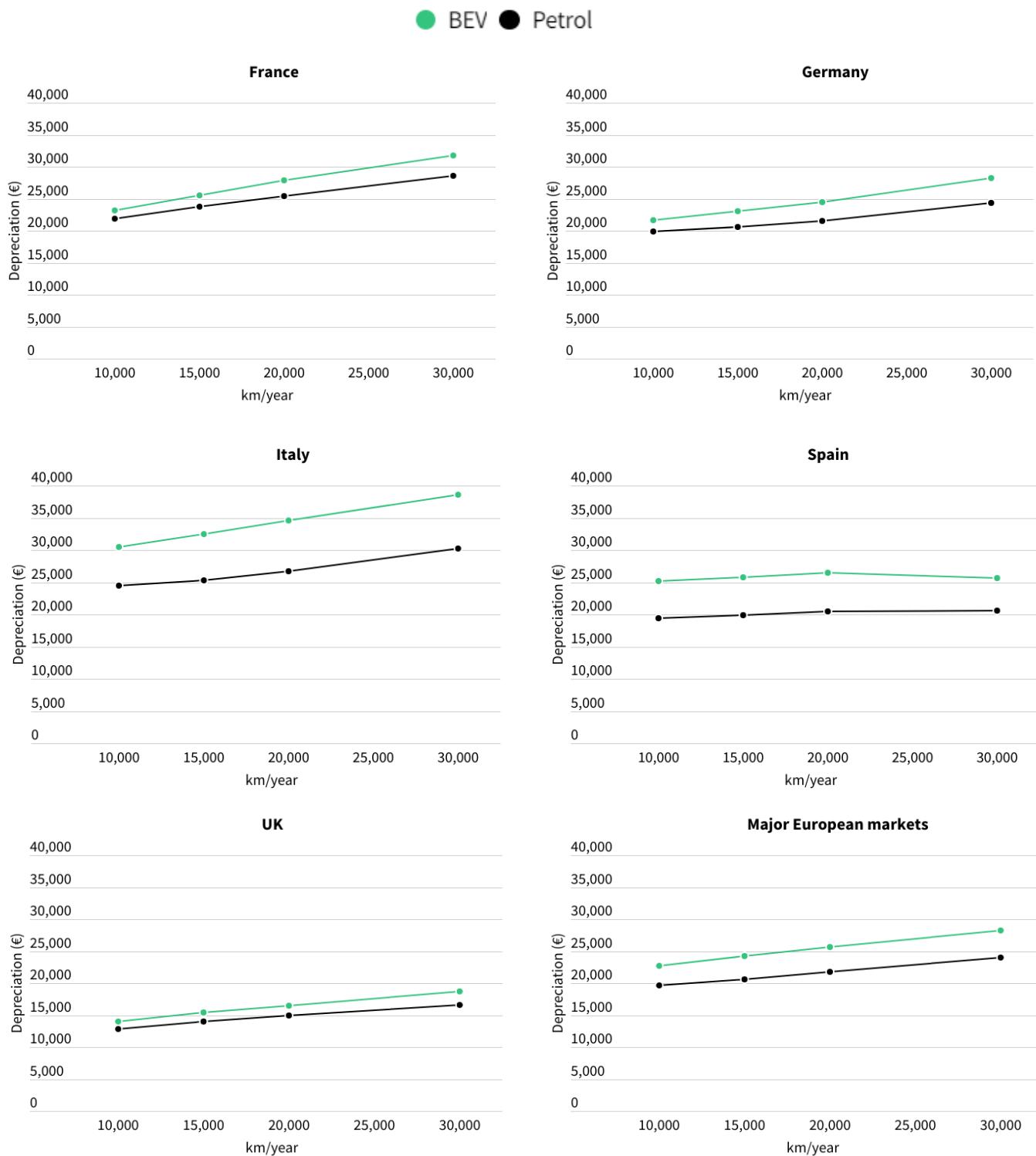


Figure F1: Additional depreciation per 10,000 kilometres of use for BEV and petrol cars

Source: T&E analysis based on Autovista Residual Value Intelligence tool.

Notes: Cars with an age of 36 months. For Italian data points pre-2021 the Autovista RVI resale value by age is the same across cars with different annual mileages. Data range covers January-June 2022.

Annex G: Sensitivity of results to car segment

Table G1: Resale value percentage of BEVs and petrol in 2022 by segment

Segment	12 months		36 months	
	BEV	Petrol	BEV	Petrol
A segment	76%	66%	37%	52%
B segment	71%	70%	46%	55%
C segment	73%	71%	46%	55%
D segment	79%	68%	55%	52%
E segment	72%	68%	54%	51%
F segment	-	63%	-	50%
M segment	-	-	44%	58%
B SUV segment	72%	72%	51%	57%
C SUV segment	74%	72%	58%	57%
D SUV segment	72%	73%	48%	60%
E SUV segment	67%	75%	54%	60%
B MPV	70%	65%	51%	57%
C MPV	59%	67%	-	52%
D MPV	-	67%	-	52%

Source: T&E analysis based on Autovista Residual Value Intelligence tool.

Notes: Cars with all mileage options. Data range covers January-June 2022.

Table G2: Depreciation (€) of BEVs and petrol in 2022 by segment

Segment	12 months		36 months	
	BEV	Petrol	BEV	Petrol
A segment	5,998	5,768	14,381	7,205
B segment	8,669	6,459	15,416	8,525
C segment	9,189	9,400	18,240	13,964
D segment	10,509	17,761	25,820	25,834
E segment	38,584	29,914	49,096	41,830
F segment	-	48,068	-	67,401
M segment	-	-	11,864	6,827
B SUV segment	10,415	7,477	18,863	10,588
C SUV segment	11,558	10,283	16,096	14,247
D SUV segment	18,024	14,595	43,196	21,972
E SUV segment	28,759	28,902	45,175	40,850
B MPV	11,418	7,231	16,442	10,045
C MPV	14,371	11,315	-	14,819
D MPV	-	15,013	-	17,249

Source: T&E analysis based on Autovista Residual Value Intelligence tool.

Notes: Cars with all mileage options. Data range covers January-June 2022.

Annex H: Sensitivity of results to car brand

Table H1: BEV and petrol resale value percentage in H1 2022 from the 25 largest brands in Europe

Brand	12 months		36 months	
	BEV	Petrol	BEV	Petrol
VW	80%	72%	49%	60%
Toyota	54%	69%	30%	55%
BMW	73%	68%	51%	53%
Peugeot	73%	67%	31%	53%
Audi	70%	73%	49%	58%
Mercedes-Benz	75%	72%	50%	56%
Renault	70%	64%	52%	51%
Kia	71%	69%	53%	54%
Skoda	78%	71%	-	56%
Hyundai	65%	68%	47%	52%
Ford	-	69%	-	52%
Dacia	81%	78%	-	64%
Opel	70%	64%	-	49%
Fiat	76%	65%	-	49%
Citroen	72%	67%	33%	54%
Volvo	83%	69%	-	54%
Nissan	69%	68%	45%	51%
Tesla	76%	-	56%	-
Seat	84%	68%	-	55%
Cupra	-	73%	-	60%
Mini	82%	72%	-	58%
Mazda	75%	68%	-	56%
Suzuki	-	70%	-	53%
Jeep	-	69%	-	53%
Porsche	74%	76%	-	64%

Source: T&E analysis based on Autovista Residual Value Intelligence tool. Brand ordering based on Dataforce (2023).

New passenger car registrations 2022.

Notes: Cars with all mileage options. Data range covers January-June 2022.