Consumer Monitor 2023

EUROPEAN ALTERNATIVE FUELS OBSERVATORY

EUROPEAN AGGREGATED REPORT

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1. The 2023 European EAFO consumer monitor: key findings & conclusions

The European Green Deal aims for a 90% reduction of greenhouse gas emissions for transport by 2050. Different policies are in place to achieve this goal, including standards on CO_2 vehicle emissions, public procurement rules, or the recently adopted Alternative Fuels Infrastructure Regulation (AFIR)[1, 2, 3]. Nevertheless, in 2019, the transport sector was responsible for around one-quarter of the EU's total CO_2 emissions, 60.6% of which were emitted by passenger cars. The passenger car is still the main transport mode and has continued to increase its share since the year 2000[4]. Replacing existing fleets with zero-emission vehicles is one of the key measures identified for this purpose. Important efforts have been made to promote electric cars, and therefore, identifying the main hurdles and needs of (potential) battery electric drivers can support the design and implementation of tailored strategies, policies and solutions to stimulate the demand for this type of vehicle.

For more than a decade, three main barriers have been identified regarding the mass up-take of passenger battery electric vehicles (BEVs): purchase price, driving range and availability of recharging infrastructure. There have been significant advances: battery costs have dropped by 90%, vehicle range has increased from 100-150 km up to 400+ km, and the recharging infrastructure network is expanding. Nevertheless, BEVs represent only 1.68% of the total passenger cars fleet in the EU, and the recharging infrastructure coverage is still limited in some countries and urban areas[5,6].

This report highlights the main findings of the 2023 EAFO Consumer Monitor survey and presents the results for Europe (aggregated for the twelve surveyed countries).

Taking these barriers and developments into account, the key findings of the 2023 EAFO consumer monitor are:

37% of the non-BEV European drivers are interested in BEVs, and 29% are (very) familiar with these. 33% of the non-BEV driver participants

[1] https://eur-lex.europa.eu/resource.html?uri=cellar:5e601657-3b06-11eb-b27b-01aa75ed71a1.0001.02/DOC_1&format=PDF
[2] https://eur-lex.europa.eu/eli/dir/2019/1161/oj
[3] https://eur-lex.europa.eu/eli/reg/2023/1804/oj
[4] https://www.europarl.europa.eu/topics/en/article/20190313STO31218/co2-emissions-from-cars-facts-and-figures-infographics
[5] Van Mierlo, J., Berecibar, M., El Baghdadi, M., De Cauwer, C., Messagie, M., Coosemans, T., Jacobs, V. A., & Hegazy, O. (2021). Beyond the State of the Art of Electric Vehicles: A Fact-Based Paper of the Current and Prospective Electric Vehicle Technologies. World Electric Vehicle Journal, 12(1),1-26.
[6] https://alternative-fuels-observatory.ec.europa.eu/

consider buying a BEV in a time frame of 0-5 years. The most important BEVs' advantage is that they are considered better for the climate (no tailpipe CO_2 emissions).

For European drivers, the BEVs' cost is by far the main disadvantage of driving electric cars. The BEVs' price is also the number one challenge in the twelve surveyed countries. The European participants are willing to pay 20,000 € (median value) for a BEV (used or new), whereas for 40% of the European BEV drivers, the purchase price paid was between 20,000 € and 39,999 €. 2% paid less than 10,000 €, 11% paid between 10,000 € and 19,999 €, 46% paid 40,000 € or more, and 1% did not know or did not want to indicate the purchase price.

BEVs' range is also considered a limitation, even though it is not as important as its price. A minimum desired range between 300 km to 500 km was the choice of 34% of all European drivers surveyed. 500 km and more would be the preference of 47%. On the other hand, 6% of the European BEV drivers indicated a factory range until 200 km, 41% between 201 km and 400 km, and 53% of more than 401 km. For 84% of the BEV drivers, the factory range of their vehicle was usually or always enough.

96% of European BEV drivers use their vehicles daily or several times a week. Their BEV is mostly new (74%) and privately owned (69%).

Limited recharging private and public slow options are also considered a disadvantage. To a lesser extent, survey respondents indicated that having too few public fast recharging points can also be a problem.

44% of the European BEV drivers know what vehicle-to-grid (V2G) is and 68% are interested in buying a V2G-capable vehicle.

The EAFO Consumer Monitor 2023 results also provide further insights concerning the three main barriers identified and the measures that could support non-BEV and BEV drivers:

1. European non-BEV drivers are typically characterised as a 35 to 55+-year-old female, living in an apartment, with a middle income (2,000-3,999 €) and secondary education level. On the other hand, a 35 to 55-year-old male, living in a detached house, with a middle income (2,000-3,999 €) and a high education level represents BEV drivers.
2. 57% of the surveyed non-BEV European drivers would consider buying a BEV in the short, medium, or long term. In contrast, 18% do not know if they would buy a BEV and 25% would not buy such a vehicle.
3. When both non-BEV and BEV European drivers were asked about different governmental incentives to support electric driving, a

subsidy to purchase a new BEV was the incentive with the highest perceived impact.

4. For all surveyed European drivers, the most relevant information to have a clear opinion about electric driving is to have information about the cost comparison with fossil fuel cars and batteries and/or driving range, and a test drive.

5. The second-hand and leasing options at an affordable price need to be further considered. 26% of the European BEV drivers bought a second-hand BEV, while 20% indicated that they lease a car (privately or for business purposes), for which 59% pay less than 500 € per month.

6. When comparing factory range to BEV range satisfaction, 80% of the BEV driver respondents whose vehicle has a factory range between 201 and 400 km indicated that this was usually or always enough. This was also the case for 80% of the respondents whose vehicle has a factory range between 301 and 400 km.

7. European BEV drivers responded that the most used location to recharge is a recharging station or wallbox at home (used 55% of the time daily or several times a week). On a daily or weekly basis, public slow and fast recharging points are less often used (18% and 10% respectively).

8. For European BEV drivers, important characteristics of a public recharging session are a fully operational recharging station when arriving, short or no waiting time to access a recharging point, and clear and transparent price information. An integrated cable was considered less important.

9. When surveyed European BEV drivers were asked about the longest waiting time at a public recharging point, 31% never wait when this is occupied (they leave without recharging), while 32% waited for 15 minutes or less. Still, 31% waited between 15 minutes to 1 hour, and 6% waited for 1 hour or more.

10. Most European BEV drivers know which recharging connector or plug is compatible with their car, know how much time it will take to fully recharge their vehicle, and have a clear overview of the recharging points in their vicinity.

11. For European BEV drivers, the main problems encountered when travelling abroad were the range of their BEV and having few recharging stations along the way. On the other hand, 60% found their experience when recharging abroad easy or very easy.

12. The most important criteria to eventually buy a V2G compatible BEV are being able to use the battery of the V2G capable BEV to power their home (e.g., for heating, appliances, etc.) and having a similar purchase price to their current BEV. Solar panels are the most common Renewable Energy Device (RED) among BEV drivers.

The European Alternative Fuels Observatory (EAFO) supports the adoption of alternative fuels in EU transport. It provides key information for the development of relevant strategies and policies, by providing information on the evolution of alternative fuel vehicles and recharging/refuelling infrastructure at the EU level and per country. The EAFO also includes a dedicated section for policymakers and consumers, addressing a wide range of stakeholders including different government levels, vehicle manufacturers, other e-mobility industry companies, automobile organisations, etc.

As part of the EAFO consumer section[7], and for the second year in a row, a survey was launched in October 2023 in twelve EU countries[8,9] to better understand consumers' intentions to adopt battery electric vehicles (BEVs), their e-mobility and recharging behaviour, and the challenges they perceive or encounter in this sense. The EAFO Consumer Monitor focuses on electric road transport, in particular passenger vehicles. It supports policymakers and other key stakeholders by identifying trends, needs and opportunities in the transition towards zero-emission mobility. Detailed information on the survey methodology is available in Annex I.

The EAFO Consumer Monitor survey was performed as follows:

- An online survey was conducted by a closed panel to have a representation of the general population including non-BEV and BEV drivers[10].
- To improve the relevance of the analysis of the BEV drivers alone, an identical online survey was openly disseminated through the EAFO partner AVERE and other external contributors, including FIA members ANWB in the Netherlands and Touring Belgium, the Ministries of Transport from Luxembourg and Lithuania, and the Swedish Energy Agency.

[7] https://alternative-fuels-observatory.ec.europa.eu/consumer-portal

[8] The twelve countries surveyed were: Belgium, Denmark, France, Germany, Hungary, Italy, Lithuania, Luxembourg, Netherlands, Slovenia, Spain, and Sweden.

[9] The results for BEV drivers in Lithuania, Luxembourg and Spain are not representative due to the small sample size (29, 38, and 37 BEV drivers respectively). Nevertheless, these are included to indicate trends in BEV driving, mobility behaviour and the recharging infrastructure.

[10] For this report, non-BEV drivers are identified as those driving a vehicle having an internal combustion engine (diesel, petrol, CNG or LPG, hybrid or plug-in hybrid car). BEV drivers refer to those driving a vehicle with no internal combustion engine and with the battery of the electric motor being recharged by the means.

The total number of valid responses is 19,080 respondents, of which 17,034 were filled out by non-BEV drivers and 2,046 by BEV drivers.

Following Section 1 on key findings and conclusions, Section 2 presents the surveyed European participants' attitude, interest, and the information that could support BEV (potential) drivers. Section 3 focuses only on BEV drivers, providing an insight into the European BEV drivers' e-mobility and recharging behaviour. Section 4 provides an overview of the results using key indicators for the twelve countries surveyed and the EU aggregated results. Finally, section 5 includes a summary of the 2023 situation in the European Union (27 Member States) in terms of passenger BEVs and recharging infrastructure based on the most recent data from EAFO.

2. Consumer monitoring results: general population views on driving full-electric vehicles

This section presents the results of the merged datasets of the surveyed European (EU) non-BEV and BEV drivers: 19,080 valid responses from BEV (2,046) and non-BEV drivers (17,034). It focuses on their attitude, interests and information that could support them to further drive BEV cars.

2.1. Socio-demographics

Based on the survey results, the EU BEV driver is represented by a 35 to 55-year-old man living in a detached house with a middle income and a high education level. The main differences when compared to European non-BEV drivers' representation are the percentage of female drivers, the age group, and the education level.

Table 1 – Socio-demographic results from the survey

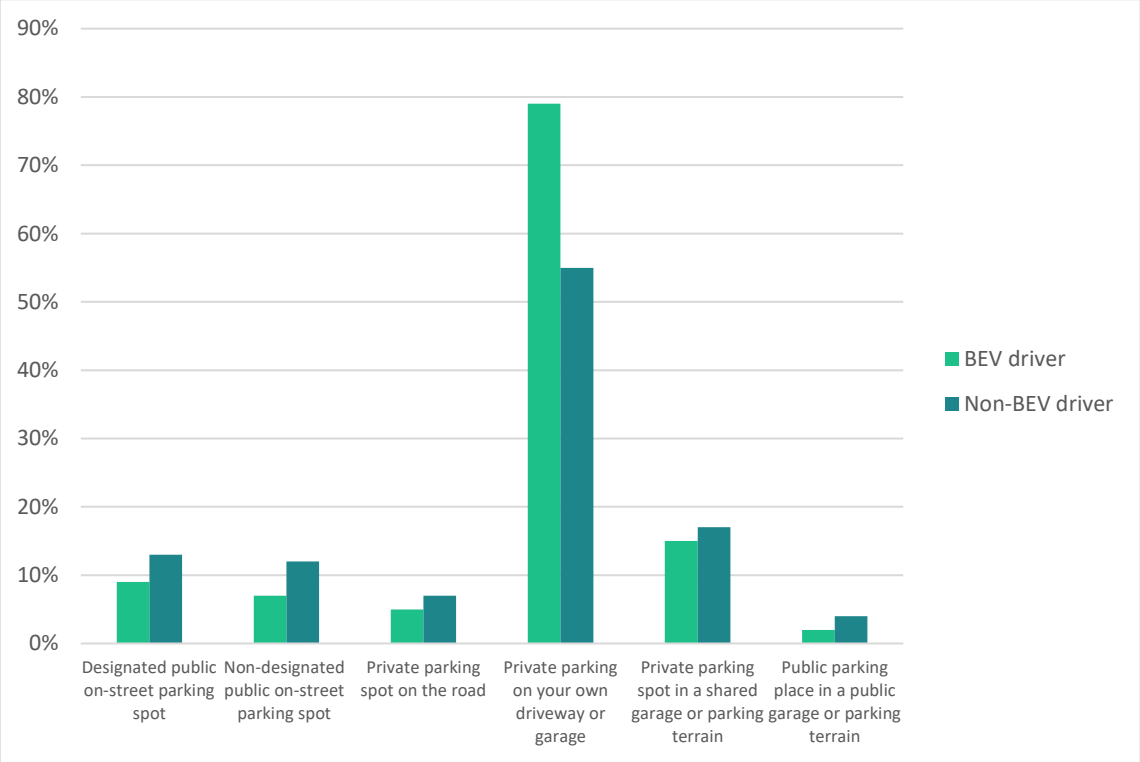
		BEV Driver	Non-BEV driver
Gender	Female	22%	53%
	Male	78%	47%
Age	-35	17%	22%
	35-55	51%	38%
	55+	32%	40%
Income	< 800 €	1%	7%
	800-1,999 €	11%	30%
	2,000-3,999 €	35%	38%
	4,000-5,999 €	31%	18%
	≥ 6,000 €	22%	7%
Education	None	-	-
	Primary education	1%	5%
	Secondary education	38%	57%
	University or other higher education (e.g., college, polytechnic, academy, etc.)	61%	38%
Housing	Apartment/studio	21%	44%
	Attached house	9%	13%
	Semi-detached house	10%	9%

		BEV Driver	Non-BEV driver
	Detached house	59%	33%
	Other	1%	1%

Source: EAFO Consumer Monitor and Survey 2023.

Although most BEV drivers surveyed live in a detached house, 21% live in an apartment or studio. Both EU BEV and non-BEV drivers indicated that they can park at a private parking on their driveway or garage (multiple answers were possible).

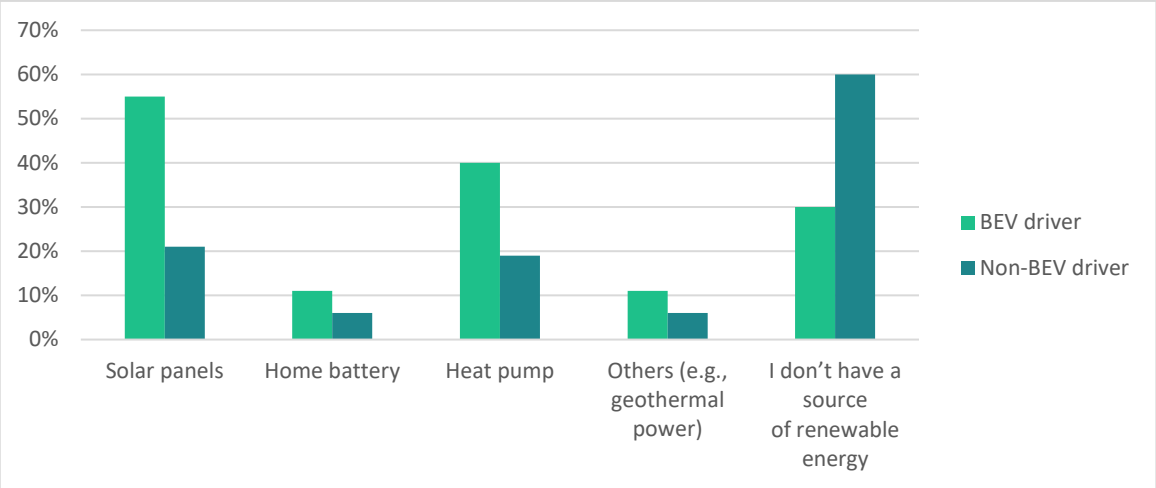
1. Figure: EU (aggregated) drivers identified parking options (multiple answers were possible).



Source: EAFO Consumer Monitor and Survey 2023.

There are also differences between EU surveyed participants when it comes to Renewable Energy Devices (RED), as more BEV drivers indicated having access to a source of renewable energy (multiple answers were possible).

2. Figure: EU (aggregated) drivers' Renewable Energy Devices (RED) possession (multiple answers were possible).



Source: EAFO Consumer Monitor and Survey 2023.

2.2. Attitude and motivation towards battery electric vehicles

29% of the non-BEV driver respondents in Europe specified that they are (very) familiar with battery electric driving and 37% are interested in this. The main BEVs' advantage is that these are considered better for the climate (no tailpipe CO_2 emissions).

2. Table: Opinion and views on battery electric vehicles

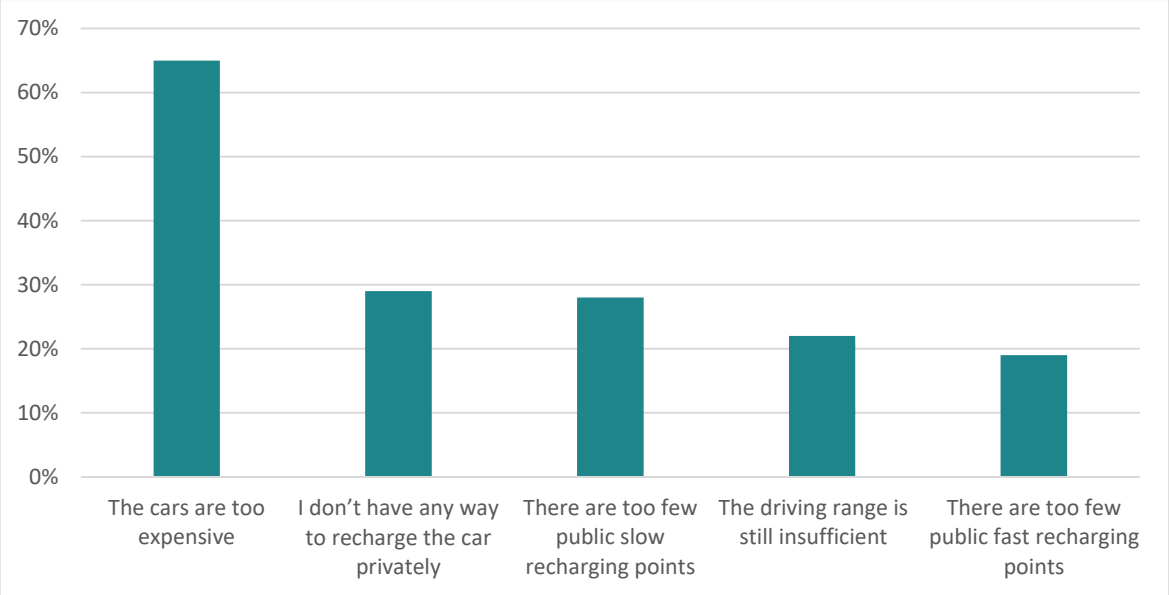
	Results
(Very) familiar with BEV driving (non-BEV drivers)	29%
Interest in BEVs (non-BEV drivers)	37%
Top three advantages BEVs (all surveyed drivers)	Better for climate (no tailpipe CO_2 emissions) Driving characteristics (quiet, comfortable, fast, etc.) Economical to use

Source: EAFO Consumer Monitor and Survey 2023.

2.3. Main barriers and opportunities to adopt battery electric vehicles

EU surveyed participants were asked to choose the five most relevant disadvantages of driving battery-electric vehicles (multiple answers were possible). As previously reported, these include the price of BEVs, limited recharging options (either private or public), and BEVs' range.

3. Figure: EU (aggregated) drivers' top 5 identified disadvantages of battery electric vehicles (multiple answers were possible).

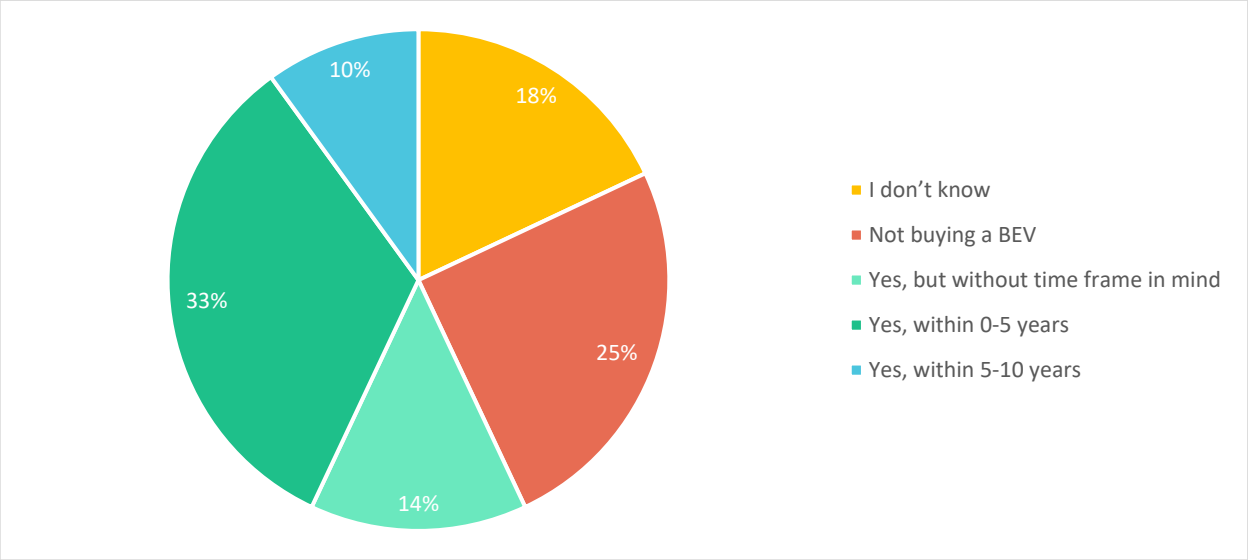


Source: EAFO Consumer Monitor and Survey 2023.

2.4. Time frame to buy a battery electric vehicle

25% of the EU non-BEV driver respondents do not consider buying a battery electric vehicle. 33% expect to do so in a time frame of 0-5 years.

4. Figure: EU (aggregated) non-BEV drivers' time frame to buy a battery electric vehicle.



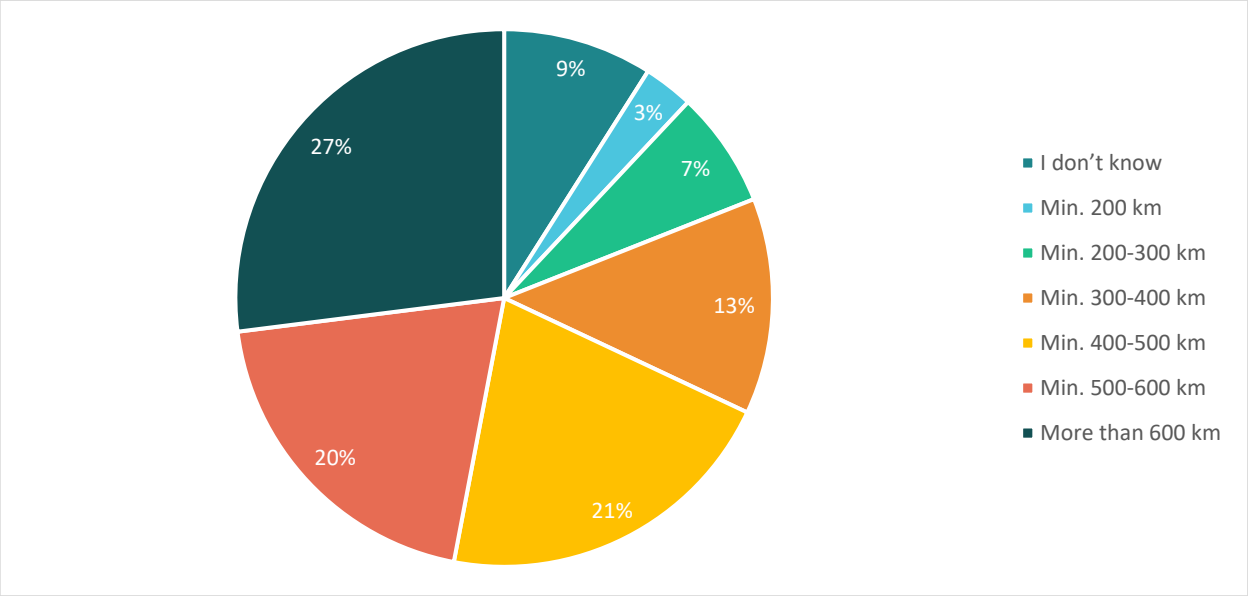
Source: EAFO Consumer Monitor and Survey 2023.

2.5. Willingness to pay and desired range of a battery electric vehicle

The median price that all EU respondents are willing to pay for a new or used Internal Combustion Engine Vehicle (ICEV) is 15,000 € while for a new or used BEV is 20,000 €.

In the EAFO consumer monitor survey, desired range was described as the number of kilometres that can be driven with a full battery without recharging. A minimum desired range between 300 km to 500 km was the choice of 34% of all EU drivers surveyed. 500 km and more would be the preference of 47%.

5. Figure: EU (aggregated) drivers' desired driving range of a battery electric vehicle.



Source: EAFO Consumer Monitor and Survey 2023.

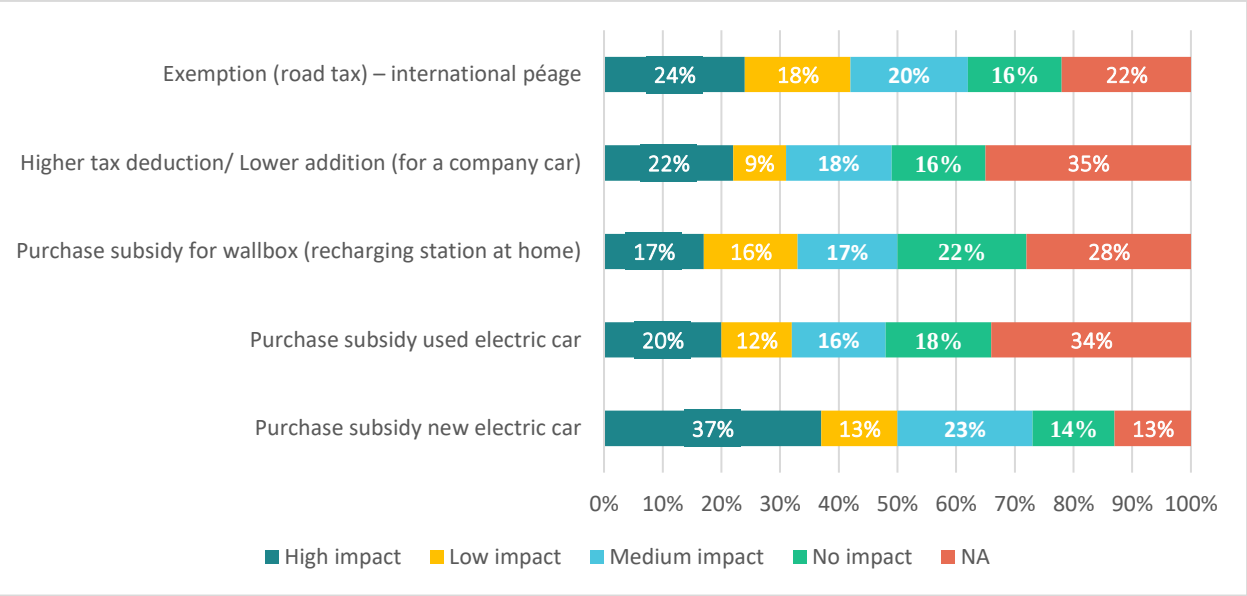
The current BEV market consists of a considerable amount and variety of models (115 individual models, and 286 model variations) with a range between 300 and +600 km (models' variance in March 2024 according to the EAFO). On the other hand, there are only thirteen BEV models available with a purchase price between 20,000 € to 35,000 € (representing 5% of the total BEV models in the market). These have an average range of 217 km (min 135 km, max 300 km), and include mostly cars in the A and B segments (supermini, e.g., city cars), with a couple of models in the C segment (compact, e.g., small family cars).

2.6. Support and governmental incentives to drive a battery electric vehicles

EU drivers were asked about what they would value the most to have a clearer opinion about electric driving. Cost comparison with fossil fuel cars, more information about batteries and/or driving range, and a test drive were the most relevant support measures.

In addition, they also indicated the impact of different governmental incentives on the decision to drive an electric vehicle. A subsidy to purchase a new BEV and road tax exemptions are the incentives with the highest perceived impact.

6. Figure: Perceived impact of governmental incentives on EU (aggregated) drivers' decision to drive a full-battery electric vehicle.



Source: EAFO Consumer Monitor and Survey 2023.

Interestingly, in a separate question, 33% of the surveyed European drivers indicated that they are not aware of any subsidies for electric driving, even if in most of the surveyed countries a subsidy scheme was in place in 2023.

3. Consumer monitoring results: Mobility and recharging behaviour of battery electric drivers

3.1. Mobility behaviour and vehicle ownership

This section focuses on BEV EU drivers (2,046 valid responses). The European (EU) aggregated results of the EAFO 2023 survey give an insight into the mobility behaviour of EU BEV drivers. Results on recharging behaviour are also presented.

96% of the BEV EU drivers surveyed use their vehicle several times a week or daily. Most BEVs (when it is the main household vehicle) are new privately owned cars (although company cars are well represented). Most EU BEV drivers have less than one to 3 years of experience as a BEV driver.

3. Table: Mobility behaviour and vehicle ownership.

	Results
< 1 year to 3 years as BEV driver	68%
3 years to 5 years or longer as BEV driver	32%
km driven per year (median)	17,000
km driven per day (median)	70
BEV drivers using their vehicle daily to several times a week	96%
BEV ownership (BEV as main car)	For shopping/errands (e.g., bringing and picking up the children, doctor visits, administration), and leisure activities.
Leased BEV (business)	4%
Leased BEV (private)	16%
BEV company car (if employee)	11%
Privately owned BEV	69%
New vs. second-hand BEVs (BEV as main car)	
New BEV	74%

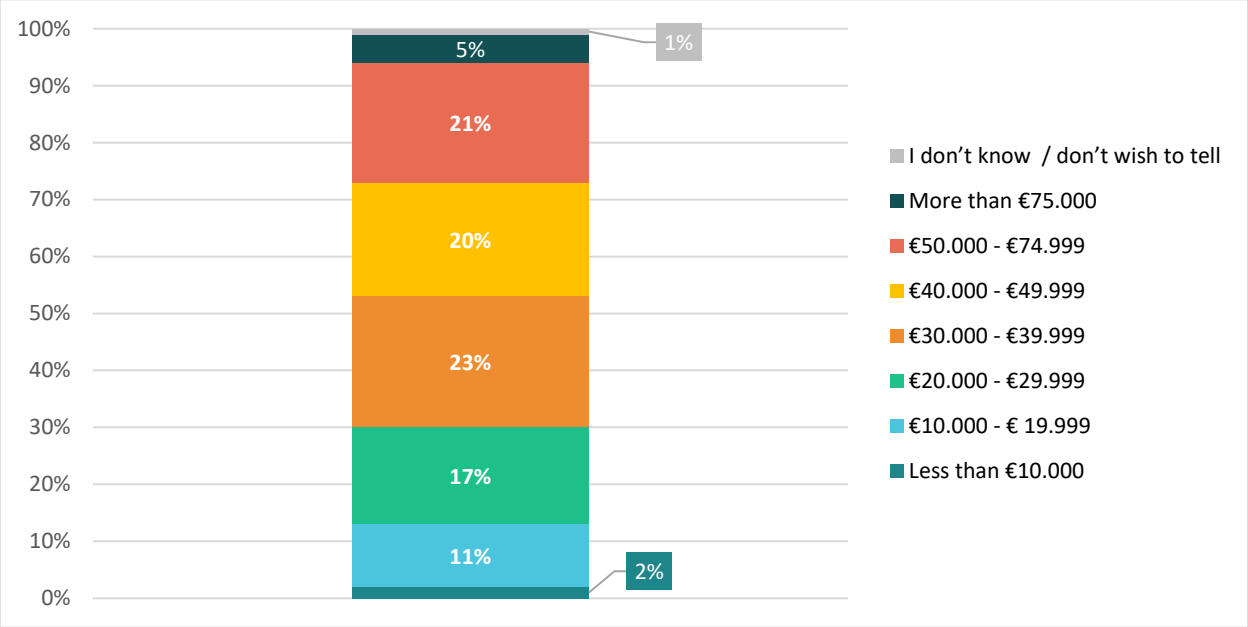
	Results
Second-hand BEV	26%

Source: EAFO Consumer Monitor and Survey 2023.

3.2. Purchase and lease price paid by BEV drivers

Surveyed BEV EU drivers indicated the purchase price paid when their BEV is the main vehicle. For 40% this was between 20,000 € and 39,999 €. 2% paid less than 10,000 €, 11% paid between 10,000 € and 19,999 €, 46% paid 40,000 € or more, and 1% did not know or did not want to indicate the purchase price.

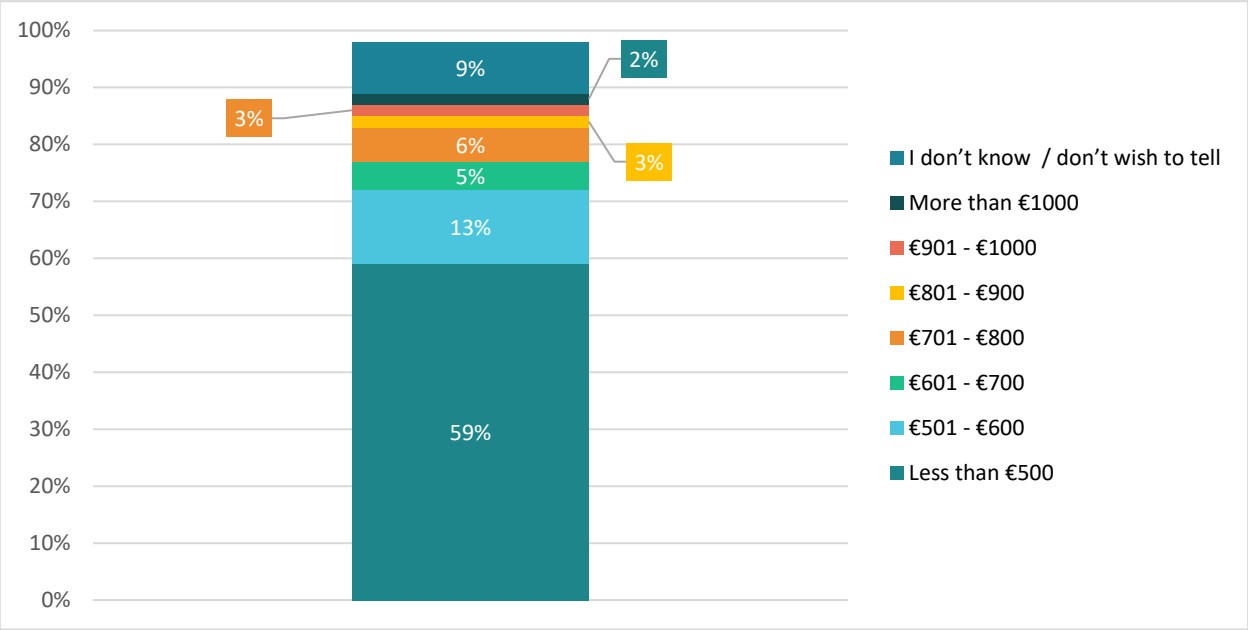
7. Figure: EU (aggregated) BEV drivers' purchase price for their battery electric vehicle.



Source: EAFO Consumer Monitor and Survey 2023.

On the other hand, 20% of the EU BEV driver participants responded that their first car was leased (privately or for business purposes). 59% pay less than 500 € per month, while 31% pay more than 501 €.

8. Figure: EU (aggregated) BEV drivers' lease fee for their battery electric vehicle.

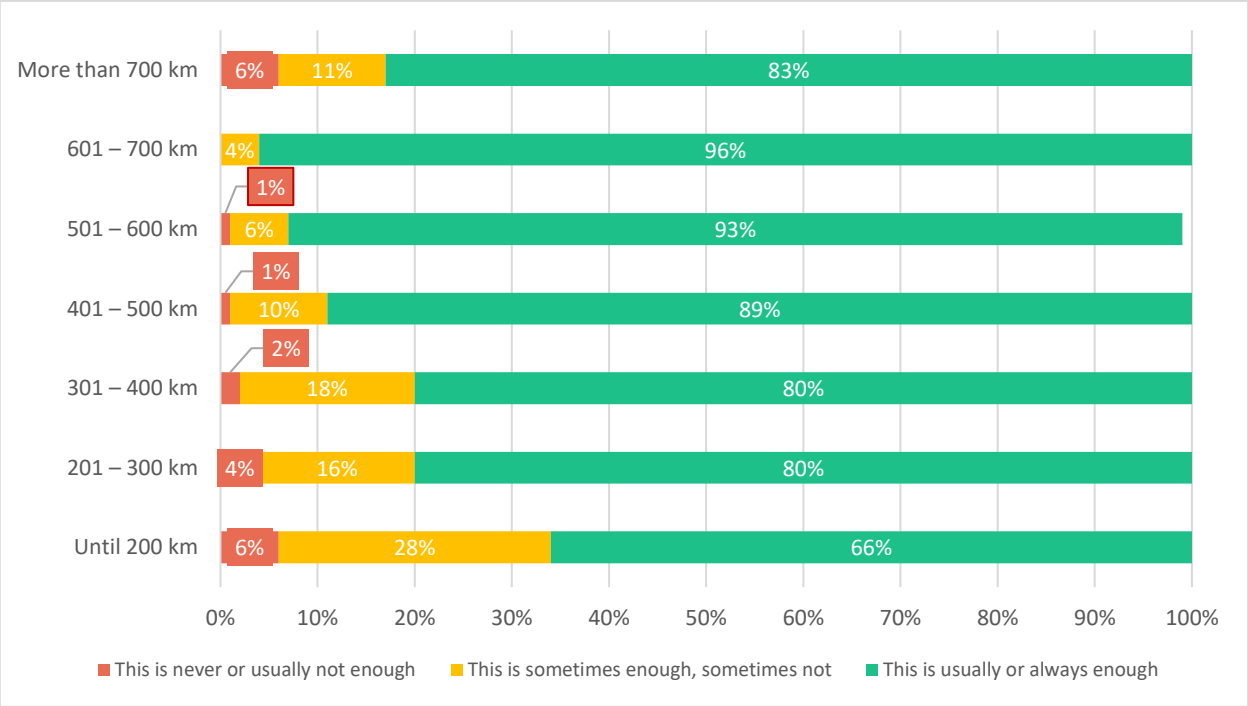


Source: EAFO Consumer Monitor and Survey 2023.

3.3. Factory range and range satisfaction of full-electric cars used by BEV drivers

Factory range refers to the kilometres a new BEV can drive with the available vehicle battery after running a World Harmonised Light Vehicle Test Procedure (WLTP) test cycle. 6% of the European BEV drivers indicated a factory range until 200 km, 41% between 201 km and 400 km, and 53% of more than 401 km The factory range of the first car was usually or always enough for 84% of the surveyed EU BEV drivers. When comparing factory range to BEV range satisfaction, 80% of the BEV driver respondents stated that a factory range between 201 and 300 km was usually or always enough. This was also the case for 80% of the respondents with a factory range between 301 and 400 km.

9. Figure: Factory range and range satisfaction according to EU (aggregated) BEV drivers.

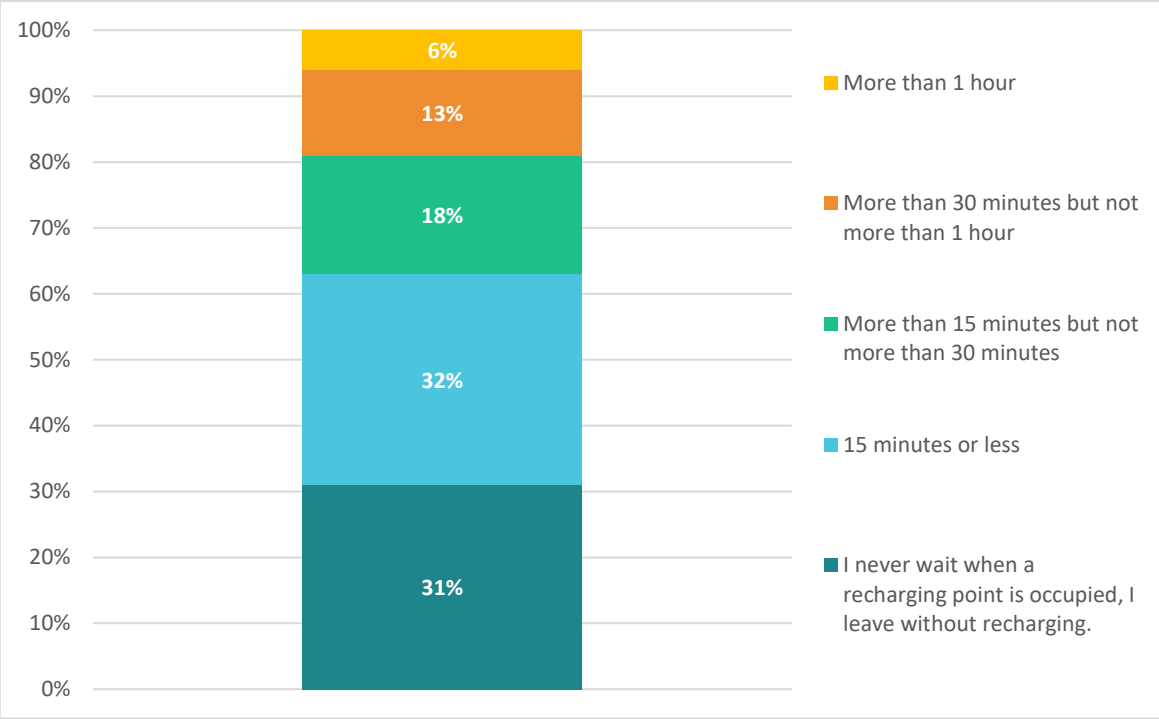


Source: EAFO Consumer Monitor and Survey 2023.

3.4. BEV drivers recharging according to battery level and waiting time at public recharging points

Surveyed BEV EU drivers were asked what the longest waiting time was to use a public recharging point. 31% never wait when this is occupied (they leave without recharging), while 32% waited for 15 minutes or less. Still, 31% waited between 15 minutes to 1 hour, and 6% for more than an hour. Furthermore, 51% responded that they recharge their BEV when the battery level reaches a certain threshold.

10. Figure: EU (aggregated) BEV drivers' waiting times when using a public recharging point.

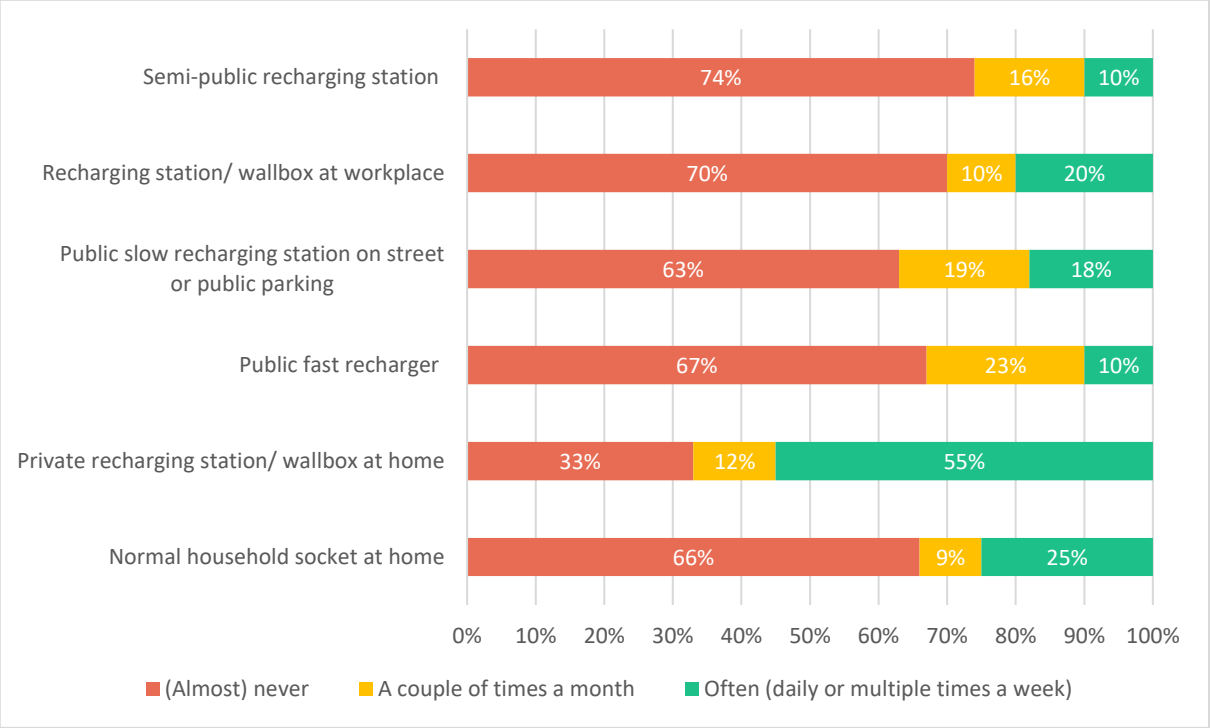


Source: EAFO Consumer Monitor and Survey 2023.

3.5. Recharging location and frequency of use by BEV drivers

For BEV EU drivers a private recharging station or wallbox at home is the most frequently used location. Public slow recharging stations on the street or public parking and public fast recharging stations are not that often used (18% and 10% respectively).

11. Figure: Recharging location and frequency use be EU (aggregated) BEV drivers.

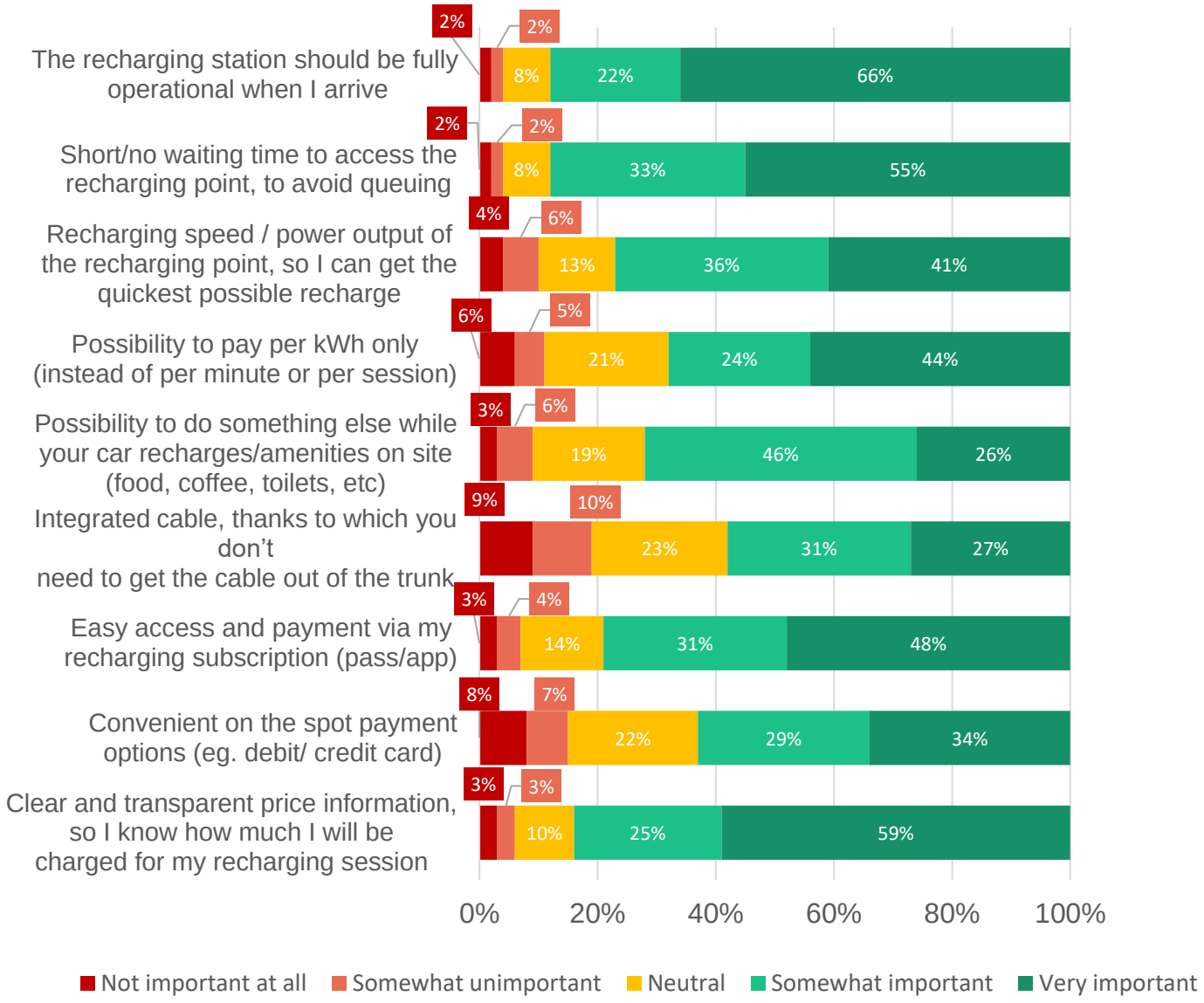


Source: EAFO Consumer Monitor and Survey 2023.

3.6. Important characteristics of a public recharging session for BEV drivers

EU BEV driver respondents were asked to indicate the most important characteristics of a public recharging session. A fully operational recharging station when arriving, short or no waiting time to access a recharging point, and clear and transparent price information were considered the most important ones. An integrated cable was considered less important.

12. Figure: Important characteristics for EU (aggregated) BEV drivers of a public recharging session.

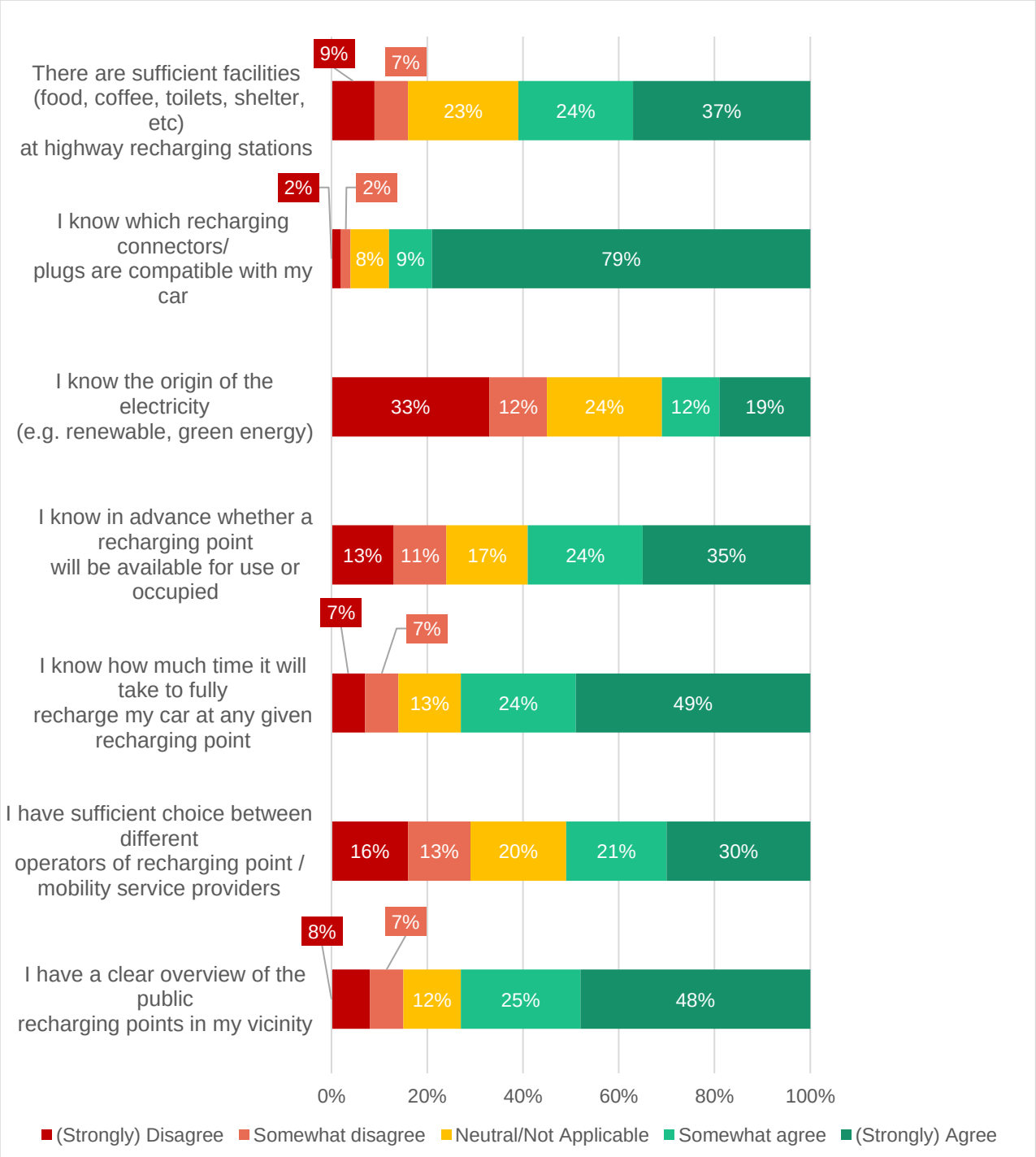


Source: EAFO Consumer Monitor and Survey 2023.

3.7. BEV drivers' opinion and payment options at public recharging points

Most EU BEV drivers know which recharging connector or plug is compatible with their car, know how much time it will take to fully recharge their vehicle, and have a clear overview of the recharging points in their vicinity. On the other hand, they mostly do not know the origin of the electricity at public recharging points.

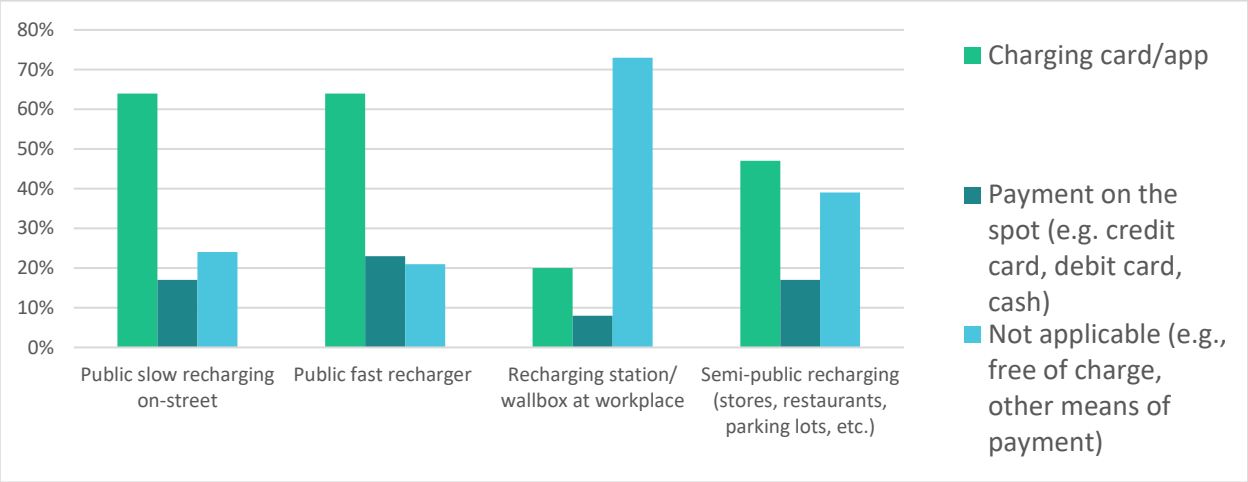
13. Figure: Public recharging points opinions of EU (aggregated) BEV drivers.



Source: EAFO Consumer Monitor and Survey 2023.

In all public and semi-public recharging stations, a charging card or app is the most used payment option.

14. Figure: Payment options used at recharging stations by EU (aggregated) BEV drivers (multiple answers were possible).

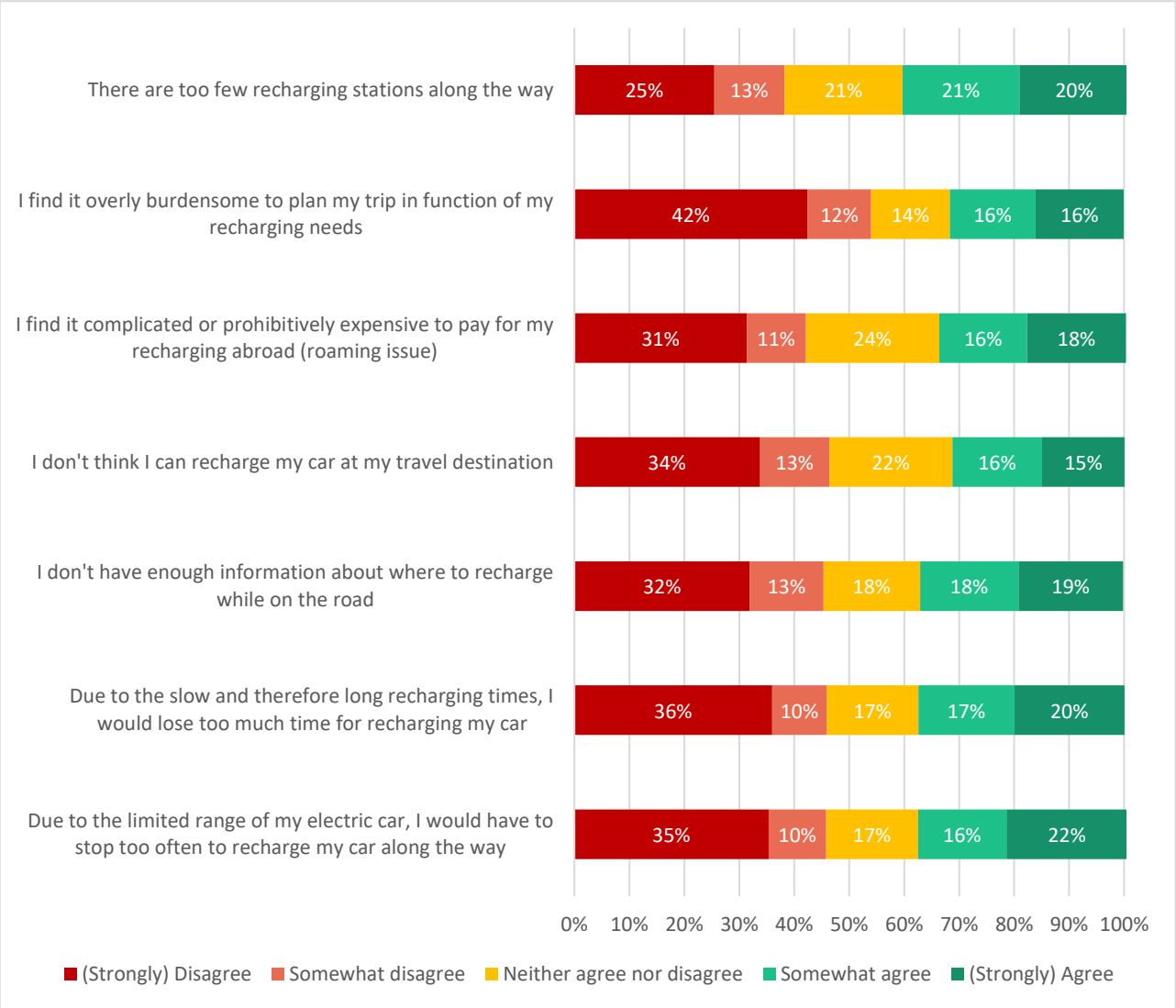


Source: EAFO Consumer Monitor and Survey 2023.

3.8. Main problems encountered by BEV drivers when travelling abroad

40% of the EU BEV drivers responded that they have travelled multiple times abroad with their BEV, 17% have travelled once, and 43% have never used their BEV to travel abroad. When they were asked to indicate the main problems encountered when travelling abroad, the range of their BEV and few recharging stations along the way was the main issue identified.

15. Figure: European(aggregated) BEV drivers' opinions regarding travelling abroad with a BEV.



Source: EAFO Consumer Monitor and Survey 2023.

Nevertheless, when looking at their recharging experience when travelling abroad, 60% specified that it was (very) easy, while 10% considered it as (very) difficult.

4. Table: BEV drivers experience when recharging abroad.

	Results
Very easy	30%
Easy	30%
Not easy, but not difficult either	22%

	Results
Difficult	8%
Very difficult	2%
Not applicable (did not recharge my car abroad)	8%

Source: EAFO Consumer Monitor and Survey 2023.

3.9. Future trends: BEV drivers' awareness and interest in vehicle-to-grid capable vehicles

Vehicle-to-grid (V2G) refers to the interaction between Electric Vehicles and the power grid. The basic idea of V2G is to use EV batteries as intermediate storage facilities for providing services to the electric power system when BEVs are parked. For example, giving energy back to the grid when the car is not in use. EU BEV drivers were asked if they were aware of this technology. 34% had never heard of it, while 34% indicated being aware and having knowledge about this.

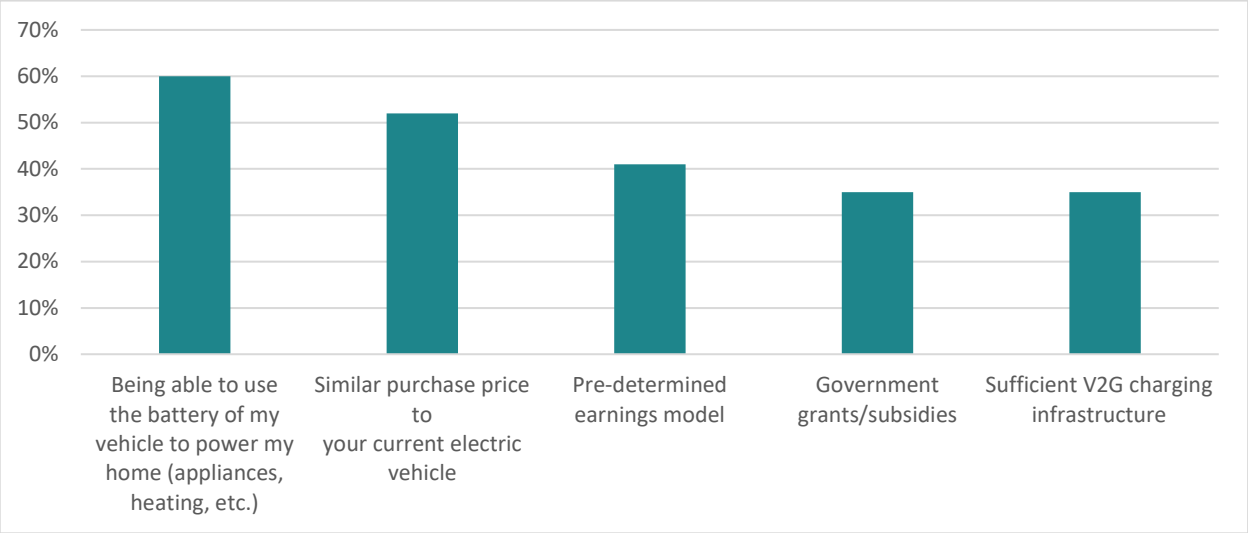
5. Table: BEV drivers V2G awareness

BEV driver V2G awareness	Results
No, never heard of it	34%
Yes, heard of it, but know nothing/just a little bit about it	22%
Yes, heard of it and know quite a bit/a lot about it	44%

Source: EAFO Consumer Monitor and Survey 2023.

Moreover, 68% of the EU BEV drivers stated that they are interested in buying a vehicle with the V2G functionality. The most important criteria to eventually buy such a vehicle are being able to use the battery of the V2G capable BEV to power their home (e.g., for heating, appliances, etc.) and having a similar purchase price to their current BEV car.

16. Figure: EU (aggregated) BEV drivers' willingness to buy a V2G-capable BEV (multiple answers were possible).



Source: EAFO Consumer Monitor and Survey 2023.

4. Surveyed countries and EU aggregated results & incentives overview[11]

The number one BEV driving disadvantage identified in all cases is the purchase price of the vehicle.

57% of European BEV drivers consider buying a BEV in the short, medium or long term. A subsidy to buy a new BEV is the most important government incentive to drive this type of car. Most of the BEVs are new and privately owned. 32% of the European BEV drivers indicated a waiting time of 15 minutes or less. Half of the European BEV drivers consider the level of their vehicle battery before recharging. The reported use of public slow and fast recharging infrastructure is of 18% and 10% respectively.

[11] The results for BEV drivers in Lithuania, Luxembourg and Spain are not representative due to the small sample size (29, 38, and 37 BEV drivers respectively). Nevertheless, these are included to indicate trends in BEV driving, mobility behaviour and the recharging infrastructure.

6. Table: Barriers and opportunities BEV driving

Country	Main disadvantage	% BEV potential drivers (time frame considering buying a BEV)	High impact government incentive to drive BEV	Existing financial incentive (end 2023) 9
Belgium	BEVs are too expensive	44%	Subsidy buying a new EV	Flanders to offer 5,000 € EV grants in 2024 (no subsidies in 2023), reduced annually till 2027. Zero-emission vehicles get tax exemptions, with BEVs 100% company tax deductible till 2026. BIK (benefit-in-kind) rates are CO_2-based, and Brussels offers LEZ replacement subsidies for commercial vehicles and plans to ban diesel by 2030.
Denmark		62%		Denmark offers no direct purchase subsidies for EVs but provides significant tax incentives (more than 10k € in contrast to ICE cars). BEVs enjoy a full exemption from registration taxes, and PHEVs benefit from reduced rates. The country supports public and private EV recharging infrastructure through financial subsidies, tax exemptions, and mandatory installation regulations in new buildings.
France		46%		France offers up to 7,000 € ecological bonus for EVs and 6,000 € for trade-ins, with tax benefits like 50% registration fee exemption for EVs and BIK (benefit-in-kind) reductions for company EVs until December 2024.
Germany		55%		Germany ended its EV subsidies in December 2023, with manufacturer discounts until Mar 2024. Tax benefits for EV company cars continue, and EVs remain exempt from the annual circulation tax until 2025. The focus has shifted to vehicles with proven climate benefits, with a 130 € billion investments in sustainable mobility.
Hungary		67%		Hungary offers a 79 € million subsidies for company BEVs from February 2024 (no subsidy in 2023), with grants up to 10,500 € based on vehicle price and battery capacity. Green plate vehicles enjoy numerous tax exemptions including registration, vehicle, and transfer taxes. Additional benefits include corporate tax credits for energy efficiency, deductible costs for electric charging stations, and free municipal parking for green plate vehicles.
Italy		65%		Current incentives go up to a maximum of 5,000 € with respect to emission class and if you scrap an old polluting car. New incentives (from mid-2024) will go up to a maximum of 13,750 € with respect to income (<30k €) and for BEVs: however, incentives are active, even if lower, for other emission classes, including ICE. Benefits include a five-year tax exemption, reduced VAT for people with disabilities, and incentives for charging installation. Lombardy provides regional subsidies, enhancing support for a cleaner vehicle transition.
Lithuania		*55%*	*Subsidy buying a used EV*	In 2024, Lithuania offers up to 4,000 € for new BEVs, 2,500 € for used EVs, and tax incentives, since the 1st of January 2023, VAT deductions apply on EV purchases up to 50,000 €.

Country	Main disadvantage	% BEV potential drivers (time frame considering buying a BEV)	High impact government incentive to drive BEV	Existing financial incentive (end 2023) 9
Luxembourg		*51%*	*Subsidy buying a new EV*	Purchase subsidy of 8,000 € for new BEVs and FCEVs (Fuel Cell Electric Vehicle) with less than 7 seats and under 18 kWh/100 km consumption; 3,000 € if above this threshold. Up to 1,000 € for electric motorcycles and quadricycles, covering up to 50% of the cost, extended until March 2024. The government halved administrative tax for BEVs, and applied CO_2-based tax incentives, aiming for 49% new EVs by 2030.
Netherlands		52%	Road tax exemptions	Dutch EV incentives include purchase subsidies (2,950 € new, 2,000 € used), and tax emptions until 2024 on BPM (Belasting van personenauto's en motorrijwielen or tax on private motor vehicle and motorcycle charged once for each car registered) and MRB (Motorrijtuigenbelasting, a vehicle tax based on fuel, emissions and weight, paid monthly or quarterly from the date of car registration on the name of the owner). Entrepreneurs enjoy additional tax benefits, although the MIA/Vamil scheme is being phased out. Energy tax for recharging stations is reduced, indirectly lowering costs.
Slovenia		43%	Subsidy buying a new EV	Slovenia offers up to 6,500 € subsidy for new EVs under 35,000 € retail price, for individuals, and various subsidies for legal entities on new EVs up to 65,000 € retail price. Zero benefit-in-kind for company cars, VAT deductions on EV purchases up to 80,000 €, and subsidized Eco Fund loans promote EV adoption.
Spain		*70%*		Spain's MOVES programs offer significant EV subsidies, with up to 7,000 € for new BEVs under conditions like vehicle scrappage. MOVES III extends till July 2024 with a 400-800 € million budgets. Incentives include major tax reductions, VAT exemptions, and enhanced recharging point installation aids, promoting broader EV adoption across the nation. These benefits are complemented by local exemptions from road taxes and special privileges like toll and parking exemptions for electric vehicles.
Sweden		62%		No purchase subsidies for personal EVs post-November 2022, but a new 'climate premium' for light electric trucks from February 2024 (30% of cost difference, capped at 4,300 €. Ongoing support includes minimal road tax (SEK 360 or 31 €), tax benefits for electric company cars, and funding for electric vehicle supply equipment projects.
EU 12 countries		57%		Financial support through grants and loans.

7. Table: BEV cars' ownership model & new/second-hand market

Ownership model & new/used BEV	Belgium	Denmark	France	Germany	Hungary	Italy	Luxembourg	Lithuania	Netherlands	Slovenia	Spain	Sweden	EU-12 countries
Leased BEV (business)	7%	0%	2%	5%	13%	4%	*0%*	*0%*	4%	1%	*0%*	6%	4%
Leased BEV (private)	5%	4%	31%	22%	6%	10%	*16%*	*7%*	14%	15%	*14%*	25%	16%
BEV company car (if employee)	39%	1%	5%	12%	11%	2%	*6%*	*7%*	16%	13%	*3%*	16%	11%
Privately owned BEV	49%	95%	62%	61%	70%	84%	*78%*	*86%*	66%	71%	*83%*	53%	69%
New BEV	79%	73%	77%	86%	51%	89%	*84%*	*26%*	76%	75%	*92%*	67%	74%
Second-hand BEV	21%	27%	23%	14%	49%	11%	*16%*	*74%*	24%	25%	*8%*	33%	26%

8. Table: Recharging behaviour of BEV drivers

Country	Waiting time 15 min or less	BEV drivers recharging considering battery level	% time using slow public recharging point daily/per week	% time using fast public recharging point daily/per week	Most important characteristic public recharging session	Most used payment option at slow recharging points	Most used payment option fast public recharging points
Belgium	31%	46%	23%	16%	Short or no waiting time to access a recharging point	Charging card or app	Charging card or app
Denmark	26%	47%	42%	32%	Fully operational recharging station at arrival		Payment on the spot
France	42%	44%	15%	8%	Clear and transparent price information		Charging card or app
Germany	26%	64%	12%	7%	Fully operational recharging station at arrival		
Hungary	28%	67%	9%	6%	Fully operational recharging station at arrival		
Italy	15%	51%	33%	18%	Fully operational recharging station at arrival		
Lithuania	*10%*	*45%*	*17%*	*10%*	*Fully operational recharging station at arrival*		
Luxembourg	*24%*	*42%*	*11%*	*8%*	*Fully operational recharging station at arrival*		

Country	Waiting time 15 min or less	BEV drivers recharging considering battery level	% time using slow public recharging point daily/per week	% time using fast public recharging point daily/per week	Most important characteristic public recharging session	Most used payment option at slow recharging points	Most used payment option fast public recharging points
Netherlands	38%	54%	20%	8%	Short or no waiting time to access a recharging point		
Slovenia	31%	52%	11%	5%	Fully operational recharging station at arrival		
Spain	*16%*	*70%*	*57%*	*46%*	*Short or no waiting time to access a recharging point*		
Sweden	40%	38%	15%	9%	Fully operational recharging station at arrival		
EU 12 countries	32%	51%	18%	10%	Fully operational recharging station at arrival		

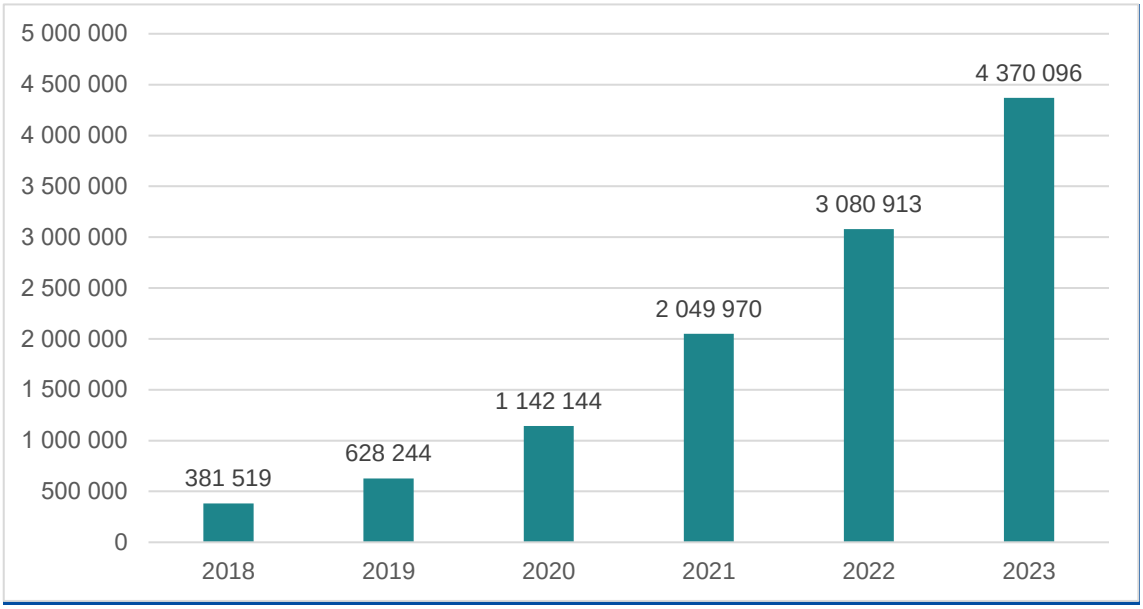
5. BEVs and recharging infrastructure in Europe

EU Member States have implemented different incentives, including tax benefits, VAT exemptions and subsidies to support the uptake of electric vehicles and recharging infrastructure (an overview of these can be found in EAFO incentives & legislation European Union).

Across the European Union, member states have adopted a range of incentives to encourage the adoption of electric vehicles (EVs) as part of a broader commitment to reduce carbon emissions and promote sustainable transportation. These measures include financial subsidies, tax reductions, and support for infrastructure development, tailored to reflect each country's economic and environmental priorities. For instance, Germany transitioned from government subsidies to manufacturer-led incentives after the end of 2023, while Spain's MOVES III plan, extending into 2024, offers up to 7,000 € for new BEVs with conditions such as scrapping older vehicles. France and Italy provide targeted subsidies that vary based on the buyer's income, emphasising accessibility and environmental impact. In contrast, Denmark leverages tax exemptions rather than direct purchase subsidies to promote EVs, including significant exemptions on registration and ownership taxes with a planned gradual phase-out by 2035. Additionally, countries like Hungary and Belgium focus on corporate fleet upgrades and tax benefits for company cars to accelerate EV adoption. Infrastructure support is also a key component, with nations like Sweden and Portugal investing in both private and public charging facilities to support the growing number of EVs.

Additionally, the EU has launched a call for proposals under the Connecting Europe Facility (CEF) for Transport Programme's Alternative Fuels Infrastructure Facility (AFIF), making 1 € billion available to support the deployment of alternative fuels infrastructure along the Trans-European Network of Transport (TEN-T). This second phase (2024-2025) aligns with new regulations for publicly accessible electric recharging and hydrogen refuelling stations in key transport corridors and hubs, as well as ReFuelEU aviation and FuelEU maritime regulations. Eligible projects include infrastructure for road, maritime, inland waterway, and air transport, including Megawatt recharging stations for heavy-duty vehicles, and electricity and hydrogen supply at airports and ports. Proposals must be submitted electronically via the Funding & Tenders Portal by specific deadlines in 2024 and 2025. Evaluations will be conducted by the European Commission and CINEA, with decisions made within 4 months and agreements signed within 9 months. Since 2014, CEF has supported over 1,450 projects with 36.3 € billion.

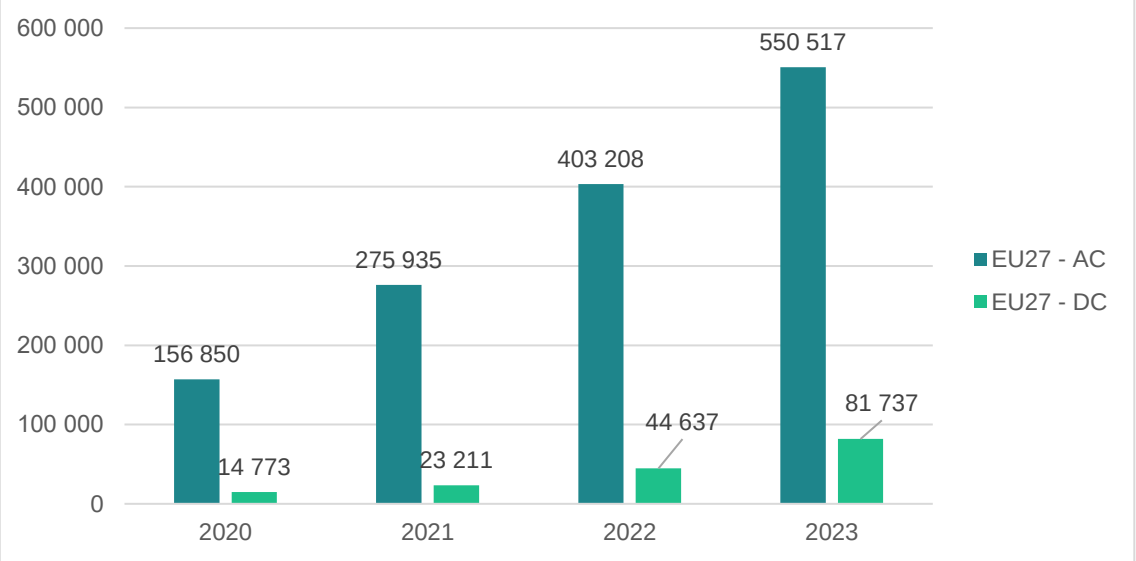
17. Figure: Evolution of the total BEV passenger vehicles in the European Union



Source: EAFO portal.

For the year 2023, there were 4,370,096 BEVs, representing 1.68% of the total passenger vehicles fleet in Europe.

18. Figure: Evolution of alternating and direct current (AC or slow and DC or fast) recharging points in the European Union



Source: EAFO portal.

Moreover, the public recharging infrastructure network has considerably grown in the last few years. According to the EAFO portal, by the end of 2023, there were 550,517 (AC) slow public recharging points, and 81,737 (DC) fast public ones.

6. Annex I: Consumer monitoring methodology & approach

For the 2023 launch of the EAFO consumer monitor survey, twelve countries[12] were selected. The survey was conducted using a panel on the general population of each of the surveyed countries. To improve the analysis of BEV drivers, a purposeful sample was collected through AVERE and external contributors, including FIA members ANWB in the Netherlands, Touring Belgium, the Ministries of Transport from Luxembourg and Lithuania, and the Swedish Energy Agency. The same survey was used for both the panel and the BEV sample.

The survey campaign was launched at the end of October 2023. The aim was to reach 17,750 panel responses. The survey was open for one month. As BEV drivers are difficult to reach, their survey campaign was closed at the beginning of February 2024 in all surveyed countries.

The datasets were subjected to validation tests, including:

- Respondents should have completed the survey by the end and should have agreed to the terms and conditions of the survey.
- Respondents who specified not owning a driver's license were excluded.
- Respondents who filled out the survey in one-third (or less) of the time median for all respondents were excluded from the survey, as it was deemed impossible to fill out the survey thoroughly and in its entirety in such a short time.
- Respondents who indicated unusually high values to open questions with continuous variables (kilometres driven in a day, kilometres driven in a year, purchase price of a BEV and purchase price of an Internal Combustion Engine Vehicle) were excluded from the results.
- Respondents who came up with nonsensical patterns of answers to open questions were excluded.

The validation of all the datasets was finalised in mid-February 2024. To improve the relevance of the analysis of the BEV drivers alone, the survey conducted on BEV drivers (from AVERE and other external contributors) was combined with the survey conducted on the general population. The respondents were considered BEV drivers when their first, second or third car was a BEV. A total of 19,080 responses were considered valid for both the panel and the AVERE and external contributors' datasets. Out of these, there were 17,034 non-BEV and 2,046 BEV drivers.

The validated and combined datasets of all surveyed countries were used for a EU aggregated report.

[12] The twelve countries surveyed were: Belgium, Denmark, France, Germany, Hungary, Italy, Lithuania, Luxembourg, Netherlands, Slovenia, Spain, and Sweden.

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