zoniq

State of the public EV charging in Europe 2024

Foreword

At Zoniq we are looking at EV charging trends every single day - whether on a market level or on the granularity of a single location - to understand the utilisation and its key drivers. We talk to charge point operators (CPOs) across the world on a daily basis. We are diving into articles, research, and data. We're digging through reports done by reputable consultancies. Yet we still missed a comprehensive report that would look at the EV charging market in Europe - both the high-level trends and the country-specific developments in more detail.

So we set out to create one. We used all of the data we had. Talked to industry experts and leading CPOs. Asked our partners and friends. After months of preparation created the first State of the public EV charging infrastructure report for Europe. It combines our expertise with data we gather, licence, and produce to provide a thorough look at the current major trends and future forecasts.

It is not perfect. We know it can be better. We are planning to issue an update after we gather feedback from you, the readers. If you have any inputs or you're missing something, please let us know at report@zoniq.io. And we promise that in 2025 the Report will be even bigger, better, and more comprehensive.

Thank you for your support and happy reading!
Pavol Magic, CEO @ Zoniq

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Executive Summary

The EV charging market in Europe has been very exciting in 2024 so far. Personal EV sales have been booming in some markets. According to ACEA, more than 90 % of all new registrations in July 2024 in Norway were BEVs. The EU average for BEVs was in the same month at 12.1 %. Even though it was about a percentage point lower than the previous year, ICEs fell from 50 % to 46 % between July 2023 and 2024.

EV charging infrastructure keeps on growing at a very fast pace. However, the growth is still mostly driven by investments, and a lot of locations are utilised below national averages. There are also very big regional differences—not only across Europe but also within individual markets. Aside from a few exceptions, such as Norway or the Netherlands, EV penetration is still concentrated in the wealthiest regions. The EV charging infrastructure naturally follows this pattern. What is good to see is that charging hubs are becoming more popular, providing reliable charging to a wide range of customers. Charging deserts are also disappearing, fighting one of the biggest enemies of e-mobility—range anxiety.

Output powers of charge points keep on increasing. In DC charging, the 50 kW connectors still remain the golden standard, but speeds above 150 kW are becoming more popular, especially at the higher end. With the adoption of EVs capable of charging at these speeds, they are fighting the second enemy of EV adoption—long charging times. We also see the emergence of megawatt charge points capable of charging electric heavy-duty vehicles, which are becoming more common. However, the adoption of e-trucks is still very low and is only starting to pick up pace.

The price of EVs is the third blocker in wider adoption, which we looked at in our report, specifically from a total cost of ownership perspective. In markets where electricity is very cheap compared to gas, we could expect much higher adoption rates of EVs, which isn't always the case. Although the cost of EVs themselves can be a blocker, drivers in markets like Greece, Croatia, and Portugal could save thousands of euros every year, but EV adoption is still relatively low.

The occupancy rates vary wildly as well. In general, we can observe the highest rates in isolated locations with charge points above 150 kW, with some locations on motorways reaching occupancy above 30 %, while national averages are in single-digit numbers even for markets such as the Netherlands. Different occupancy rates can also be observed in time. Southern European markets naturally benefit from summer vacations, while in others the occupancy is the highest around major holidays, such as Easter and Christmas.

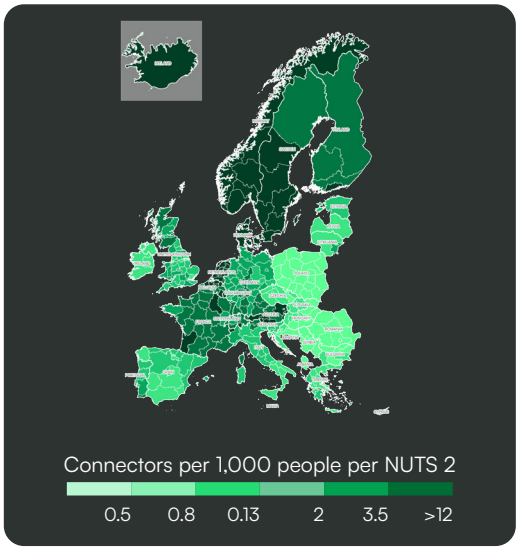
And what about the EU and national EV and infrastructure targets? Well, as it seems, they are very optimistic in some cases. But based on our forecasts and expectations of industry experts, they should be achievable.

Major Trends

Big regional differences in Europe, but also within markets.

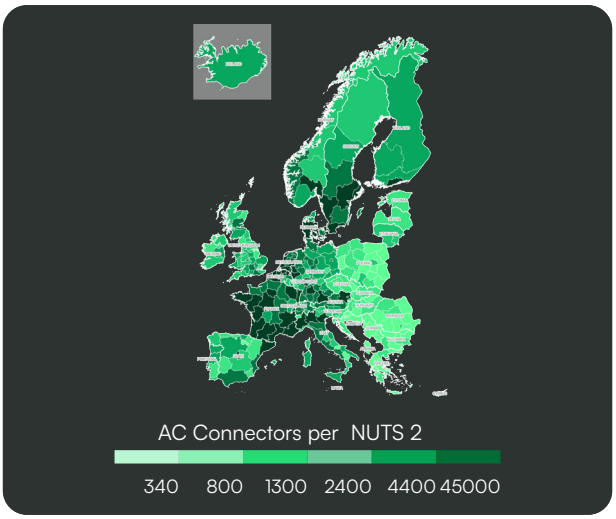
There are a number of ways to look at the distribution of EV charging infrastructure. When looking at penetration rates compared to population, we can identify very strong outliers in some regions in Norway, Iceland, Sweden, the Netherlands, Belgium, and Denmark. Some of them have more than 10 connectors (AC and DC combined) per 1,000 people—5 times higher than the European average of 2 connectors per 1,000 people and almost 8 times higher than the median value of 1.3. This is not very surprising given their EV penetration rates and overall development of the EV market. However, Valle d'Aosta and Ticino in Italy and Salzburg and Tirol regions in Austria are noteworthy as well, given their penetration of 4 to 5 connectors per 1,000 people. Looking at the seasonality and utilisation patterns in general combined with the geography of these regions, it is clear that the utilisation here is mostly driven by EV drivers on vacations.

Looking at the total number of all AC and DC connectors, we can see a slightly different picture. Although some regions in Norway, Sweden, and the Netherlands are the clear leaders, there are other regions worth noting as well. These are mostly in France (Pays de la Loire, Aquitaine, Midi-Pyrénées, and Nord-Pas de Calais having around 7 to 8 thousand connectors each and Provence-Alpes-Côte d'Azur, Rhône-Alpes, and Ile-de-France having 13, 15, and 25 thousand connectors, respectively). Aside from the Nordic markets, similar numbers can only be observed in Stuttgart and Oberbayern regions in Germany, Lombardia in Italy, and Cataluña in Spain. The European average amount of connectors per region is 3,457, with a median value of 1,916.

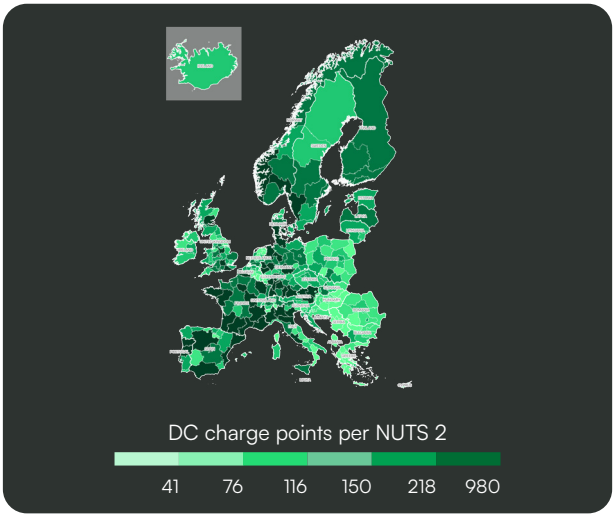


Norway, Iceland, Sweden, the Netherlands, Belgium, and Denmark. ***More than 10 connectors*** (AC, DC, and HPC combined) **per 1,000 people**.

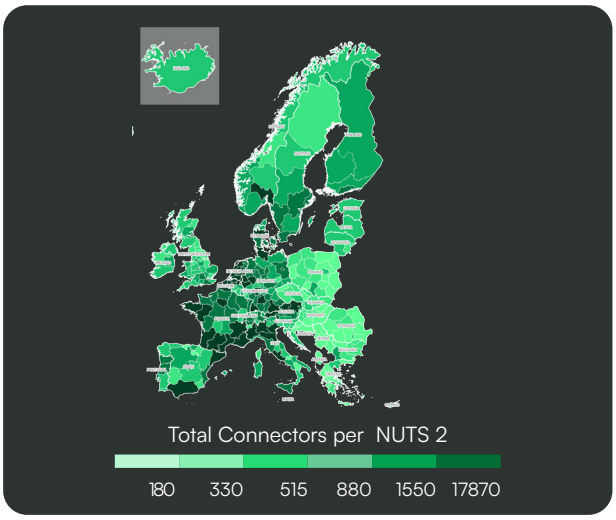
Looking at the distribution of AC connectors, we see a very similar map. This is due to the fact that AC connectors are still the most common in all markets. The clear leader here is—again without any surprise—the Netherlands, which was an early adopter of EVs and started incentivizing infrastructure development very early on, when AC charging was the standard. The amount of AC connectors on the market is so big that even without the DC connectors, it surpasses any other region in Europe. You can find the exact numbers in the regional analysis of Benelux.



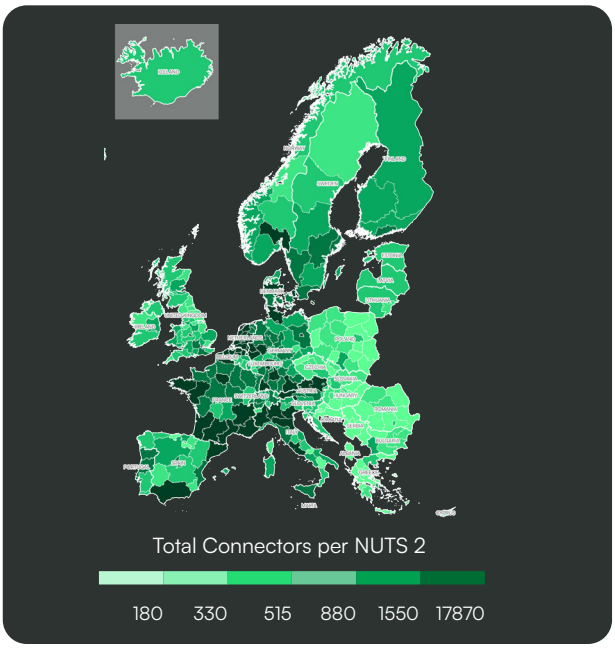
The distribution of DC connectors shows a very different picture compared to the distribution of AC connectors. The clear leader here is Norway. Worth noting here is France (Rhône-Alpes) and Germany (Oberbayern). Overall, we see two patterns. Regions that are wealthy and have higher EV shares naturally tend to have higher DC connector counts. The second outlier is regions with a lot of tourism and relatively low population density.



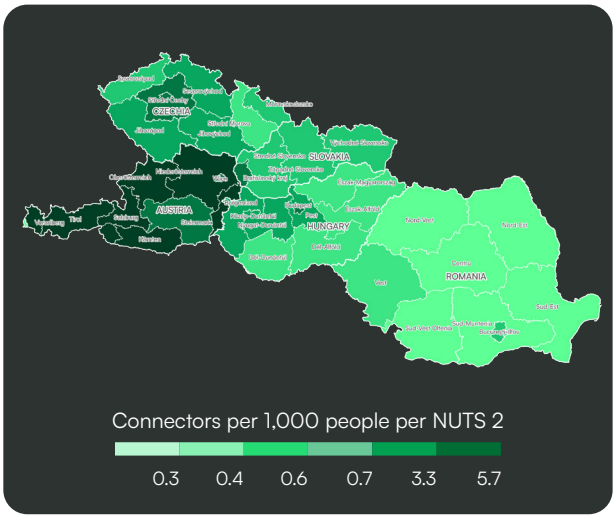
Another thing that is clearly visible is the east/west divide. Even though some of the Central and Eastern European regions are growing fast, they are incomparable with Western Europe when taking into account the total number of connectors, as well as AC and DC splits. There are, of course, some exceptions to this, especially in Ireland and some regions of Spain and Italy.



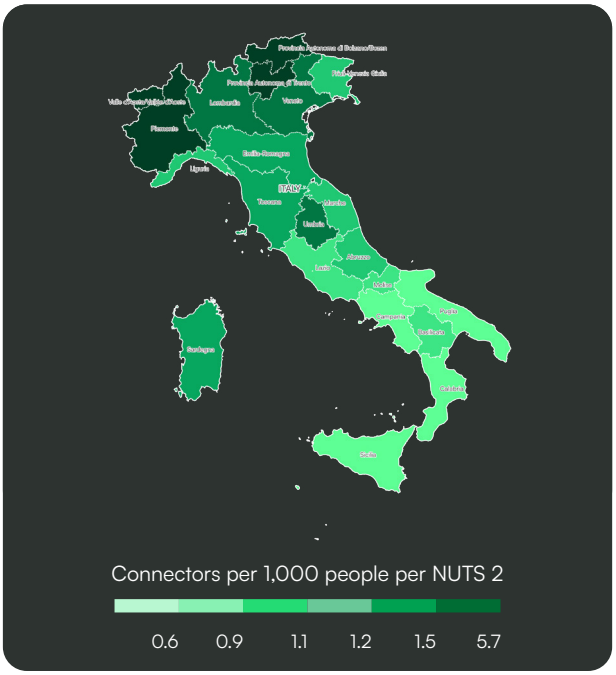
When we compare connectors per capita, the divide between East and West is even clearer.



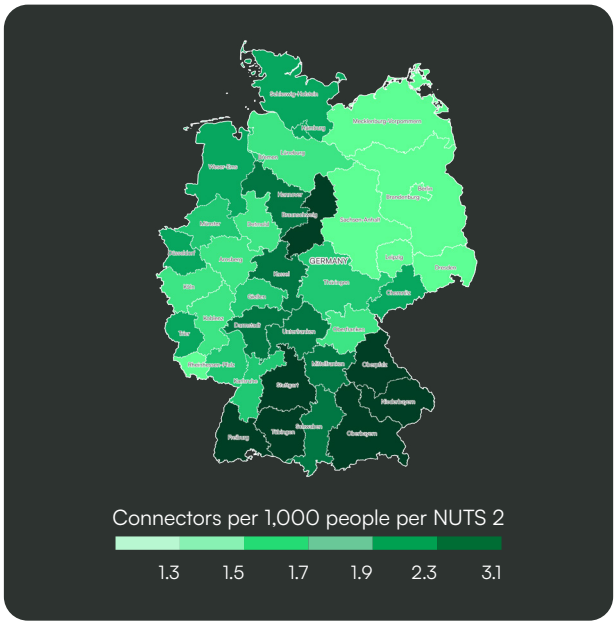
It's also interesting to look at regions and countries in more detail. Czechia, Slovakia, and Hungary have the most connectors per capita in their capital regions - around double compared to the rest. However, the situation in Austria is completely opposite. Vienna has several times fewer connectors per capita than the other regions - which reflects the amount of cars. Prague has 745 cars per 1,000 people, Bucharest 628, Bratislava 625, and Budapest 412, but Vienna only has 375 cars per 1,000 people.



And do you remember the bad geography joke about all statistics in Italy looking pretty much the same, with the north being the best, the centre kind of ok, and the rest the worst? Well, it turns out that it is sort of true also for EV charging—the north being the most developed region with the most amount of connectors, the centre somewhere in the middle and the south being the least developed.



The difference between Eastern and Western Germany is also not very difficult to spot. Regions that were part of the West are more developed and have higher connector counts compared to the Eastern regions.



Occupancy rates vary wildly by location.

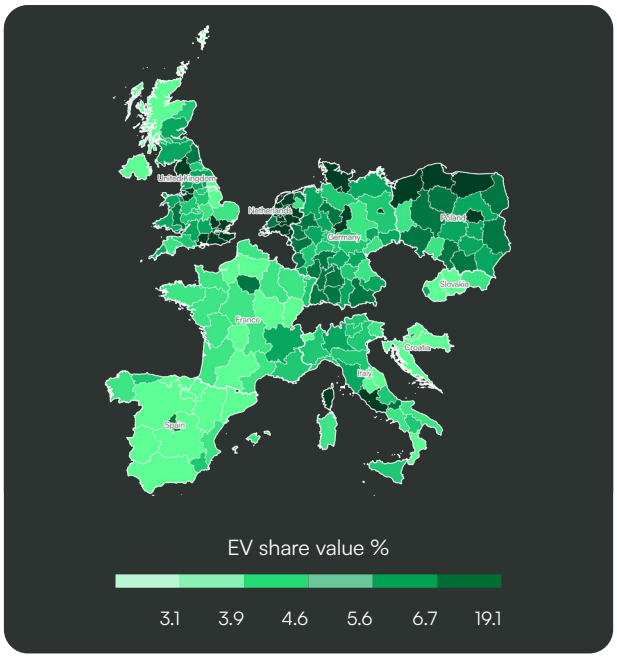
And what about the actual occupancy rates of the deployed infrastructure? We analysed data from DC connectors from several dozen CPOs across 9 markets—the UK, the Netherlands, Germany, France, Spain, Italy, Poland, Slovakia, and Croatia—and aggregated them on the NUTS 2 level. For a more granular analysis, we split the connectors in this chapter into DC (output power below 150 kW) and HPC (above and including 150 kW). At first glance, there are no apparent patterns of the HPC occupancy visible, with the only exception being the UK. Regions with very few HPC locations (< 5) tend to reach outstanding occupancy rates, in some cases surpassing 30 %. The overall occupancy rate average of the analysed markets for DC locations was 4.7 % (median value 4.1 %) and 7.5 % (median 6.5 %) for HPC locations.

And who are the occupancy rate winners? For DC locations, it is clearly the Netherlands, with the average reaching 7.4 %. One of the biggest surprises comes in the second place, occupied by Poland with 6.3 %. Given the EV penetration rate and overall development of the market, this is a very good performance. The third place is shared by the UK and Germany with very similar values of 5.6 % and 5.4 %, respectively. All the other markets performed below average—France and Italy just above 4 %, Slovakia and Croatia above 3 %. The worst performer (not only) in this metric is Spain with a meager 2.9 %.

Overall occupancy rate average of the analyzed markets for ***DC locations*** was ***4.7 % (median value 4.1 %)*** and ***7.5 % (median 6.5 %)*** for **HPC locations**

UK and Germany share the ***third place***, with very similar values of ***5.6 %*** and ***5.4 %***, respectively. All the other markets performed below average - France and Italy just above ***4 %***, Slovakia and Croatia above ***3 %***. Spain is the worst performer (not only) in this metric, with a measly ***2.9 %***

The UK took the prime for HPC locations with an outstanding average occupancy rate of 14.3 %. On the second spot, without a surprise, the Netherlands with 10.3 %, and third place goes to Germany with 9.3 %. France, Poland, Croatia, and Slovakia leave the competition without a medal, all ranking fourth with HPC occupancy rates between 6 and 7 %, followed by Italy with 5 %. The last place, again without a doubt, goes to Spain, with their occupancy average below 3 %, less than half of the average of all markets.

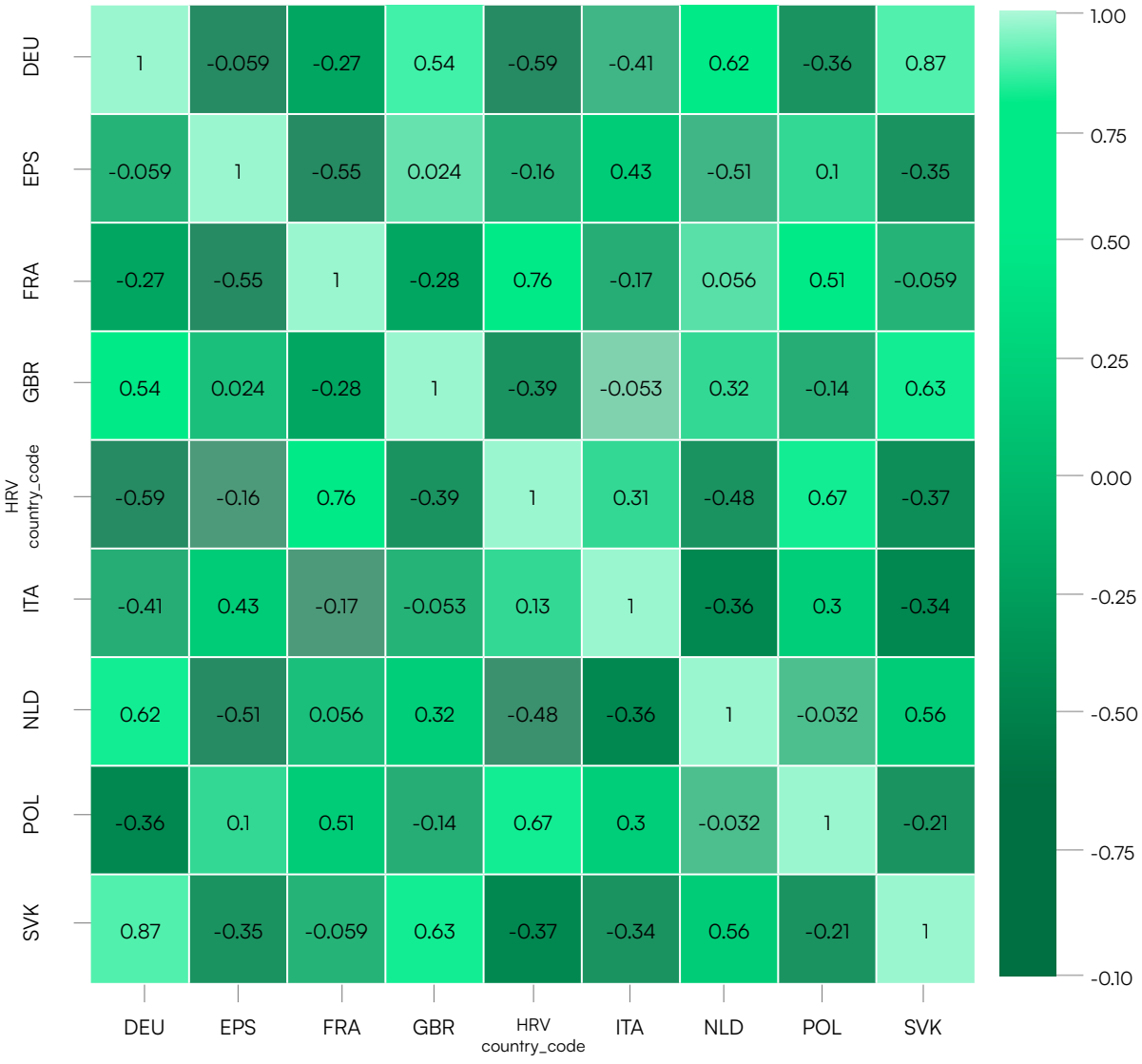


Looking at smaller geographical units, namely the NUTS 2 regions, the DC winner is UKI4 - Inner London - East (around 19 %), followed by FRM0—Corsica (almost 17 %), and PL91—Warszawski stołeczny (Warsaw region, 12.5 %).

The HPC occupancy rate chart on the NUTS 2 scale is dominated by the UK, taking 14 out of the top 15 regions (out of the total of 178 analysed NUTS 2 regions). It is led by UKI7—Outer London—West and North West, reaching almost 40 %, followed by UKM9 (Southern Scotland) and UKJ2—Surrey, East, and West Sussex (both around 33 %). As we wrote at the beginning of this chapter, these are regions with very few HPC locations, which tend to have much higher occupancy rates than regions with higher competition.

Strong seasonality and correlation between some markets

As mentioned above, we analysed the utilisation of DC charge points in 8 markets: the UK, the Netherlands, Germany, Italy, Spain, France, Slovakia, and Croatia. Some markets showed pretty clear seasonality—patterns that revealed the highest utilisation of charge points above 50 kW during the summer. These were of course the most notable in the southern markets, indicating that the increase in utilisation was mostly caused by foreign EV drivers on vacations. This assumption was also supported in our interviews with CPOs that are present in multiple markets. Another indicator is a negative correlation between Germany, the Netherlands, the UK, and Slovakia compared to Spain, France, Italy, and Croatia. Notable utilisation peaks were also visible on some markets along holidays such as Easter or Christmas.



A lot of locations are underutilised, and growth is driven by investments

Looking at the investments into CPOs in Europe in recent years, we can clearly see that there are a lot of expectations—and also a lot of pressure—from the side of investors. Just in 2024 alone, there were dozens of investments done.

Some more notable ones include:

- *€450* M for EDF
- *€304* M for Electra
- *€250* M for Driveco
- *€150* M for CEPSA
- *€100* M for Powerdot
- *€100* M for Bump Charge
- *€17* M for Atlante
- Undisclosed amount for InstaVolt

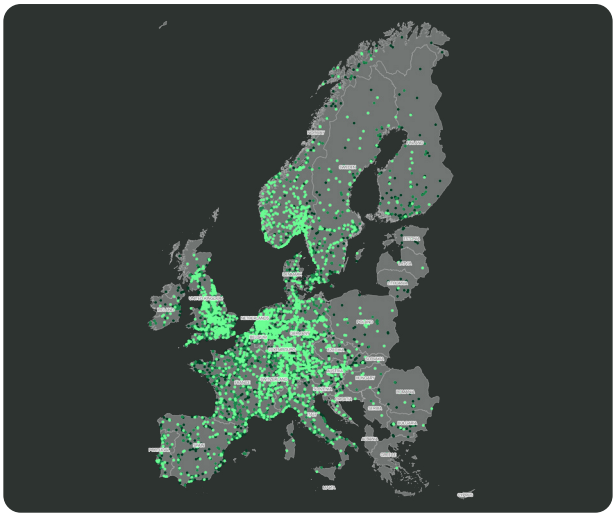
Although these investments used various tools to finance the deployment of charge points (such as VC, debt financing, and ICO), they all will have to make some returns in the near or more distant future.

Looking at the utilisation averages and the economics of charge points, it is clear that a lot of locations are underutilised and are unlikely to provide positive returns soon. This is one of the major questions we will focus on in the next edition of our report, which will be released next year.

Charging hubs becoming more popular and charging deserts disappearing.

One of the impacts of the battle for the best locations is the appearance and popularity of charging hubs. We define these as locations with at least 8 charge points from multiple CPOs. This does not come as a surprise, as the landlords—especially owners of shopping malls—want to provide a variety of brands to cater to a wide variety of customers who visit their locations. For consumers, these hubs are extremely reliable and convenient. They usually provide fast charging, shortening the stops to a minimum. Multiple charge points at a single location also mean that it is very likely that some of the outlets will be free to use. And of course, due to the nature of the locations, shopping malls provide a plethora of things to do while your car is charging.

In 2022, we observed just above 3,000 of these hubs across Europe, most of them being concentrated in the Nordics, the UK, as well as the Netherlands and Germany. Last year we already had more than 4,800 of such hubs, and this year we are already above 6,700 locations.



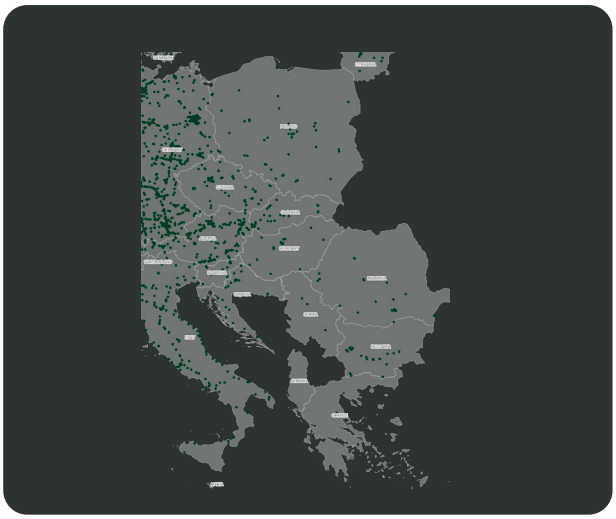
Charging hubs 2023 - 2024

hubs 2023 hubs 2024

We expect this trend to continue and expand to other parts of Europe, with charging hub clusters already present around the biggest cities in Central Europe and the Balkans.

As the big charging hubs spread across the continent, charging deserts are slowly but surely disappearing. No matter whether you are in the Southeast or North Europe, you should be able to find some charging stations nearby. Daily commutes are without any troubles; long-distance trips are a reality as well. Several players, such as IONITY and Fastned, focus on providing charging on the transcontinental TEN-T road network. In specific regions they are complemented by local and regional CPOs, providing a variety of options both for an overnight charge or a quick stop on the motorway.

Looking at the coverage, we can still identify areas without any EV charging, especially in the Balkans. Spain still remains the least covered by the Western European markets, followed by France. The Nordics are covered well, but most of the infrastructure is understandably located near population centres and roads connecting them. Large areas will remain uncovered due to the landscape of those markets.



Charging hubs 2024 Eastern Europe

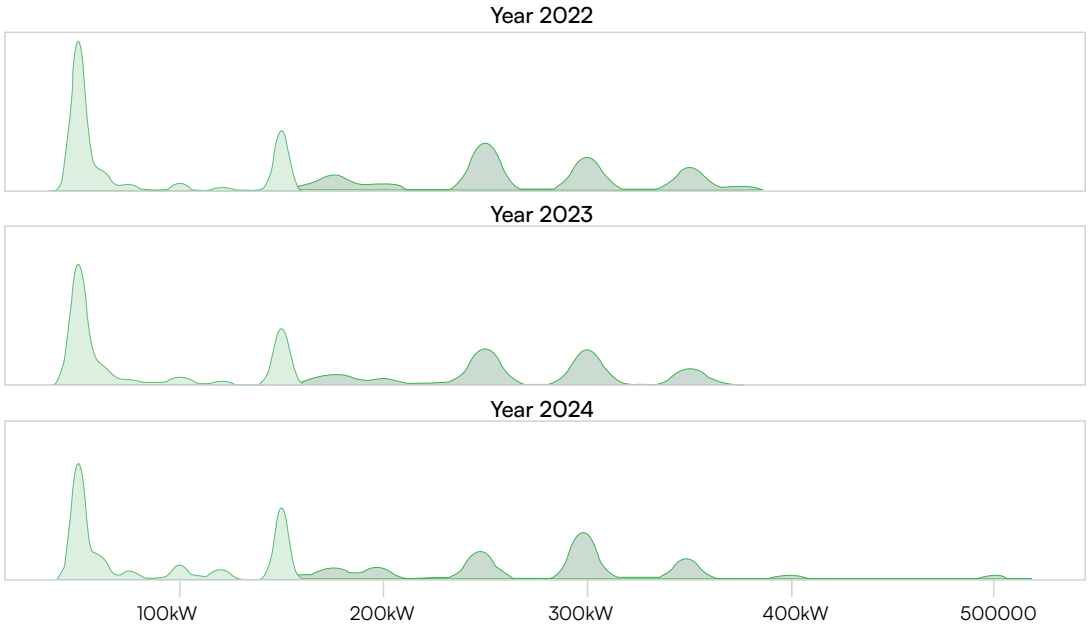
The output power of charge points is increasing.

If we look at the output power distribution across the years, we can clearly spot that it is increasing. While in 2022 there was 1 HPC on 3 DCs, in 2024 it's already 1 HPC on 2 DCs (HPC to DC ratio of 0.29 and 0.47, respectively). Worth noting here are Belgium, Germany, the Netherlands, Sweden, Iceland, and especially Denmark and Luxembourg, which have more HPCs than DCs (just a reminder: we define HPC as 150+ kW and DC as below 150 kW). While analysing the growth of the HPC to DC ratio, we found an unlikely champion. Bulgaria's ratio grew from 0.15 in 2022 to 0.58 in 2024, achieving one of the fastest growths in the whole of Europe. There are also markets in which DCs actually grew faster than HPCs and are still the norm for the time being, such as Lithuania, Greece, and Portugal. Croatia is the only market where the ratio did not change almost at all.

For DC charging, the 50 kW charge points are still the norm in most of the markets, although we definitely observed a decrease in this power type. Faster charge points are becoming more popular in this category, with 100 kW charge points growing the fastest together with 120+ kW ones.

High power charge points have seen the biggest increase, especially above 200 kW. Most notably, we can see a lot of new 300 and 350 kW charge points in the dataset.

Having said the above, it is not a surprise that the average power is increasing year on year. And whereas in 2022 and 2023 charge points with 400 and 500 kW were only outliers, in 2024 they became a solid part of the charging infrastructure. This year we also saw the emergence of megawatt charging systems, announcing the presence of e-trucks.

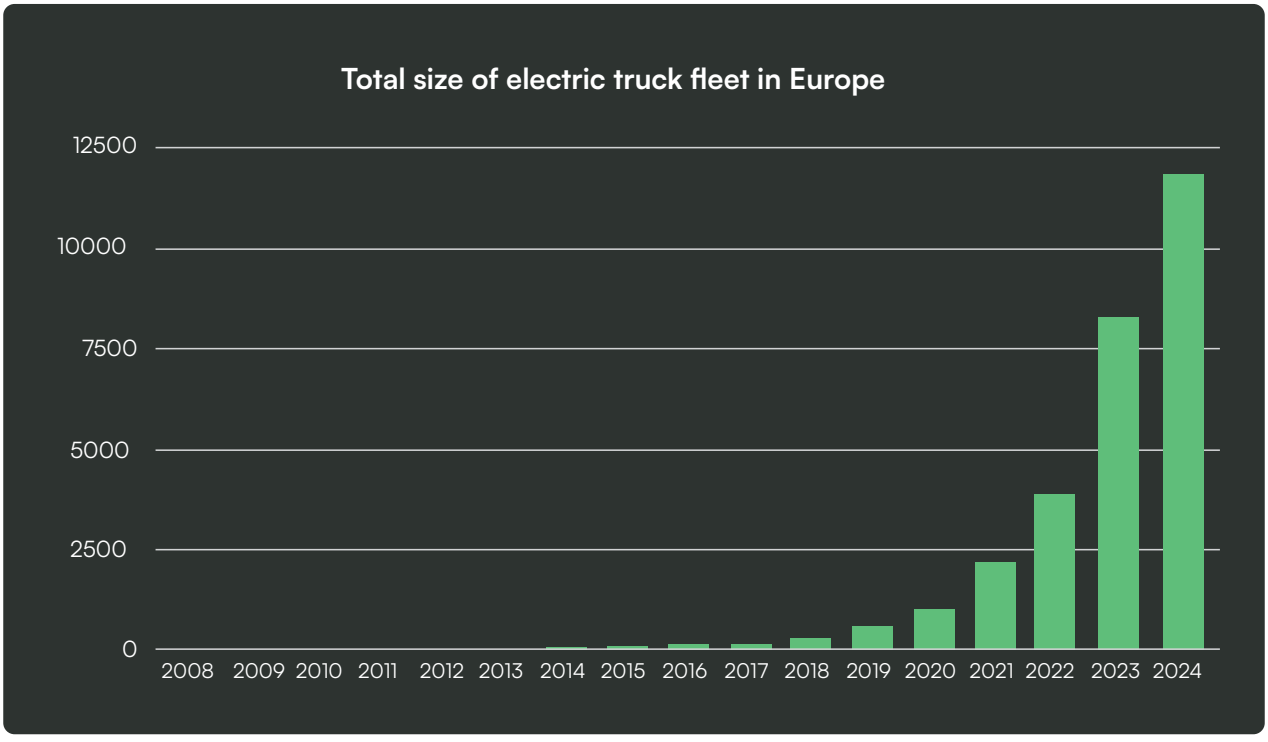


Truck charging starting to pick up the pace.

As the previous chapter suggests, the electric trucks are coming. We might even say they're already here.

The adoption started relatively slow, but the hockey stick chart showing the growth of e-trucks in Europe over the years is something any investor would like to see. That is also reflected in the interest of CPOs, with a lot of the established players from personal EV charging expanding to this niche. However, there are also completely new players emerging and starting to deploy MCS stations, most notably in the UK, Netherlands, Belgium, Germany, and the Nordics.

These markets are also the leaders in electric truck adoption. As of the writing of this report, there were more than 6 thousand e-trucks in Germany, followed by the UK with 3,400, and Norway with 1,400 registered units. France and the Netherlands are close behind, with both having just over 1 thousand registered electric trucks.



The economic factor is not the main reason to switch to an EV

Even though the economic factor is often cited as one of the most important in deciding to switch to an EV, data reveals it's not like that. Some countries show you could significantly save while driving an EV, but the adoption does not reflect that, such as Greece, Croatia, and Portugal, which are numbers 3, 4, and 5, respectively, in potential savings.

Ranking	Country	EV savings per 10k km (EUR)
1.	Iceland	1,368
2.	Norway	1,129
3.	Greece	1,037
4.	Croatia	984
5.	Portugal	979

EV & infrastructure targets are very optimistic but achievable

Looking at the data and trends in Europe, it is clear that the targets are very optimistic in some cases. However, they are not unachievable.

To meet them, we need to remove the bottlenecks and consolidate the market. These are the key areas that need improvement.

- **Grid capacity & connections**

  While talking to European CPOs, most of them mentioned the grid capacity and connecting their infrastructure to the grid as the biggest bottleneck. For example, in Poland, it can take up to two years to get your charge point connected, which prolongs the time to market and ROI significantly. Some CPOs employ innovative solutions, such as charging systems with integrated batteries and solar panels. It is also one of the reasons for the emergence and popularity of charging hubs. However, a more qualified workforce is still necessary to beat this problem.

- **Higher charging speeds, higher uptime, better user experience**

  To reach the mainstream and even the laggards, charging must become more convenient and seamless. We see that the charging speeds are increasing—together with better battery density, this ensures faster charging and longer ranges for EVs, removing the range anxiety of drivers. Standards such as Plug&Charge help with the user experience. In the coming years, we will most likely see a lot of consolidation in the market. Pricing will have to become more transparent as well. And of course, CPOs will have to make sure to have the highest possible uptime of their infrastructure.

- **Pricing**

  Some of the trends we observed (or at least CPOs are talking about implementing them) include dynamic pricing based on demand to redistribute the load and utilisation of charge points. The Offering will have to become more simplified to ensure the drivers understand how much they will pay. CPOs will also have to ensure a better price per kWh to make EVs more attractive for customers who do not have the possibility to charge at home.

- **EVs**

  It will not come as a surprise, but we still need a broader range of EVs to meet the requirements of the whole market. This is true both for the form factor—so far the automakers focused mostly on bigger cars—as well as the price tag—cheaper EVs will allow more drivers to switch to e-mobility. Range is still a factor and plays a significant role in decision-making.

Outlook

Although the market remained cautious, with multiple media outlets misguidedly suggesting the EV adoption stalled or even stopped, the future outlook remains positive. We do see a regional divide in this as well; although the Western part of Europe keeps on investing and the mood is positive, in the Eastern part both CPOs and investors remain cautious and are waiting for how the market situation will evolve. Luckily, the growth of EV charging infrastructure continues, motivating drivers to switch to EVs.

The year 2025 is forecasted to be one of the most important on our way to full EV adoption. EU climate targets will kick in full force, pushing the car manufacturers to keep the EV momentum. As the modelling by Transport & Environment suggests, the EV market share should reach between 20 to 24 per cent share.

2025

New affordable models (below €25k) will be key in some OEMs strategies

- Share of CO2 improvement from BEVs
- Share of CO2 improvement from HEVs and ICE improvements
- Share of CO2 improvement from PHEVs
- Share of CO2 improvement from regulatory flexibilities

Pool	CO2 improvements (T&E central scenario)	New BEV models	Growth of existing BEV models
BMW		Mini Aceman	BMW iX1, X3, i5, Mini Cooper, Countryman
Ford		Ford Puma, Capri	Ford Explorer
Hyundai		**Hyundai Inster**, new IONIQ EV	Hyundai IONIQ 5
Kia		Kia EV3, EV4, EV5	Kia EV7
Mercedes-Benz		Mercdes-Benz CLA, GLC, Smart #5	Smart #3, Fortwo, Mercdes-Benz G- Class
Renault pool		**Renault R5,** R4, new Nissan Leaf	**Dacia Spring,** Renault Megane, Scenic
Stellantis		**New Fiat Panda, Leapmotor T03,** Opel Frontera, Alfa Romeo Stelvio	**Citroën e-C3,** Alfa Romeo Junior Elettrica, Fiat 600, Peugeot e-3008
Toyota pool		Toyota bZ2X and bZ3X, Suzuki eVX	Toyota bZ4X
Volkswagen		**Cupra Raval,** Skoda Elroq, Audi A6 e-tron, Porsche Boxter, Cayenne	VW ID.3, ID.4, ID.7, Skoda Enyaq, Cupra Tavascan, Porsche Macan

Source: T&E analysis of carmakers compliance, T&E modelling of carmakers' compliance with sales forecasts for BEVs and hybrids in 2025 informed by GlobalData

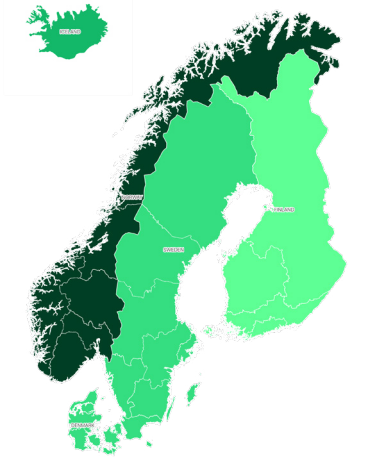
The key to success here will be the launch of more affordable EV models, allowing adoption to grow from early adopters to the majority of the population.

Another important aspect of the decarbonization of transport is the commercial fleet. Similar to personal vehicles, we expect the adoption of electric vehicles to continue in this segment as well. Given the EU targets and the economic factor, the growth of electric light commercial vehicles is poised to grow significantly. It might however be overshadowed by the electrification of long-haul transport, which should start to grow significantly in 2025 to meet the emission quotas.

Markets

As we already established in previous chapters, while analysing the market, Europe cannot be perceived as a whole but has to be split into geographical regions to understand the dynamics, trends, and outlooks. If you are interested in learning about the individual markets in more detail, please contact us at intelligence@zoniq.io.

Nordics



It comes as no surprise that the Nordic region is at the forefront of EV adoption. However, we can still see a significant difference in the adoption of EVs as well as the deployment of charging infrastructure among its markets. While Norway dominates almost all statistics—EV market share, EVs per capita, fast charging infrastructure per capita, and many more—Finland remains the laggard of the region. Still, compared to many other European countries, it retains a relatively strong position in EV adoption.

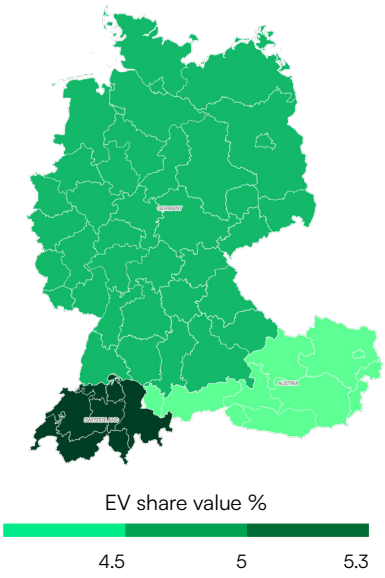
Most interesting statistics for Nordic countries:

- Norway has one of the biggest BEV fleets in Europe (749,960 BEVs) and the highest EV share (28 %)
- It is also a leader in DC charging with a DC to AC ratio of 48.5 %
- Due to the popularity of EVs in the country, it has one of the worst EV-to-charge point ratios (more than 33 EVs per charge point)
- Although Finland lags behind its neighbours in EV adoption, the infrastructure is rather developed and the BEV to DC ratio of 27.4 is much lower (Sweden and Denmark at around 52, Iceland above 73, Norway at almost 82 BEVs per DC charge point)
- Finland is also the only Nordic market with a BEV to PHEV ratio below 1, meaning there are more plug-in hybrids than BEVs on the market.

Stats for 2024 YTD (as of September 2024)

Country	BEV	PHEV	EV total BEV + PHEV)	EV share	AC	DC	EVSE Total (AC + DC)	Cars / EVSE	BEV / DC	DC / AC
Norway	749,960	192,135	942,095	28.09%	18,893	9,154	28,047	33.59	81.93	48.45%
Sweden	357,750	301,451	659,201	11.12%	40,006	6,918	46,924	14.05	51.71	17.29%
Denmark	34,8523	127,491	362,344	11.30%	26,755	4,537	31,292	11.58	51.76	16.96%
Iceland	31,144	25,980	57,124	15.59%	1,532	424	1,956	29.20	73.45	27.68%
Finland	99,343	122,303	221,646	5.01%	10,694	3,629	14,323	15.47	27.37	33.93%

DACH



The whole DACH region sits firmly in the middle of the pack for EV adoption, with shares around 5 %. Due to its size and economic development, Germany is one of the biggest EV charging markets in Europe, which is also reflected in the number of connectors in all categories.

Most interesting statistics for DACH countries:

- Germany has the biggest BEV, PHEV, and also total EV fleet, with other countries being nowhere near the size of it (the second UK has more than 60 % smaller fleet, France is almost half the size).
- Germany also has the most DC charge points deployed, with France close behind.
- In AC and total charge points it falls short of two other markets - more on that below.
- The EV to charge point, BEV to DC, as well as DC to AC ratios, are somewhat mediocre in all cases, with Austria being the clear leader in the former two (less than 9 EVs per charge point and around 34 BEVs per DC charge point)

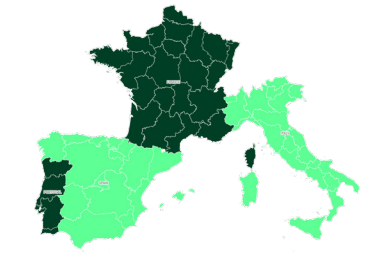
Occupancy rates for DC and HPC locations, Germany:

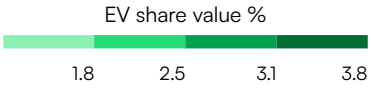
- The market performs well with national averages of 5.4 % and 9.3 % respectively
- The regional differences are still quite significant, with DC occupancy ranging from 3 % to 9.5 % and HPC from below 5 % to more than 15 %

Stats for 2024 YTD (as of September 2024)

Country	BEV	PHEV	EV share	AC	DC	Cars / EVSE	BEV / DC	DC / AC
Germany	1,618,103	1,155,423	4.88%	110,643	30,286	19.68	53.43	27.37%
Switzerland	182,345	105,436	5.30%	13,257	3,064	17.63	59.51	23.11%
Austria	177,004	65,559	4.13%	22,135	5,176	8.88	34.20	23.38%

Southern Europe





Even though economically some markets of Southern Europe stand proudly at the forefront of Europe, in EV adoption they have been infamously lagging behind their biggest rivals. The only exception—at least somewhat—is France. It has the third largest EV fleet in Europe and is one of the leaders in EV charging infrastructure as well, although a big part of it is AC. Italy and Spain are the biggest outliers in Europe, with their EV shares on par with the least developed regions of Central Europe, the Baltics, and the Balkans.

Most interesting statistics for Southern European countries:

- With almost a million BEVs, more than 600 thousand PHEVs, and a total EV fleet of close to 1.6 million units France takes the third place in Europe (after Germany and the UK)
- It ranks second in EV charging infrastructure with nearly 150 thousand charge points (after the Netherlands)
- However, only 18 % of all charge points are DC
- Italy and Spain have not only the lowest EV shares in the region (1.2 % and 1.4 % respectively), but are among the worst-performing markets in the whole of Europe - lower than Hungary, and just above Slovenia and Lithuania.
- Italy and Spain are also among the very few markets in Europe with BEV to PHEV ratio below 1 (PHEVs are more popular than BEVs)
- Portugal seems to be performing quite well with a 3.4 % EV share and all other statistics are somewhere in the middle.
- More infrastructure will be needed there to cover the demand with 22.6 EVs per charge point, or almost 46 EVs per DC charge point.
- Portugal also has the best DC-to-AC ratio in the region (36), well ahead of Spain (30.7), France (22), and Italy (19.5)

Occupancy rates for DC (below 150 kW) and HPC (150+ kW) locations, France:

- The market has a mediocre performance with national averages of 4 % and 6.7 % respectively
- The regional differences are very visible, with DC occupancy ranging from 2 % to almost 17 % and HPC from 4 % to almost 11 %

Occupancy rates for DC (below 150 kW) and HPC (150+ kW) locations, in Italy:

- The market has a mediocre performance with national averages of 4.1 % and 5 % respectively
- The regional differences are not as significant in DC occupancy (4 % to almost 7 %), but very prominent in HPC occupancy (3 % to 9 %)

Occupancy rates for DC (below 150 kW) and HPC (150+ kW) locations, Spain:

- The market has the worst performance of all analysed markets with national averages of 2.9 % and 2.8 % respectively
- The regional differences are not that apparent, with all NUTS 2 regions performing below average (both DC and HPC from 1 % to 6 %)

Stats for 2024 YTD (as of September 2024)

Country	BEV	PHEV	EV total BEV + PHEV)	EV share	AC	DC	EVSE Total (AC + DC)	Cars / EVSE	BEV / DC	DC / AC
France	987,821	610,026	1,597,847	3.77%	121,280	26,774	148,054	10.79	36.89	22.08%
Italy	281,843	296,406	578,249	1.21%	43,995	8,561	52,556	11.00	32.92	19.46%
Spain	189,553	226,413	415,966	1.38%	25,418	7,790	33,208	12.53	24.33	30.65%
Portu-gal	126,234	107,981	234,215	3.36%	7,626	2,749	10,375	22.57	45.92	36.05%

Benelux

EV share value %

2 3

With an EV fleet of 810 thousand units, the Netherlands ranks fifth in Europe. The whole region was among European early adopters of EVs, which led to one of the highest EV penetrations across the continent. Unfortunately, it also led to a wide deployment of slower AC charge points that are becoming somewhat redundant in a lot of cases. On one hand, they allow for widespread EV adoption because even drivers without their own garage can charge their EVs overnight at home. On the other hand, they lock up a lot of grid capacity, which is then not available for faster DC charge points that would be required in other use cases. And even though the Netherlands leads the ranking in the amount of deployed charge points, it has the worst DC-to-AC ratio, with Belgium close behind and Luxembourg in a similar position.

Most interesting statistics for Benelux countries:

- Almost 1.4 million EVs are concentrated in this small and densely populated region, bringing it close to the UK and France - countries 5 and 12 times bigger respectively
- 162 thousand deployed charge points bring the Netherlands to the number one spot
- It only has less than 5 thousand DCs, similar to Austria or Denmark Netherlands, Belgium, and Luxembourg have some of the worst DC-to-AC ratios in Europe (3.15, 6.21, and 13.5, respectively)
- Netherlands, Belgium, and Luxembourg have some of the worst DC-to-AC ratios in Europe (3.15, 6.21, and 13.5 respectively)
- The mini-state of Luxembourg has one of the worst infrastructure statistics in Europe with just around 2,300 charge points, 22 EVs per charge point, and a staggering 114 BEVs per DC - this might be also due to the fact that a lot of people commute and might charge elsewhere, for example in France, Germany, or Belgium.

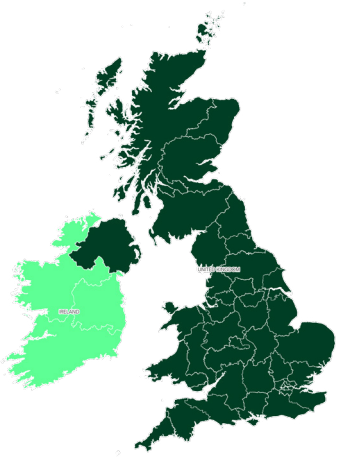
Occupancy rates for DC (below 150 kW) and HPC (150+ kW) locations, in the Netherlands:

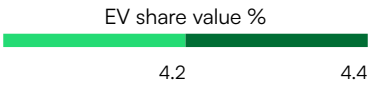
- The market is a top performer, especially in DC occupancy (7.4 %) and performs exceptionally well in HPC as well (10.28 %)
- Some Dutch regions lag behind with DC occupancy below 4 %, but most performing very well (between 6 % and 10.5 %)
- HPC occupancy differences are also still visible, with their regional averages between 6 % and almost 14 %
- Even though the region is quite developed, Belgium still has significantly more PHEVs than BEVs in its fleet, with a BEV to PHEV ratio of 0.71

Stats for 2024 YTD (as of September 2024)

Country	BEV	PHEV	EV total BEV + PHEV)	EV share	AC	DC	EVSE Total (AC + DC)	Cars / EVSE	BEV / DC	DC / AC
Nether-lands	494,601	315,831	810,432	7.90%	157,179	4,945	162,124	5.00	100.02	3.15%
Belgium	215,632	305,551	521,183	7.03%	63,173	3,921	67,094	7.77	59.51	6.21%
Luxem-bourg	31,435	19,454	50,889	9.42%	2,045	276	2,321	21.93	113.89	13.50%

UK & Ireland





Just ahead of France, the UK has the second biggest EV fleet in Europe, counting more than 1 million EVs and 640 thousand PHEVs. The EV penetration rate of 4.44 % is on par with its biggest rivals—Germany (4.88 %) and France (3.77 %). And even though the charging infrastructure is of significant size—4th in total size and 3rd in DC charge points—compared to the EV fleet, it is rather insufficient, with 21 EVs per charge point and almost 74 BEVs per DC charge point. EV drivers in Ireland are in a similar— even though somewhat more difficult situation. The interest is definitely there; as the penetration rate of 3.91 % puts it in the middle of the statistics, it lags behind in charging infrastructure quite significantly. It has the worst ratio of EVs to charge points (34.2) and is also second to last in BEV to DC charge points (108.32).

Most interesting statistics for the UK & Ireland:

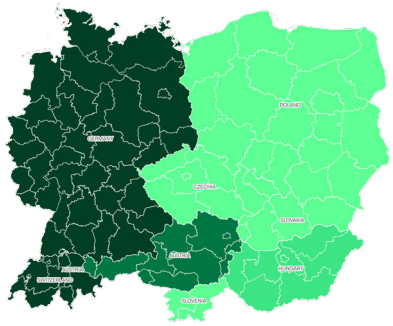
- 1,721,380 is the total number of EVs in the UK
- It has 66 thousand deployed AC and almost 15 thousand DC charge points
- Ireland has some of the worst infrastructure-to-cars ratios, with more than 34 EVs per charge point and more than 108 BEVs per DC charge point.

Occupancy rates for DC (below 150 kW) and HPC (150+ kW) locations, in the UK:

- The market performs the best of all analysed markets in HPC occupancy rates (14.28 %), while DC is just slightly above average (5.57 %)
- It has the worst regional variance in both DC (occupancy ranging from 0.4 % to 19 %) and HPC (2.5 % to almost 40 %)

Country	BEV	PHEV	EV total BEV + PHEV)	EV share	AC	DC	EVSE Total (AC + DC)	Cars / EVSE	BEV / DC	DC / AC
UK	1,080,740	640,640	1,721,380	4.44%	66,079	14,615	80,694	21.33	73.95	22.12%
Ireland	68,673	42,658	111,331	3.91%	63,173	634	3,255	34.20	108.32	2,621

Central Europe



EV share value %

1.2 2.0 2.8 3.7 4.5 5.3

In terms of EV adoption, the Central European markets of Poland, Czechia, Slovakia, and Hungary are still lagging behind more developed regions, such as the Nordics or Western Europe. The regional leader is quite surprisingly Hungary with 1.53 %, putting it even ahead of Italy and Spain and also well above everyone else in the region. Everyone else is at the very end of the EV penetration ranking, with the last 5 places shared between these and Balkan markets. The situation in charging infrastructure is the exact opposite, with Slovakia performing particularly well with just 6 EVs per charge point and 11 BEVs per DC charge point (only Bulgaria has less but more on that below). The DC to AC ratio is also quite good in Slovakia, Poland, and Czechia—all of them above 40—compared to less than 27 in Hungary. Hungary also has considerably more EVs per charge point (20), as well as BEVs per DC (68).

Most interesting statistics for Central European countries:

- Poland has a very low EV penetration rate of just 0.36 %, making its EV fleet size comparable to Ireland - a market several times smaller
- Hungary outperforms all of its peers at least 3-fold with 1.53 % of its fleet already electrified
- It also favours BEVs over PHEVs to such a point, that it's one of the best-performing markets in the whole of Europe
- Slovakia has the second-best BEV to DC ratio on the continent, with just 11 cars per DC charge point
- It shines in DC to AC as well, putting it in the top 10 in this metric (just above Czechia and Poland)

Occupancy rates for DC (below 150 kW) and HPC (150+ kW) locations, Poland:

- This market is one of the biggest surprises among all analysed markets, performing quite well in DC occupancy (6.31 %), while HPC is just below average (6.48 %)
- The regional differences are still huge, with DC occupancy as low as 3 %, but also reaching 12.5 %
- HPC occupancy rates are also clearly visible, going from 3.5 % to almost 14 %

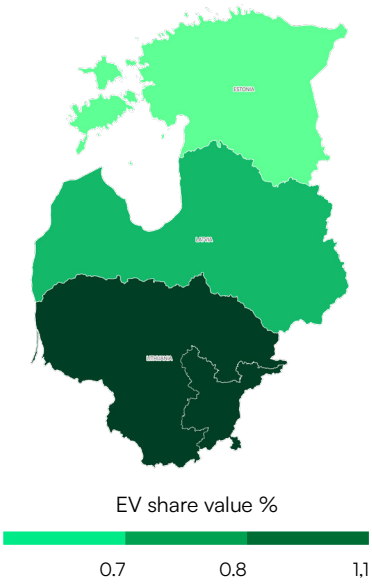
Occupancy rates for DC (below 150 kW) and HPC (150+ kW) locations, Slovakia:

- The smallest of all analysed markets in size, with performance slightly below average (average DC occupancy rate of 3.48 % and HPC 6.04 %)
- It is interesting to see that even in such a small market with just 4 NUTS 2 regions, the regional differences are clearly visible (DC from 2 % to 5.5 % and HPC from 4 % to almost 8 %)

Stats for 2024 YTD (as of September 2024)

Country	BEV	PHEV	EV total BEV + PHEV)	EV share	AC	DC	EVSE Total (AC + DC)	Cars / EVSE	BEV / DC	DC / AC
Poland	56,270	52,061	108,331	0.36%	5,982	2,560	8,542	12.68	21.98	42.80%
Czechia	27,658	19,396	47,054	0.53%	3,929	1,618	5,547	8.48	17.09	41.18%
Slovakia	9,041	8,254	17,295	0.57%	1,854	845	2,699	6.41	10.70	45.58%
Hungary	56,685	22,074	78,759	1.53%	3,127	833	3,960	19.89	68.05	26.64%

Baltics



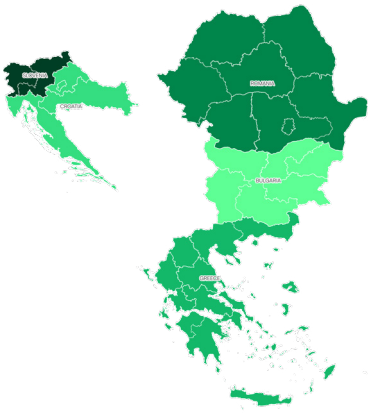
The smallest region shares a lot of similarities with its Eastern European peers from Central Europe and the Balkans. The EV penetration ranges from 0.63 % to 1.11 %. The EV to charge point, as well as BEV to DC ratios, are among the best in Europe, with Estonia having just 7 EVs per charge point and 13 BEVs per DC charge point. The DC to AC ratio is also the best in this small Baltic country—outperforming the second-best Bulgaria by a margin.

Most interesting statistics for Baltic countries:

- Lithuania, Latvia, and Estonia have very low EV penetrations of just 1.11 %, 0.75 %, and 0.63 % respectively
- The region shines in infrastructure, with just 7 to 10 EVs per charge point and 13 to 17 BEVs per DC charge point
- Its markets also have some of the best DC-to-AC ratios, with 0.75, 0.55, and 0.54 for Estonia, Latvia, and Lithuania
- BEVs are significantly more popular in Latvia and Estonia than PHEVs, with the former being one of the European leaders in this metric (4.5 BEVs per 1 PHEV), losing just to Slovenia.

Country	BEV	PHEV	EV total BEV + PHEV)	EV share	AC	DC	EVSE Total (AC + DC)	Cars / EVSE	BEV / DC	DC / AC
Estonia	5,121	1,555	6,676	0.63%	519	391	910	7.34	13.10	75.34%
Lithuania	12,295	8,180	20,475	1.11%	1,352	731	2,083	9.83	16.82	54.07%
Luxem-bourg Latvia	5,703	1,286	6,989	0.75%	607	331	938	7.45	17.23	54.53%

Balkans



EV share value %

0.27 0.43 0.57 0.58 1.15

Balkan markets are at the very end of EV adoption in Europe. Bulgaria—in size of personal vehicle fleet comparable to Norway—has just about 9 thousand EVs on its roads. Norway has around 100 times more. It is then no surprise that it performs very well in EV charging, beating all other European markets in EVs per charge point (~3.5) and BEV per DC (~6). No other country is even comparable in this regard. The EV penetration leader in the region is Slovenia. On the other hand, it lacks EV charging infrastructure and also relies mostly on AC charging—similar to Greece, which has the worst DC to AC ratio in the whole continent (0.13). Greece clearly favours PHEVs, having almost 2 registered hybrids for each BEV—the worst in Europe—which probably explains its prevalence in AC charging.

Most interesting statistics for Balkan countries:

- Slovenia leads the regional EV penetration with 1.15 % of its fleet electrified
- Bulgaria has the best EV to charge point and BEV to DC ratios in Europe (3.45 and 6.11 respectively)
- Bulgaria is also among the best in DC to AC (0.62, second to Estonia with 0.75)
- Greece has one of the lowest DC-to-AC ratios (0.13)
- PHEVs are the most popular in Greece (BEV to PHEV at 0.65)

Occupancy rates for DC (below 150 kW) and HPC (150+ kW) locations, Croatia:

- Of all the analysed markets, Croatia bears a significant resemblance to France and Slovakia, with average performance on both DC (3.28 %) and HPC (6.36 %)
- On the regional level, the differences are not that prominent, with DC occupancy rates ranging from 2.6 % to 4.7 % and HPC from 5 % to almost 9 %

Country	BEV	PHEV	EV total BEV + PHEV)	EV share	AC	DC	EVSE Total (AC + DC)	Cars / EVSE	BEV / DC	DC / AC
Slovenia	14,433	3,201	17,634	1.15%	1,611	390	2,001	8.81	37.01	24.21%
Croatia	6,411	3,489	9,900	0.43%	1,050	549	1,599	6.19	11.68	52.29%
Romania	44,953	13,145	58,098	0.58%	2,491	1,431	3,922	14.81	31.41	57.45%
Bulgaria	6,323	3,023	9,346	0.27%	1,671	1,035	2,706	3.45	6.11	61.94%
Greece	16,301	24,911	41,212	0.57%	5,827	765	6,592	6.25	21.31	13.13%

Methodology

Our methodology for data collection and analysis involved a multi-faceted approach to ensure accuracy and comprehensiveness. We categorised charge points according to the AFIR classification, and occupancy rates, which are based on one year of data from June 2023 to May 2024, were calculated at the connector level and then aggregated to NUTS 2 and country levels for broader insights. The connector dataset specifically uses data from July 2024 to ensure the latest information is included.

Sources

We used a combination of open-source and licensed datasets, integrating them with the outputs of our proprietary models and other datasets developed in-house at Zoniq. We used the most up-to-date datasets where possible.

The most notable data sources are listed below:

- *European Alternative Fuels Observatory*
- *Eco-Movement*
- *Hubject*
- *OpenStreetMap*
- *Eurostat*
- *National, regional, and European open data sources*

Abbreviations

- EVSE - electric vehicle supply equipment
- AC - alternating current charge point of all output power categories
- DC - direct current charge point of output power categories below 150 kW
- HPC - high-power charge point; DC charge point of output power categories above (and including) 150 kW
- MCS - megawatt charge point
- CPO - charge point operator
- EMSP — e-mobility service provider
- EV - electric vehicle
- BEV - battery electric vehicle
- PHEV - plug-in hybrid electric vehicle
- EREV - extended range electric vehicle
- ICE - internal combustion engine vehicle

About the authors

Zoniq speeds up the adoption of electric vehicles by developing the closest thing to a crystal ball for understanding the public charge point demand, providing essential insights to charge point operators, grid networks, and governments.

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We would like to express our gratitude to everyone who helped us create this Report and contributed with their expertise, experience, and learnings from the markets.

(in alphabetical order)

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Powerdot
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Impressum

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