gridX

Charging Report 2026

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An original and comprehensive analysis of Europe's EV charging landscape using publicly available data.

Executive summary

Europe's electric vehicle and public charging infrastructure markets are slowing in growth but accelerating in capacity, driven by a clear shift toward high-power charging. For charge point operators (CPOs), profitable scaling now hinges on smart energy management to tackle grid constraints, cut costs and unlock flexibility-driven revenue.

The market matures but growth slows

Europe's e-mobility market is maturing. In 2025, BEV growth slowed to 28% (from 33% in 2024), while public charge point expansion dropped to 19% (from 37%). This reflects a natural plateau as the market scales, with over 1.2 million public charge points now deployed, nearly five times the 2020 levels. However, the charging capacity growth is accelerating, reaching 36% in 2025, up from 23% the previous year.

A clear shift toward high-power charging

Despite slower asset growth, charging capacity continues to accelerate. The share of ultra-fast chargers (>150 kW) and fast-charging hubs is rising notably, signaling a visible transition toward high-performance infrastructure. Installed capacity per BEV already exceeds regulatory benchmarks, proving that operators are shifting focus from simple network expansion to performance optimization and high-speed reliability.

BEVs are cheaper and drive further

The EV market is diversifying as 63 new BEV models launched in 2025 alone. While average retail prices fell, signaling a shift toward economic mass-market options – range and battery capacity remained stable. This indicates that rapid advancements in battery technology are maintaining performance at lower costs, effectively reducing range anxiety and driving sustained consumer demand.

Nordics and Benelux still lead the charge

Significant regional differences persist. The Nordics and Benelux remain leaders in both EV adoption and charging infrastructure, while DACH countries, France and the UK follow closely behind. Meanwhile, Eastern Europe is emerging as a high-growth region, with countries like Estonia, Latvia and Romania leading in charging capacity expansion. This geographic diversification highlights new opportunities for infrastructure investment.

Survey finds grid constraints major barrier

As CPOs scale high-power charging, grid limitations have become the most critical bottleneck. Securing sufficient grid capacity for new sites is consistently seen as the top challenge and integrating batteries has become the new focus. Market trends show that returns are concentrated on a shrinking number of operators with clear corridor strategies and long-term competitiveness is contingent on continent-wide networks, depot investments and smart energy management.

Flex is emerging as a strategic imperative

Technologies such as dynamic load management, peak shaving and virtual grid expansion enable CPOs to deploy more chargers without costly grid upgrades. Beyond cost savings, aggregating EV flexibility opens up new revenue streams through energy trading and grid services. As the market evolves, competitive advantage will depend not only scale but also on how effectively charging networks are orchestrated, optimized and monetized.

Things to note

The following pages aim to summarize the current state and future outlook of EV charging infrastructure in Europe with a particularly close look at Germany, the Netherlands and the United Kingdom. Please keep in mind that we rely on publicly available data and – given the sheer amount and our limited resources – we are unable to verify every detail. When reading this report, it's important to note the points below.

Data

All data was sourced from publicly available sources and analyzed internally. We have done our best to remove duplicates and errors. Overall, we are confident that the data closely reflects the state of charging infrastructure in Europe. The data was collected in February – March 2026.

Definitions

BEV/EV: Battery electric vehicles (BEVs) are fully electric plug-in vehicles. For the purpose of this report, plug-in hybrid electric vehicles (PHEVs) are excluded, as we focus exclusively on fully electric passenger cars.

Electric vehicle charging infrastructure (EVCI): The physical equipment and network systems required to charge electric vehicles at public and semi-public locations.

Charger categories: Various definitions exist for categorizing charge points by speed. For this report, we utilize the following classifications:

Slow chargers: ≤ 7.4 kW
Average chargers: 7.4 kW < CP ≤ 22 kW
Fast chargers: 22 kW < CP < 150 kW
Ultra-fast chargers: CP ≥ 150 kW

Charge point (CP): Following AFIR classification, a CP is any publicly available device that charges one EV at a time. Although a device may have multiple connectors, it counts as a single CP if only one can be active at once. This excludes semi-public stations, such as those at workplaces.

Charge point operator (CPO): A pivotal player in the electric mobility industry, responsible for building, installing and maintaining EV charging stations.

Charging station: A site with one or more charge points.

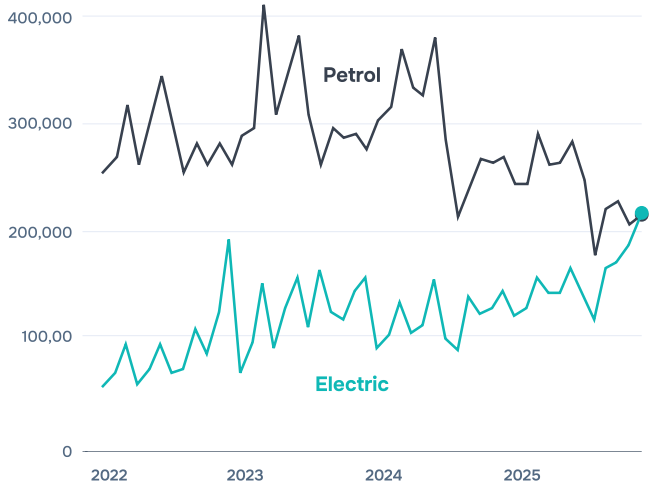
Grid connection point (GCP): The specific location where a grid user is physically connected to the grid infrastructure.

PV: Photovoltaic (solar system)
BESS: Battery energy storage system

Electric and petrol vehicles reach parity in Europe, with a short-term boost expected

EVs outsold petrol cars in the EU for the first time

MONTHLY EU REGISTRATIONS OF BATTERY EVS AND PETROL CARS (2025)



Sources: 1-2

December 2025 marked the first month in which battery electric vehicles (BEVs) (217,898) surpassed petrol cars (216,492) in new EU registrations. While petrol still leads over the full year, this crossover shows that electric vehicle (EV) growth is becoming consistent and self-sustaining rather than dependent on short-term policy spikes.|

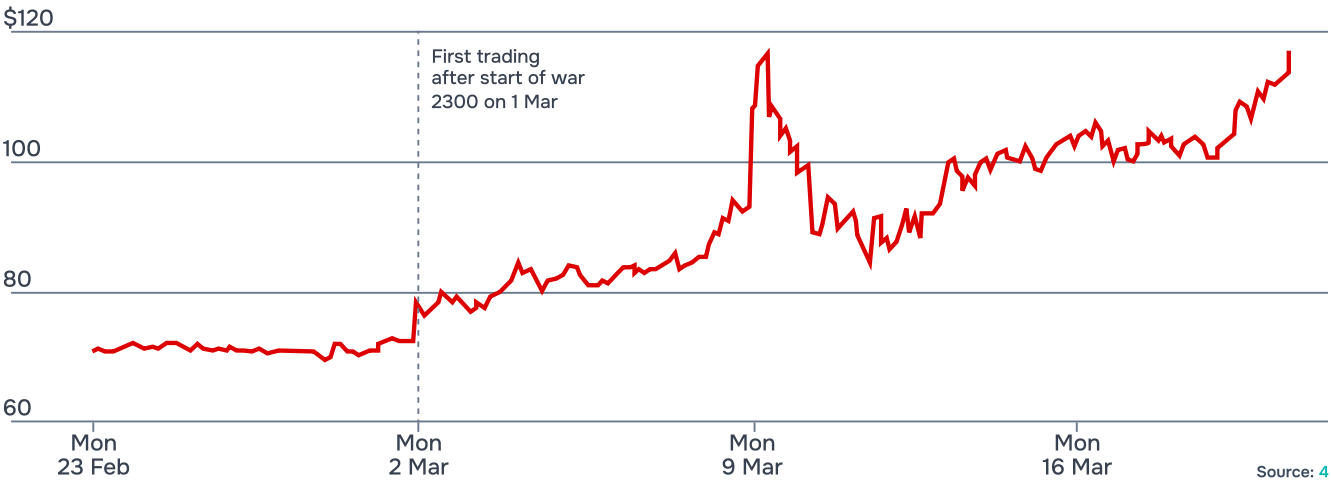
For charging infrastructure, this means demand is now steadily increasing. Therefore, overall business strategy should reflect this consistent EV growth, with more attention to when and how chargers are used and not just how many are installed.

Oil prices increased by 60% in the weeks following the start of the war in Iran, already causing surges in EV adoption

As gas and oil supply becomes scarce and prices surge, the case for electrification strengthens. In fact, French online used-car retailer Aramisauto reported its share of EV sales almost doubled from the week starting February 16 to the week starting March 9, rising from 6.5% to 12.7%. [3] Over the same three weeks, petrol model sales fell from 34% to 28% and diesel dropped from 14% to 10%.[4]

Oil prices have risen sharply since the start of the Iran war

Brent crude, $ barrel (hourly)

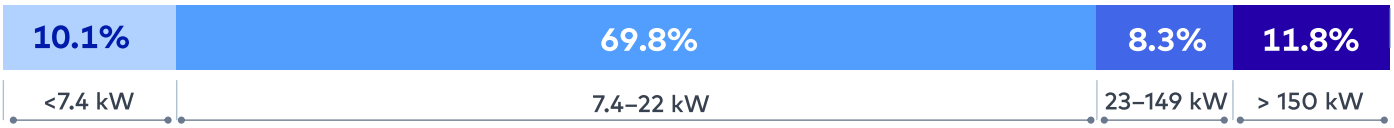


Source: 4

This teases a renewed focus on electric vehicles, as well as cost-effective, fast charging in 2026, following a slight dip in growth trends in 2025. Let's take a look at the EV and charging trends from 2025.

Rate of CP growth slows, capacity increases

EU27 + Iceland, Liechtenstein, Norway, Switzerland and the UK



11,398,731 BEVs (+2.47M)

1,215,706 Public chargers (+195k)

28% YoY increase in BEVs (-7pp)

19% YoY increase in CPs (-18pp)

21.4 BEVs/1,000 inhabitants (+3.6)

3.9 Public charge points/1,000 inhabitants (+1.9)

48.1 GW Total charging capacity (+12.7 GW)

43 kW Average speed (+1kW from 2024)

4.2 kW public charging capacity / BEV (+0.3)

36% YoY increase in capacity (+13pp)

The rate of increase dropped for both BEVs (down by seven percentage points) and charge points (down by 18 percentage points) in 2025. However, the average charging speed continued to rise, reflecting a steady shift toward high-power charging. In line with this, the share of ultra-fast chargers grew significantly (from 9.8% to 11.8%). The installed charging capacity per BEV is already well above the AFIR target of 1.3 kW, showing that charging infrastructure is ahead of BEV uptake.

BEVs are more diverse, cheaper and have a higher range

AVAILABLE BEV MODELS IN EUROPE

463 (+63)

AVERAGE RETAIL PRICE

€65,061 (-€2.8k)

AVERAGE BATTERY CAPACITY

73.3 kWh (-0.5)

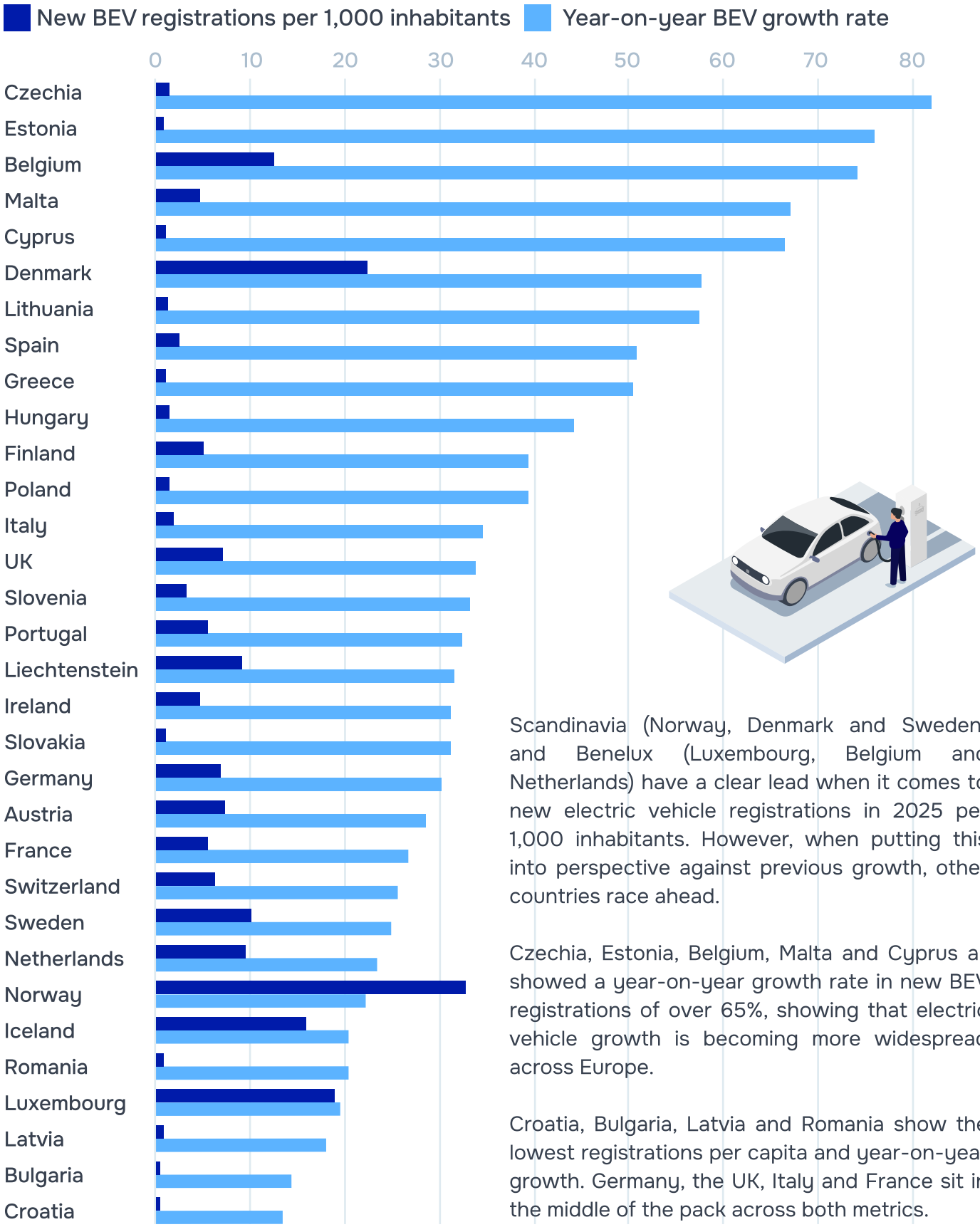
AVERAGE RANGE

390.3 km (+1)

The range of BEVs is increasing: 63 new models became available on the market in 2025 alone. The average retail price decreased, showing more economic mass market models are being produced, but the range and battery capacity remained stable, showing that battery technology is advancing rapidly, making range anxiety less of an issue for consumers.

Disclaimer: This and the following data come from the European Commission (Source 5), which we have processed and analyzed ourselves alongside population data (Source 6). Although we have done our best to ensure the accuracy of this information, we cannot guarantee that it is 100% correct.

Northern Europe leads in new BEVs per capita, while Eastern and Southern Europe have the strongest growth

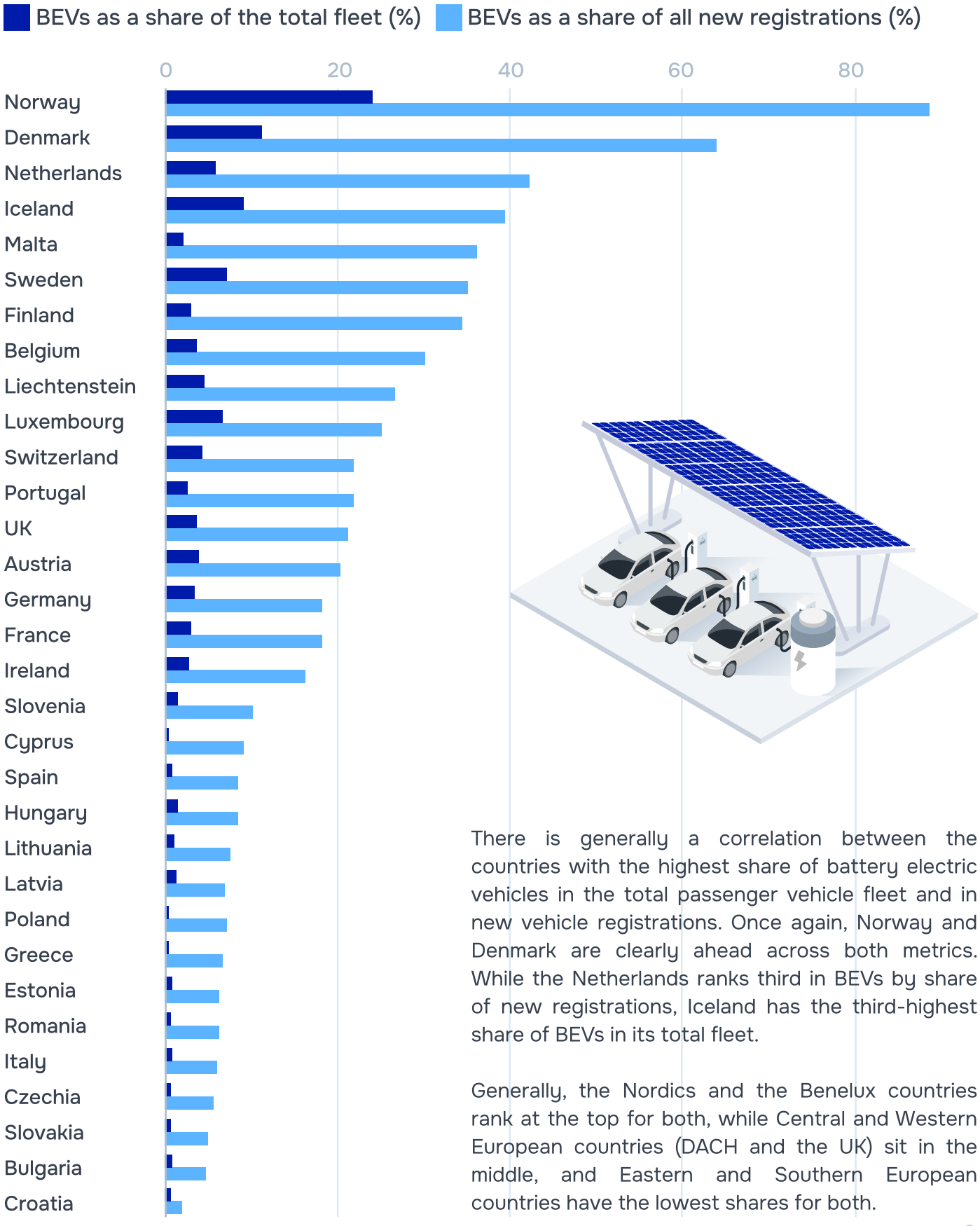


Scandinavia (Norway, Denmark and Sweden) and Benelux (Luxembourg, Belgium and Netherlands) have a clear lead when it comes to new electric vehicle registrations in 2025 per 1,000 inhabitants. However, when putting this into perspective against previous growth, other countries race ahead.

Czechia, Estonia, Belgium, Malta and Cyprus all showed a year-on-year growth rate in new BEV registrations of over 65%, showing that electric vehicle growth is becoming more widespread across Europe.

Croatia, Bulgaria, Latvia and Romania show the lowest registrations per capita and year-on-year growth. Germany, the UK, Italy and France sit in the middle of the pack across both metrics.

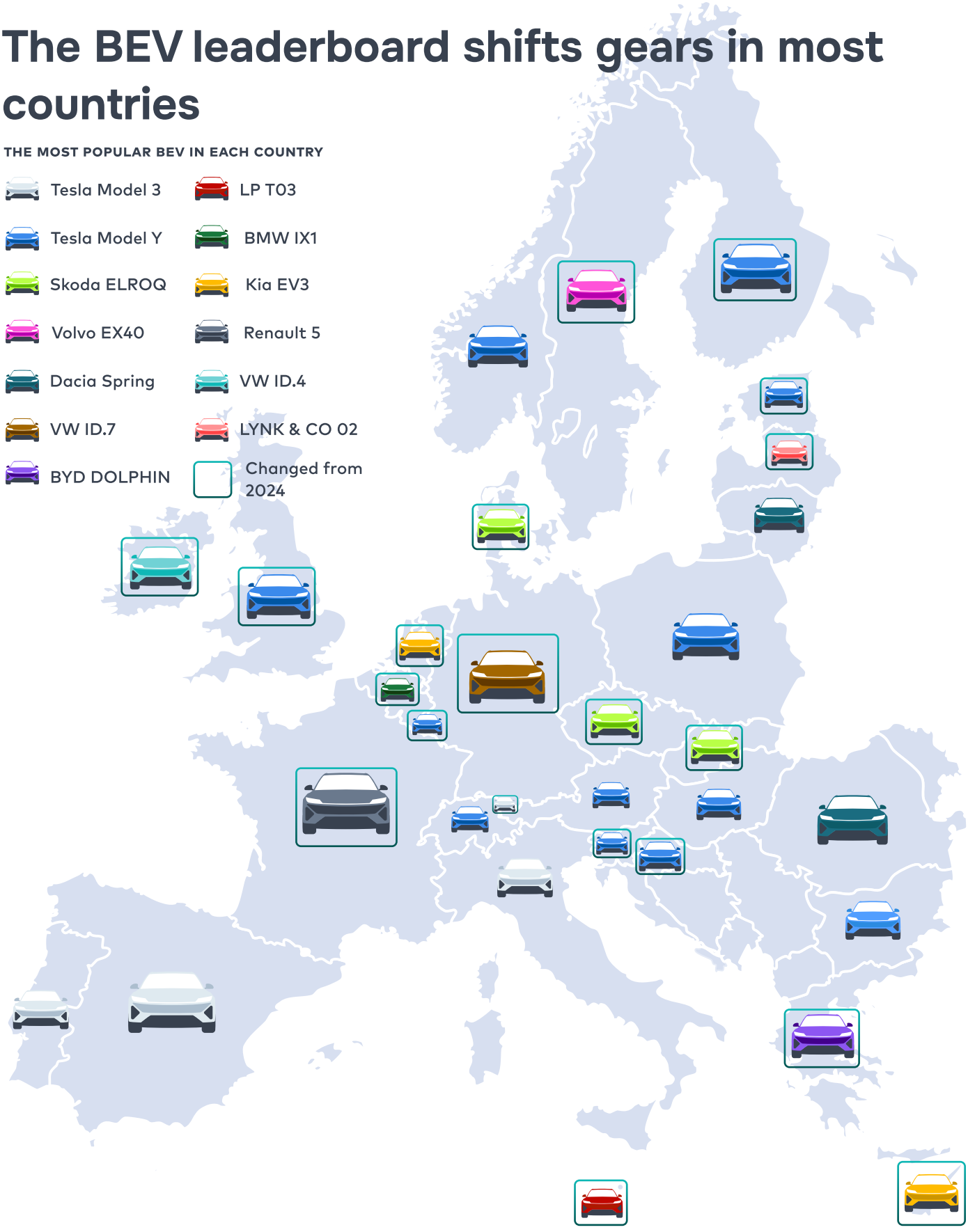
Norway leads in BEVs as a share of the total fleet and as a share of new registrations



There is generally a correlation between the countries with the highest share of battery electric vehicles in the total passenger vehicle fleet and in new vehicle registrations. Once again, Norway and Denmark are clearly ahead across both metrics. While the Netherlands ranks third in BEVs by share of new registrations, Iceland has the third-highest share of BEVs in its total fleet.

Generally, the Nordics and the Benelux countries rank at the top for both, while Central and Western European countries (DACH and the UK) sit in the middle, and Eastern and Southern European countries have the lowest shares for both.

The BEV leaderboard shifts gears in most countries

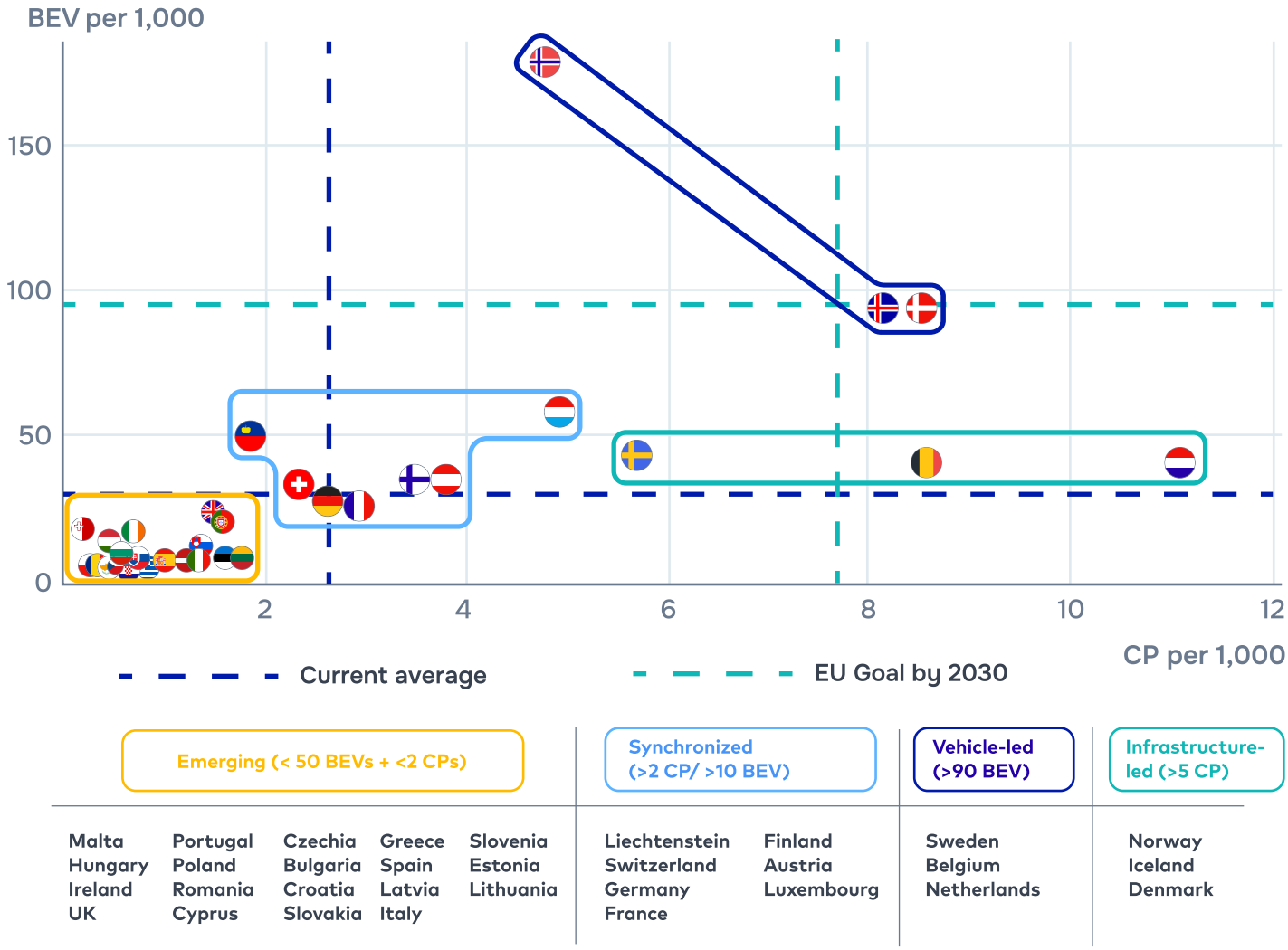


There were 13 models from 11 manufacturers on the map in 2025, compared to nine models from eight manufacturers in 2024, showing the increasing diversification of electric vehicles across the continent and consumers' propensity to look for new brands.

Tesla lost the top spot in three countries: it had the best-selling car in 19 countries in 2024 and 16 in 2025. Four Asian OEMs entered the list for the first time this year, as did Renault. Opel, Peugeot and Audi dropped off the list this year.

Early adopters close the gap on Norway and the Netherlands

BEVs and charge points per 1,000 inhabitants



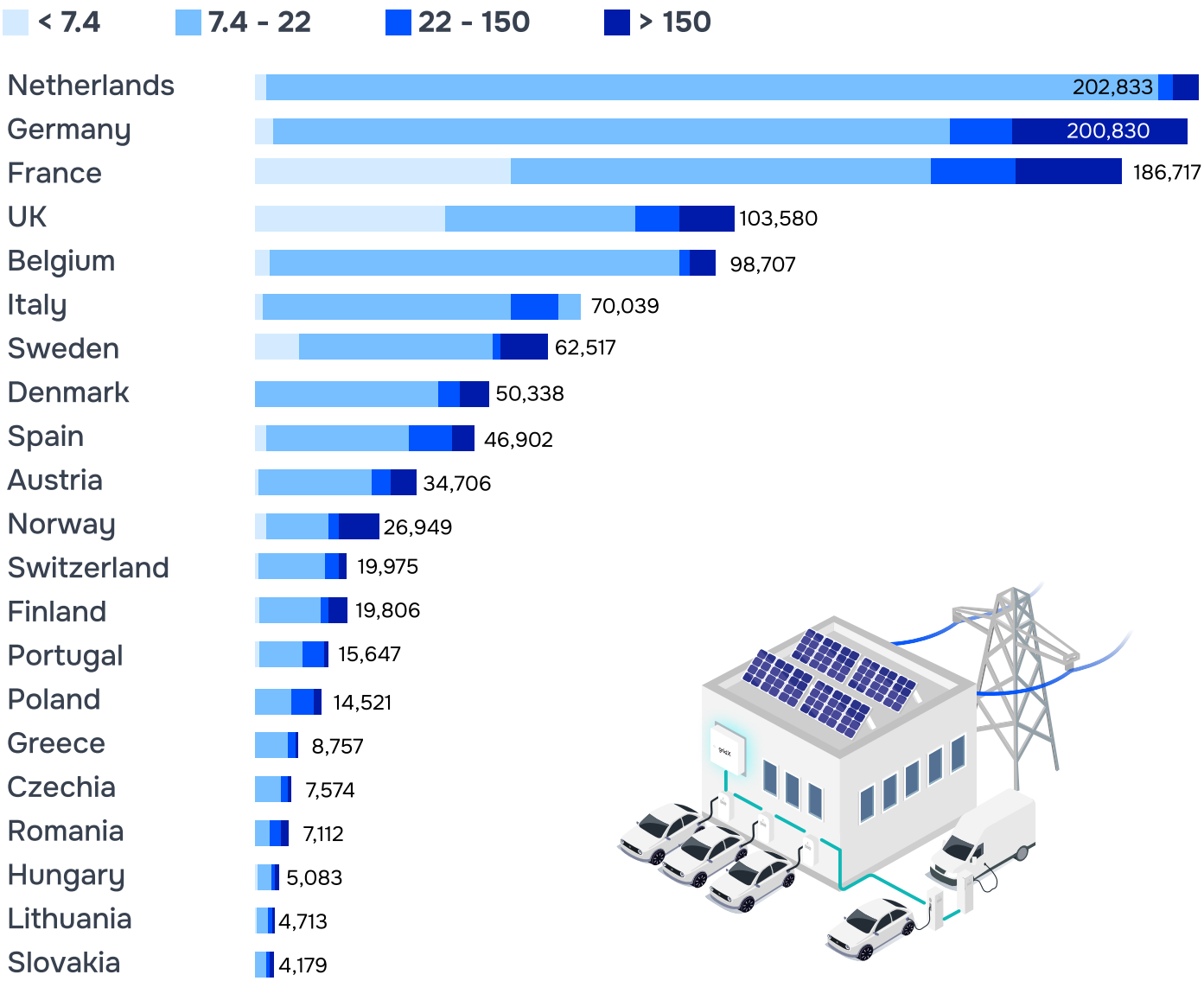
Norway has retained its position as the clear leader in BEVs per capita, while the Netherlands has kept its top spot in charge points per capita. Denmark and Iceland follow with a high number of both EVs and charge points, but a clear tendency towards vehicle-led growth. Belgium and Sweden follow the Netherlands in strong infrastructure growth.

Luxembourg, DACH, Finland and France all have relatively synchronized growth, showing on or just above average numbers of BEVs and charge points per capita. Germany effectively represents the current European average, sitting at 28 BEVs and 2.6 charge points per 1,000 inhabitants.

The UK and Portugal stand out as the leaders of the 'emerging' category, although Lithuania and Estonia top them when it comes to charge points per capita.

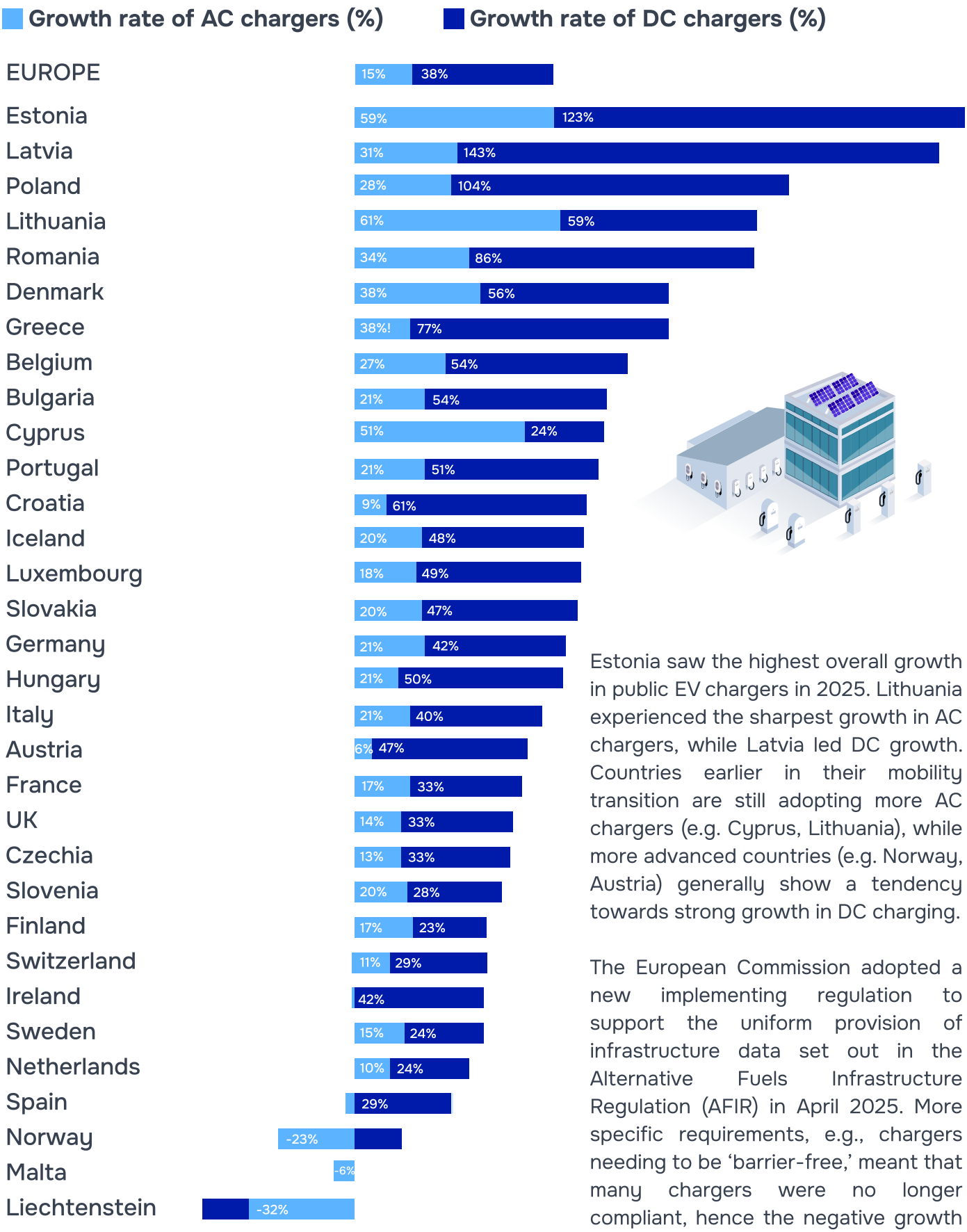
The European average remains far from the EU's 2030 goals of 3.5 million charge points and roughly 43 million BEVs on the road. Denmark's current figures represent where the EU average needs to be in just four years – a major leap for the synchronized group and an even larger feat for emerging countries. The leaders are currently making up for the majority's slow uptake, showing that emerging nations still have a long way to go to ensure Europe reaches its goals.

The Netherlands has the most chargers; Germany leads in ultra-fast charging



Germany has closed the gap with the Netherlands in terms of the absolute number of public EV chargers, with the latter having only 2,000 more by the end of 2025. The ranking has remained mostly consistent compared to last year, aside from Denmark overtaking Spain, Ireland dropping a few places and Lithuania moving up. France and the UK still stand out for their high share of slow chargers. Germany (38,138), France (22,858) and the UK (12,246) have the highest number of ultra-fast chargers above 150 kW.

DC growth far surpasses AC growth

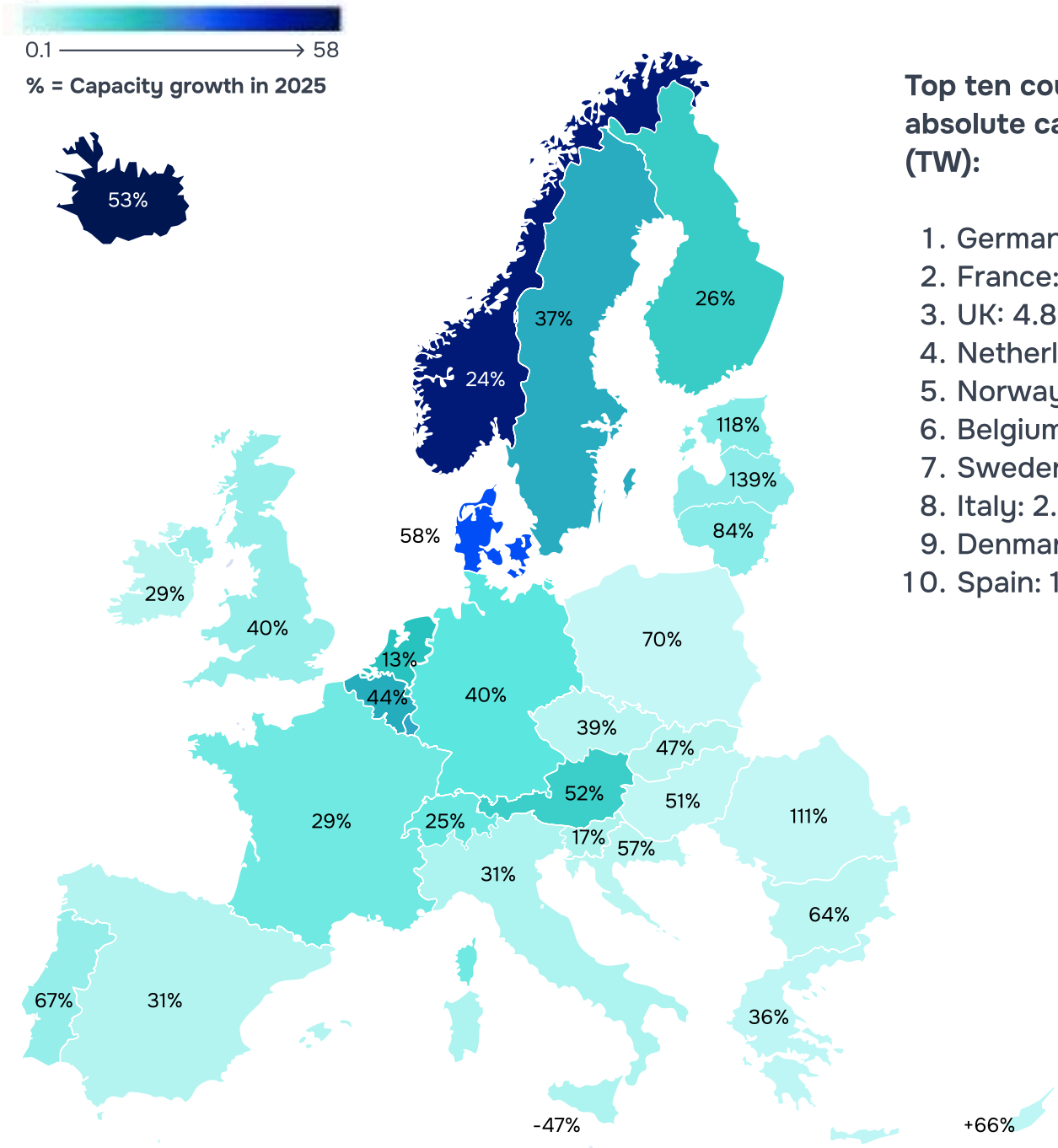


Estonia saw the highest overall growth in public EV chargers in 2025. Lithuania experienced the sharpest growth in AC chargers, while Latvia led DC growth. Countries earlier in their mobility transition are still adopting more AC chargers (e.g. Cyprus, Lithuania), while more advanced countries (e.g. Norway, Austria) generally show a tendency towards strong growth in DC charging.

The European Commission adopted a new implementing regulation to support the uniform provision of infrastructure data set out in the Alternative Fuels Infrastructure Regulation (AFIR) in April 2025. More specific requirements, e.g., chargers needing to be 'barrier-free,' meant that many chargers were no longer compliant, hence the negative growth of AC chargers in numerous countries (Spain, Norway, Liechtenstein).

The Nordics remain capacity kings

Charging capacity (kW) per 100 inhabitants



Top ten countries in absolute capacity (TW):

1. Germany: 9.9
2. France: 6.7
3. UK: 4.8
4. Netherlands: 3.8
5. Norway: 3.0
6. Belgium: 2.9
7. Sweden: 2.6
8. Italy: 2.6
9. Denmark: 2.2
10. Spain: 1.8

While Germany comfortably tops the list for overall charging capacity, when accounting for population, the Nordics once again take a clear lead. Iceland (58 kW per 100 inhabitants) and Norway (53) hold a strong lead, followed by Denmark (36), then Luxembourg, Sweden and Belgium, all at around 25 kW of charging capacity per 100 inhabitants.

Growth in charging capacity in 2025 paints a different picture. Here, the Baltics and Eastern Europe lead the way: Latvia (+139%), Estonia (+118%), Romania (+111%), Lithuania (+84%) and Poland (+70%). The Netherlands ranked third lowest, surprisingly, with a growth of just 13%.

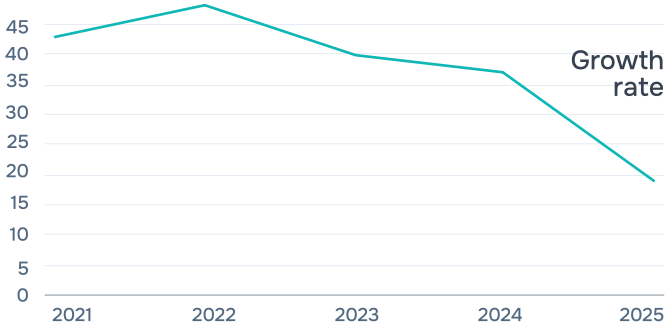
Five-fold growth in the last five years

Overall, the number of public charge points in Europe increased from 251,356 at the end of 2020 to over 1.2 million at the end of 2025, a nearly five-fold growth. The strongest growth was experienced in 2022, followed by 2021. As adoption increases, the rate of growth is plateauing, a natural phenomenon as electric vehicle charging reaches mass adoption. However, much growth is still needed to meet targets, so we cannot get complacent.

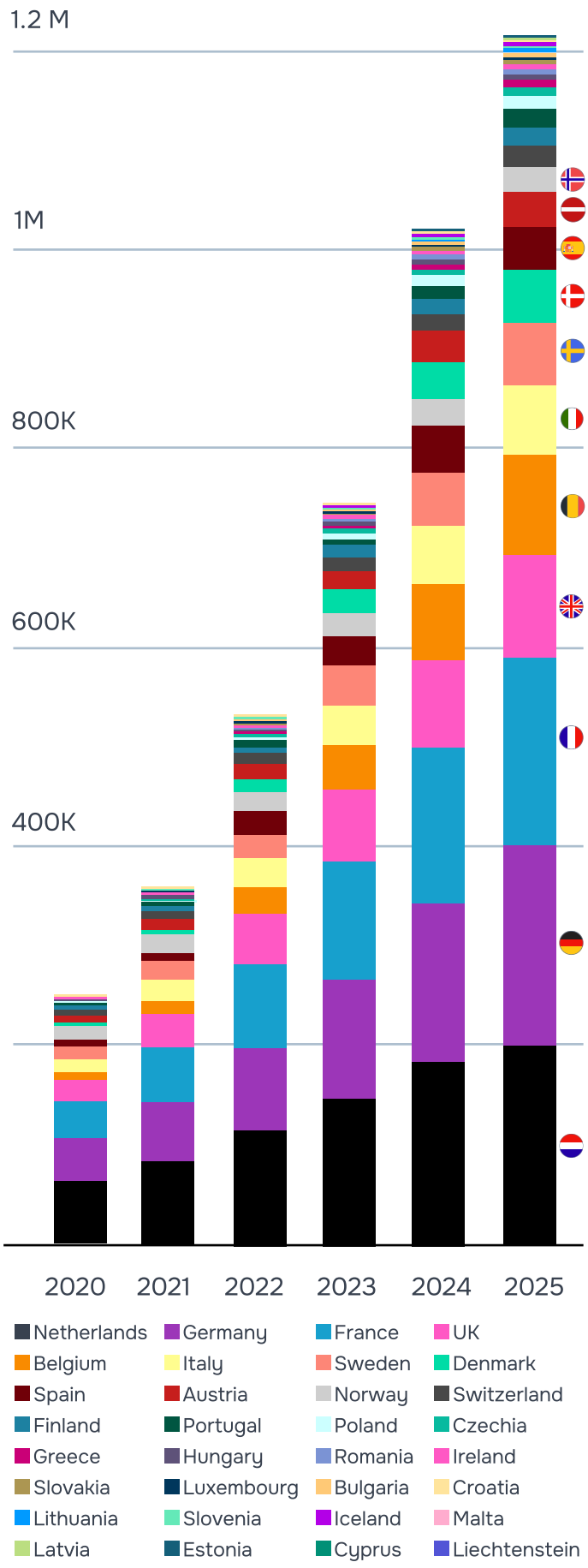
Denmark has really accelerated its adoption of public charge points over the past five years compared to other countries (+1,319%) – it rose from having the 13th highest number in 2020 (3,547 charge points) to the eighth highest in 2025 (50,338), overtaking Norway, Spain, Austria, Switzerland and Finland. Belgium also experienced high relative growth (+1,133%), jumping from the eighth spot (8,003 chargers) to the fourth (98,707). Austria and Norway were clearly earlier adopters of public charge points, having both dropped several places over the years (Norway from sixth to 11th and Austria from eighth to tenth).

The top four countries – the Netherlands, Germany, France and the UK – have all experienced growth of over 200% in the last five years. The Netherlands, which started from a stronger base, had the lowest growth at 215%, while the other three were all notably higher: the UK at 360%, Germany at 387% and France the highest at 398%. When just looking at growth in 2025, Germany had by far the highest growth of the top four with a 26% increase in chargers.

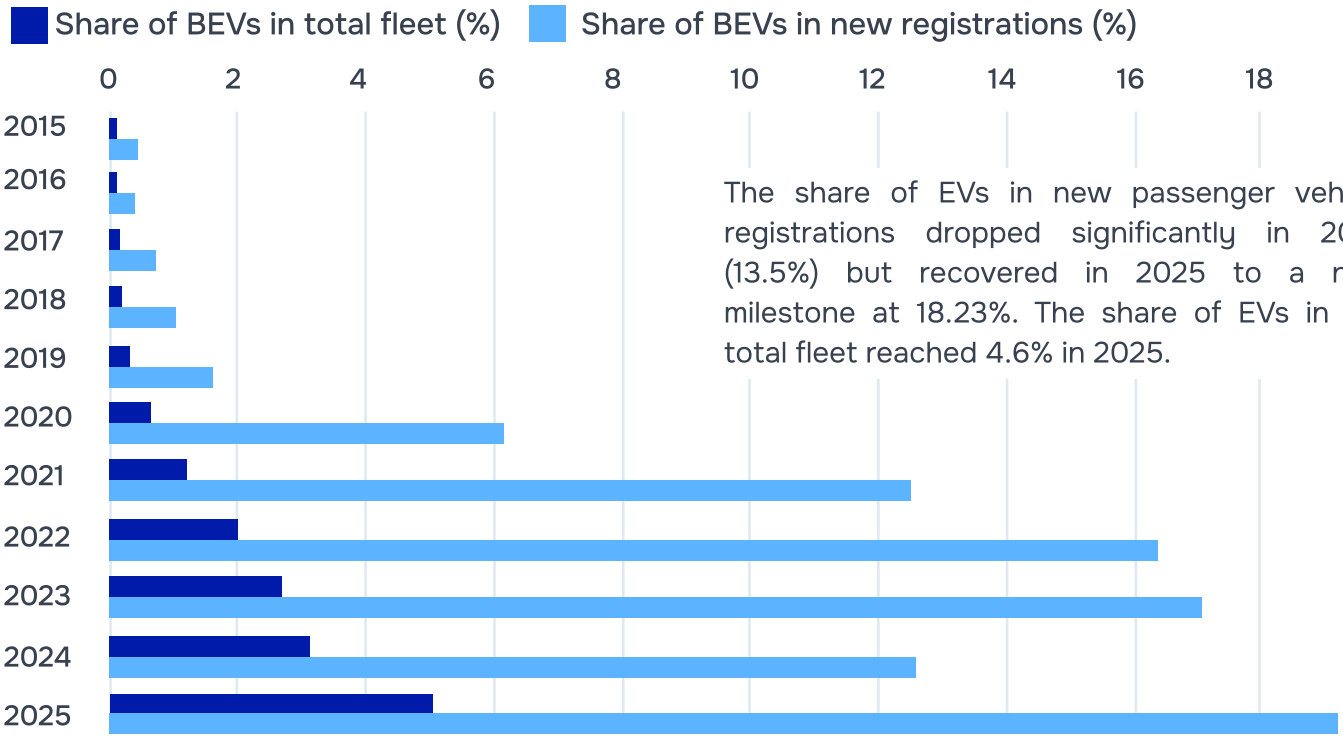
Growth rate in charge points (%)



Charge point growth over time, by country

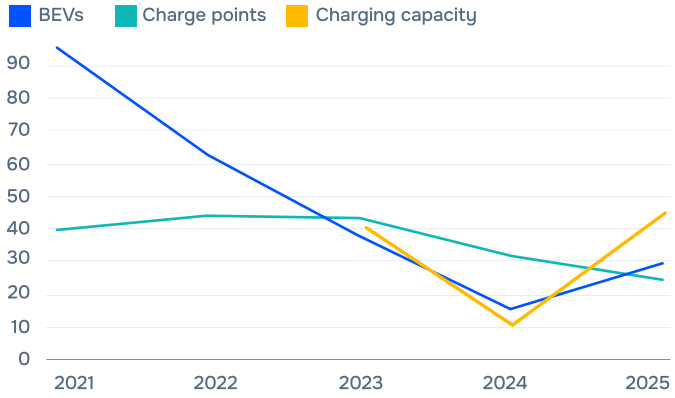


Germany



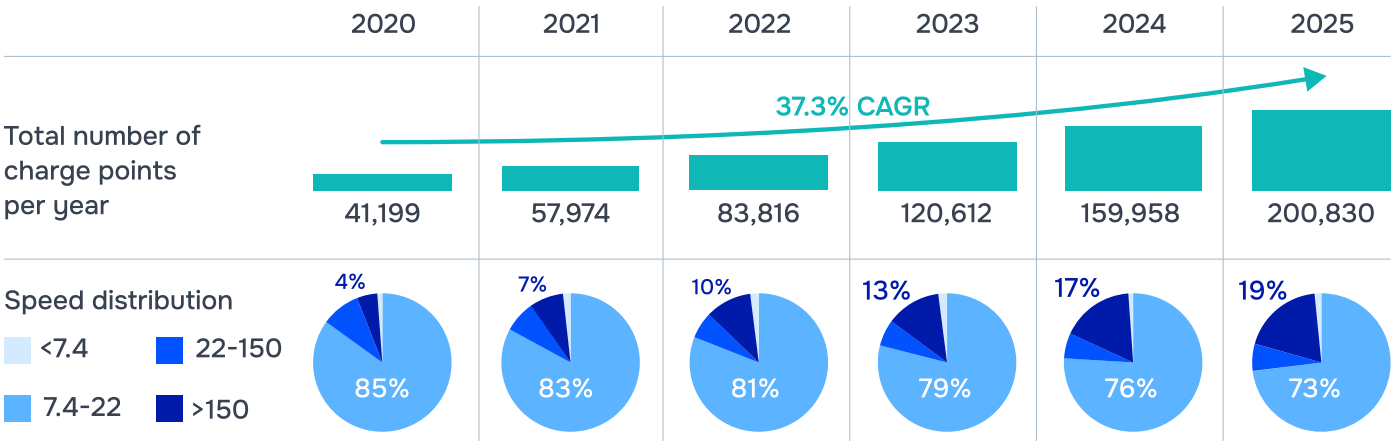
The share of EVs in new passenger vehicle registrations dropped significantly in 2024 (13.5%) but recovered in 2025 to a new milestone at 18.23%. The share of EVs in the total fleet reached 4.6% in 2025.

Year-on-year growth (%)



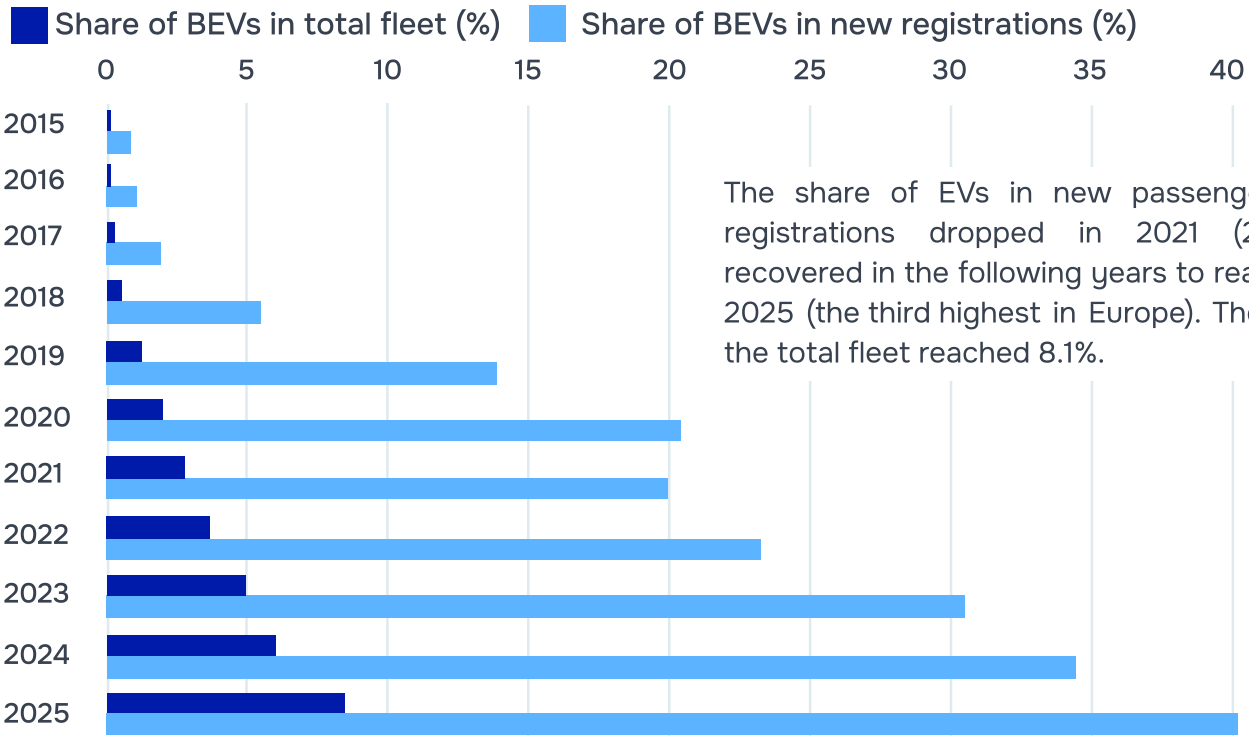
The year-over-year growth of BEVs also dropped in 2024 (17%) but recovered to 40% in 2025.

The growth rate of charge points declined slightly over the last two years; however, the increase in charging capacity (40%) exceeded the increase in charge points (26%), highlighting a greater focus on high-power charging.



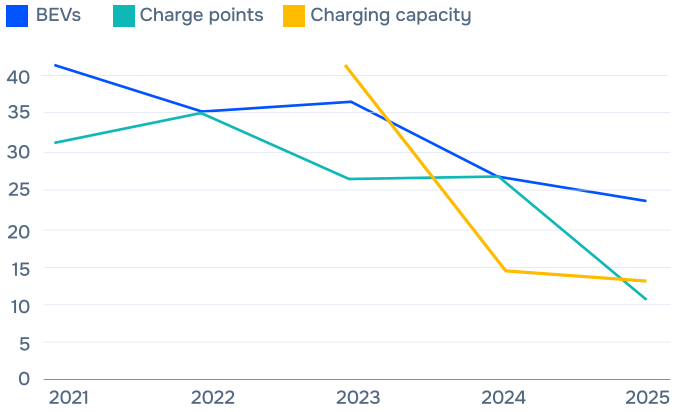
The share of ultra-fast chargers has gradually increased from 4% in 2020 to 19% in 2025, while the share of average chargers dropped from 85% to 73% – a clear trend towards faster charging.

Netherlands



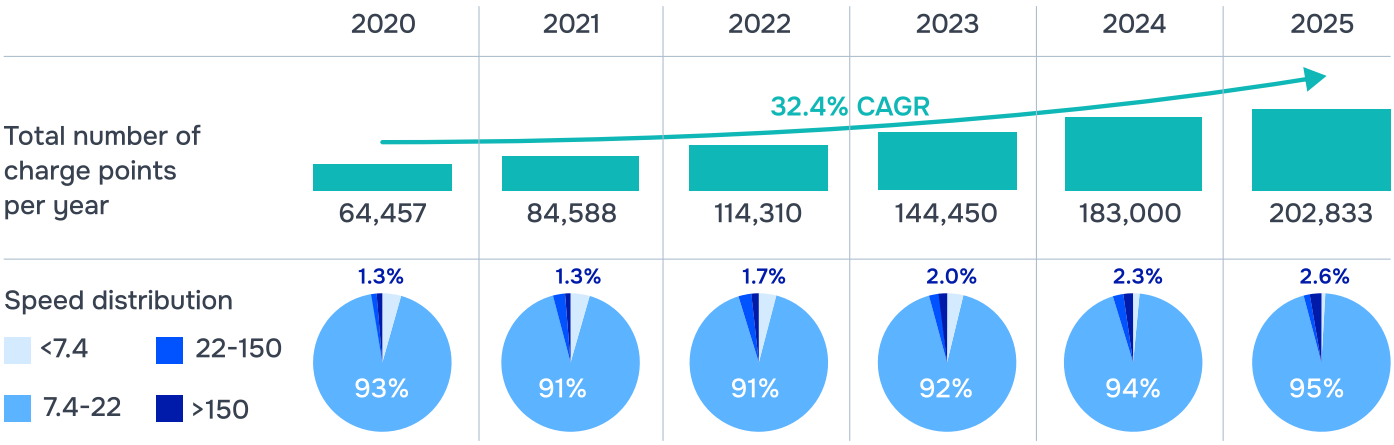
The share of EVs in new passenger vehicle registrations dropped in 2021 (20%) but recovered in the following years to reach 42% in 2025 (the third highest in Europe). The share of the total fleet reached 8.1%.

Year-on-year growth (%)



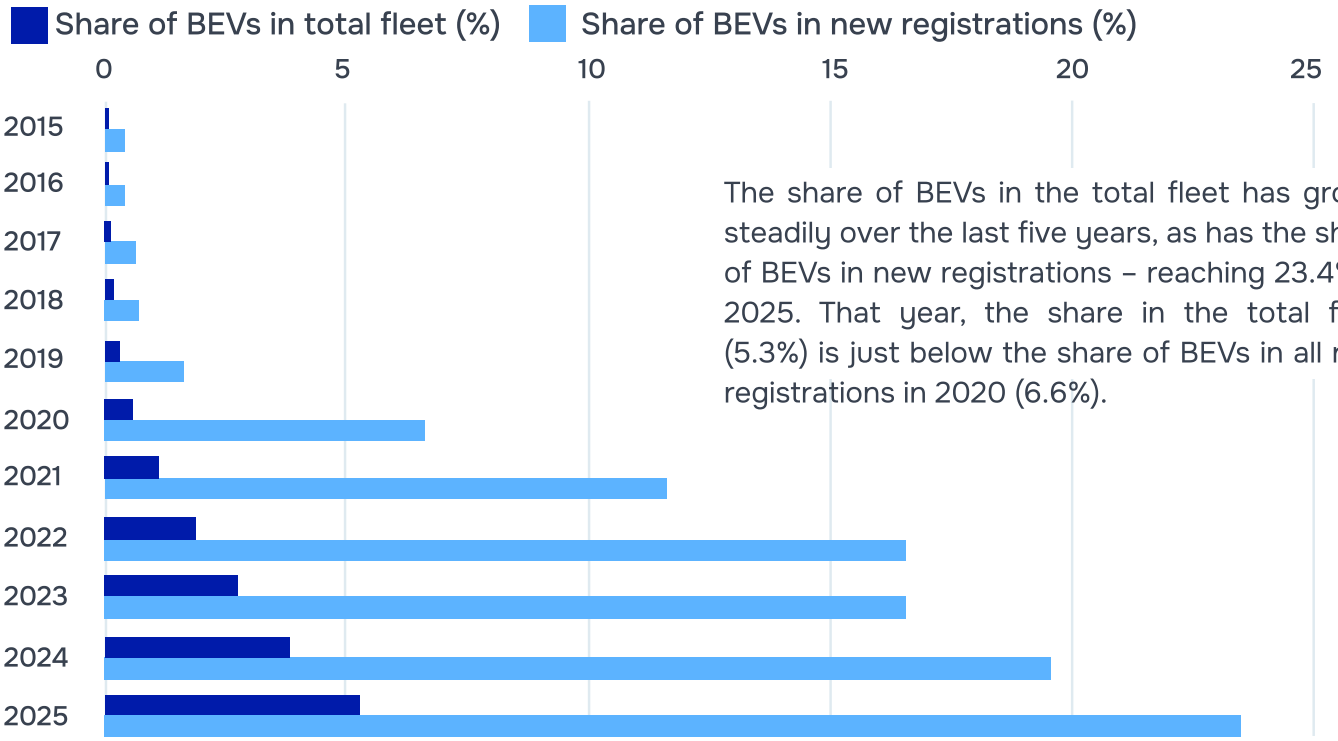
The Netherlands experienced an early growth spurt in previous years and is plateauing as grid congestion stems growth. The rate of growth for BEVs, charge points and charging capacity all dropped in the last few years.

To reach its goal of 1.8 million charge points (roughly 400,000 of which should be public), charger adoption must double in the next four years.



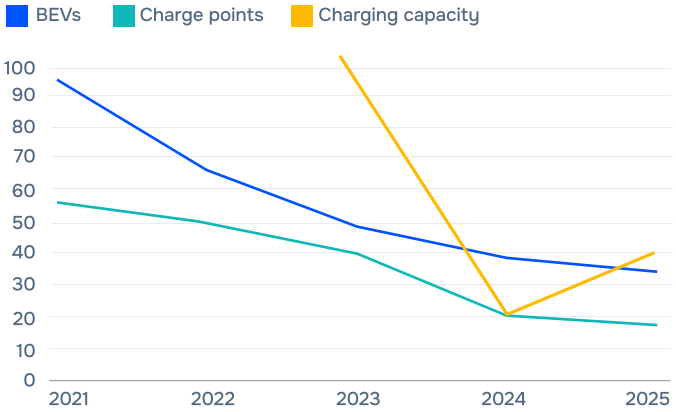
Even though the share of mid-speed chargers increased in the last five years, the share of high-speed chargers doubled and the share of slow chargers dropped from 4.4% to 0.9%.

UK



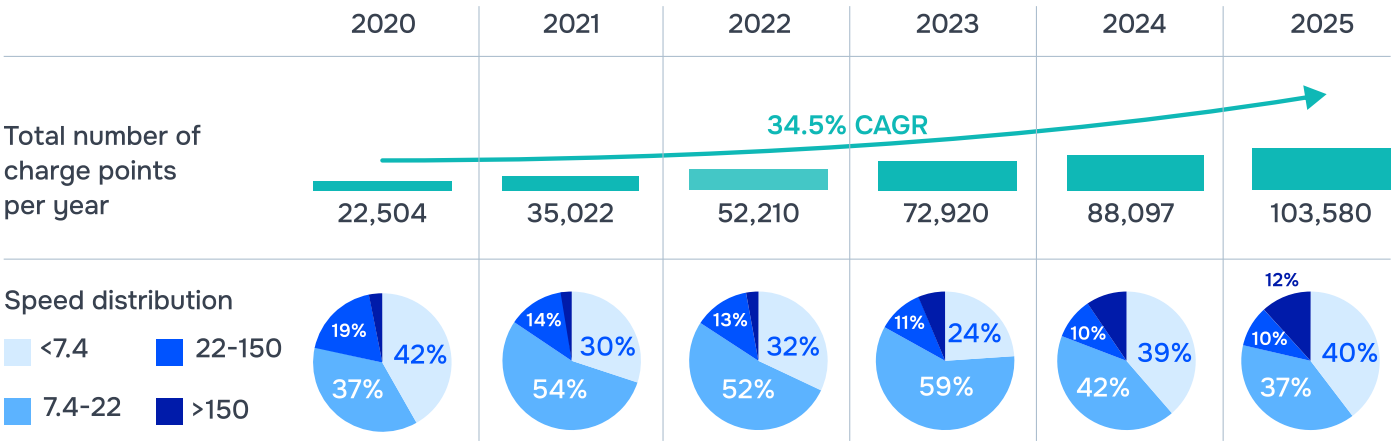
The share of BEVs in the total fleet has grown steadily over the last five years, as has the share of BEVs in new registrations – reaching 23.4% in 2025. That year, the share in the total fleet (5.3%) is just below the share of BEVs in all new registrations in 2020 (6.6%).

Year-on-year growth (%)



The growth rate of BEVs and CPs declined gradually over the last few years; however, charging capacity saw a renewed surge in 2025, climbing back to 40%. This highlights a clear pivot toward high-power charging.

This transition is reinforced by the increasing share of ultra-fast chargers shown below.



The share of ultra-fast chargers steadily grew from 3% to 12% over the last five years in the UK. It also has an abnormally high share of slow chargers, as the government encouraged the adoption of lamp-post chargers to accommodate UK-specific terraced-house setups.

E-mobility market challenges in 2025

Despite crossing the milestone of one million public chargers in 2025, both public charge point operators and fleet operators revealed their second-order challenges and were forced to adapt.

Public CPOs: Low utilization and margin pressure force exits and alliances

Distressed exits signal structural margin pressure:

- The UK's Pod Point was acquired by EDF for £10.6M in June 2025, a fraction of prior valuations.
- Renault scaled back its planned European public network from 650 to 200 stations.
- Italy redirected €597M originally earmarked for charging infrastructure to EV purchase subsidies, illustrating the fragility of CPO revenue assumptions when policy changes direction.
- In Belgium, Stroohm and Pluginvest merged to form Virya Energy; in the Netherlands, Qwello acquired Park&Charge, bringing together 15,000+ charge points across 300 municipalities.

Network alliances compensate for scale gaps

- In April, Atlante, Electra, Fastned and IONITY formed the Spark Alliance – pooling 1,700+ stations across 25 countries under a shared roaming framework. Network scale and interoperability are becoming prerequisites for commercial viability in the public segment.

Capital concentrates at the top, but growth stays expensive

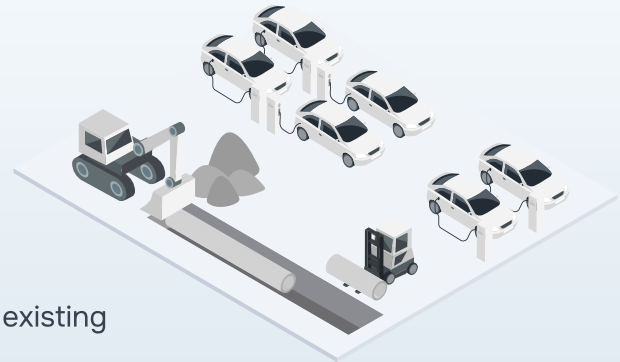
- IONITY raised €600M targeting 13,000 ultra-fast sites by 2030.
- Electra secured €433M in green financing.
- Fastned crossed €100M in annualised revenue (2024: €86M, +43% YoY) and raised ~€110M in bonds across 2025.

Sources: 7-15

The market continues to grow, but capital intensity is high and returns are concentrated among a shrinking number of operators with clear corridor strategies.

Operational challenges for CPOs: High upfront investment meets revenue realization

- High grid connection capacities required and expansion dependent on grid approvals
- Low average utilization (~10%)
- Significant fixed infrastructure costs
- Slower-than-forecasted EV adoption
- Strong investor and profitability pressure



Future viability depends on maximizing the value of existing grid capacity while controlling operational costs.

Fleet operators transition from ad-hoc pilots to scalable multi-year infrastructure commitments

Industrial scaling truly began in 2025, meaning fleet operators moved from "does this work?" to "how do we embed it in operations at scale?"

Truck charging goes from pilot to continental backbone

- Milence secured €111M in EU (AFIF) funding to deploy 71 charging hubs across ten European countries by 2027. By November 2025, 30 hubs were live across eight countries.
- Shell launched an integrated depot-plus-public charging service for heavy-duty fleet operators, targeting 25% cost reduction vs. traditional approaches.

Depot charging becomes a capital decision

- Norfolk County Council committed £13.8M to 24 electric double-deckers with full depot upgrades.
- Belgian transit operator De Lijn issued a €24.2M tender for 600–900 depot chargers.
- Munich Airport completed a €23.8M e-bus depot (37 chargers, expanding to 72 in 2026).
- SNCF contracted Virta & Eiffage to manage 5,000 EV chargers over six years, embedding charging as a long-term operational component rather than a trial arrangement.

Smart solutions (load balancing/cost allocation/grid compliance) replace plug-and-hope

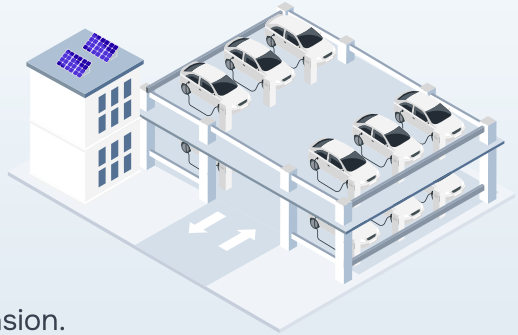
- E.ON won a 7,000-charger contract for German federal fleet facilities.
- The UK Depot Charging Scheme (closed November 2025), covering up to 75% of installation costs, saw strong uptake.
- Virta's acquisition of Northe (August 2025) and B2B traction at AMPECO and GreenFlux confirm fleet charging management systems as an emerging dedicated sub-segment.

Sources: 16-22

Continent-wide charging networks, high-capex depot investments and advanced energy management have become core to cost control, reliability and long-term competitiveness for operators and the B2B resellers, who sell to logistics companies and fleet operators.

Operational challenges for B2B resellers: Growing charging demand meets fixed grid capacity and rising costs

- Increasing total kWh demand
- Higher charging peaks and peak power charges
- Limited grid connection point (GCP) capacity
- Lengthy DSO upgrade processes
- Electricity price volatility



Without intelligent energy management, operators risk escalating operating expenses and constrained site expansion.

XENON: From deployment to intelligent operation

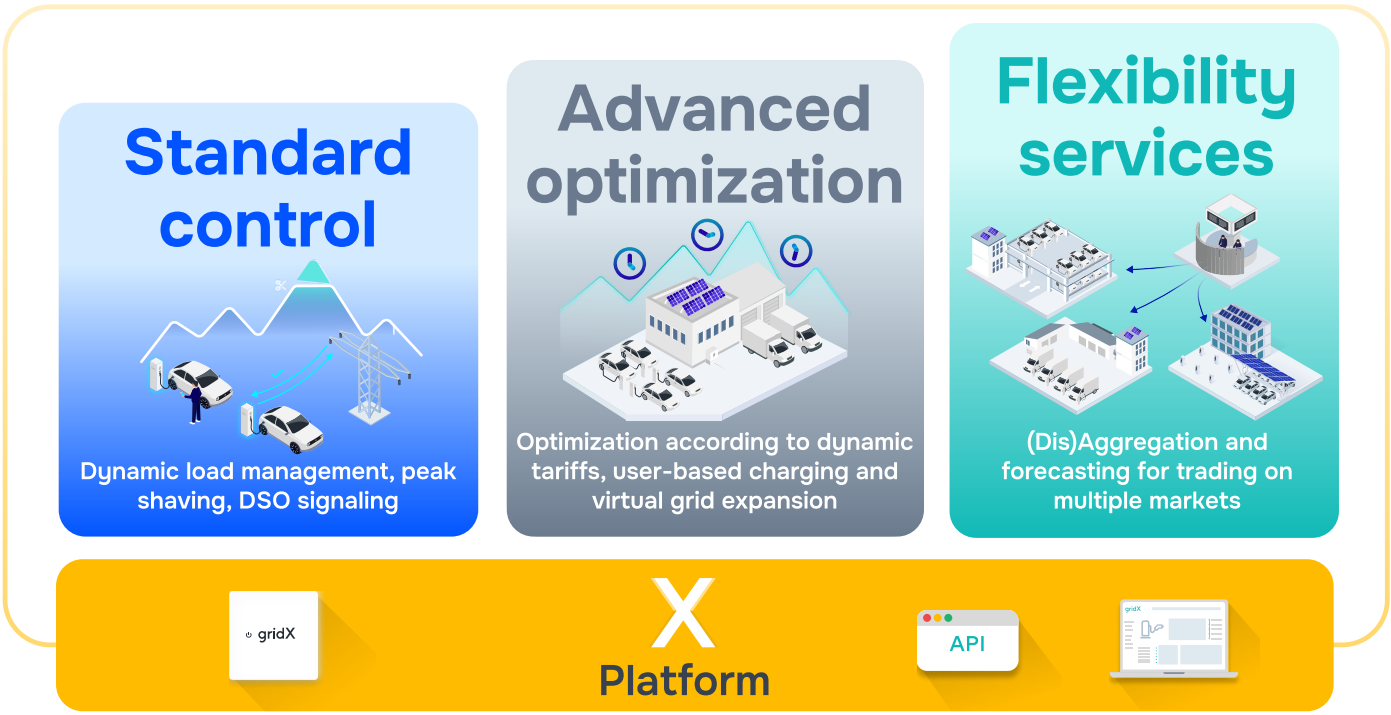
The current landscape demonstrates that as e-mobility enters mass usage, CPOs are turning to all available levers to efficiently operate their assets within grid and market constraints. EMS, specifically gridX's XENON, has evolved into an integral strategic asset that empowers commercial operators to:

- Stabilize cost exposure
- Navigate regulatory requirements
- Scale charging networks sustainably
- Grow margins and contribute to the bottom line

> "Allego is making sure that energy is balanced, locally and across energy markets. To ensure scalable and reliable infrastructure, we work together with gridX for local physical load balancing using the latest communication protocols and integration with grid operators to ensure the optimal performance of the overall electricity grids. We balance for the perfect customer experience."

Guillaume Goijen
Director of Charging Technology
Allego

XENON for electric vehicle charging infrastructure (EVCI)

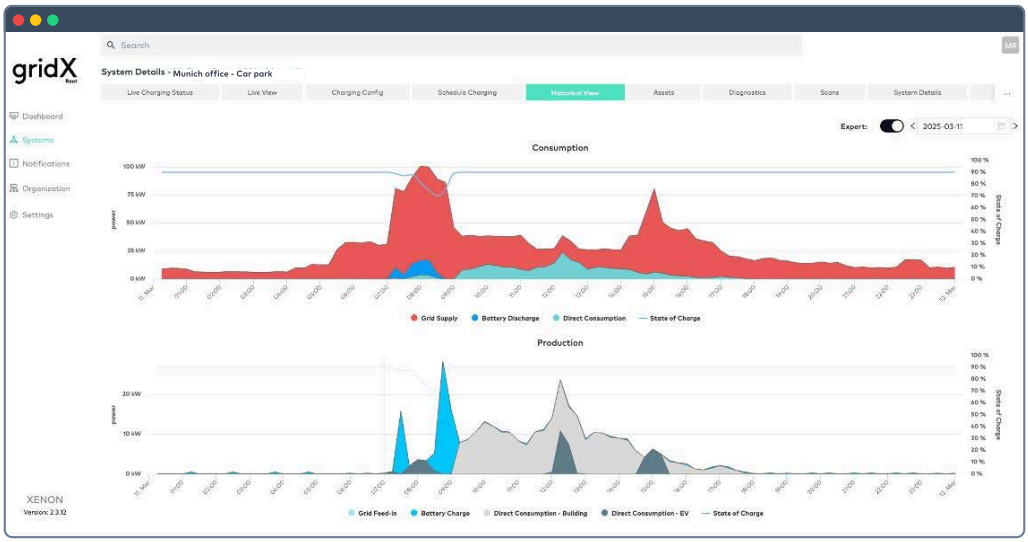


gridX's energy management system, XENON, provides a foundational platform with the gridBox, API and dashboard as standard and three modular layers or feature sets specific to your use case.

XENON dashboard:
The command center for unified monitoring

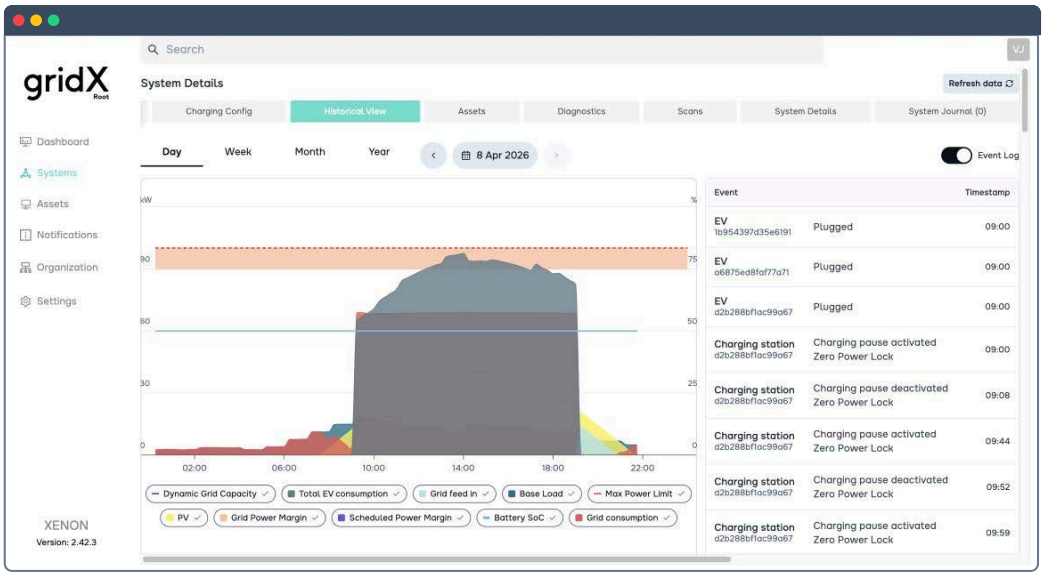
Everything in one place. The XENON dashboard significantly reduces downtime and operational disruptions through 24/7 monitoring across all sites and proactive alerts, allowing CPOs and B2B resellers to identify and resolve issues before they impact their business. Its comprehensive set of features includes:

- Real-time remote monitoring and control of charge points
- Centralized asset and system management
- Intelligent scheduling of charging sessions to optimize performance, efficiency and cost savings
- Flexible API integration to build on top



The XENON dashboard is evolving into an advanced analytics hub, delivering strategic insights and enabling proactive, data-driven decision-making. Operators will be able to:

- Analyze charging utilization trends, historical performance data and predictive models
- Evaluate ROI of assets, such as batteries or new chargers based on current usage trends
- Optimize extensions: upgrade grid connections only when bottlenecks threaten operations



Standard control:
Maximize the value of existing grid capacity

Across commercial charging segments, grid connection capacity is the most critical limiting factor. Whether at workplace locations or high-power charging hubs, the grid connection point (GCP) defines how much energy can be delivered at any given time. Exceeding contracted limits leads to peak penalties, while upgrading capacity often requires long DSO processes and significant capital expenditure. XENON's standard control layer transforms grid capacity from a fixed constraint into an actively managed economic asset.

Protect the fuse, dynamically manage loads and shave peaks

The local gateway – the gridBox – continuously monitors total site consumption and dynamically allocates available power across all connected charge points as standard. This includes:

- Dynamic Load Management (DLM) allows operators to install more (eight times as many) charge points within existing GCP limits and realize €50,000 in upfront savings per site, depending on local grid conditions and expansion requirements.
- Intelligent peak shaving lowers costs by around €10,000 per year by only curtailing 1% of charging activity.
- Fuse protection at every level (multi-fuse architecture) guarantees operational resilience.

Simplify regulatory compliance across regions and DSOs

Navigating increasingly complex and varied regulatory landscapes presents substantial challenges for operators expanding into new markets. XENON automates critical compliance tasks such as integrating DSO signals and ensuring operators seamlessly fulfill mandatory regulations, like Germany's §14a EnWG and the UK's G100. This ensures charging sites are immediately compliant, significantly reducing the time required to launch new locations – from months down to weeks – while eliminating costly penalties and operational delays.

- **Automated DSO signaling:** XENON dynamically processes DSO power signals, adjusting the site's grid connection limits automatically.
- **Rapid site deployment:** Accelerates compliance-related processes, drastically shortening lead times and enabling quicker market entry.
- **Compliance across markets:** Ensures effortless adherence to technical grid connection requirements, eliminating compliance barriers for new site openings.

Fast charging operator, Fastned, used XENON to open six new fast charging sites that were grid compliant across five different DSOs in a matter of months.

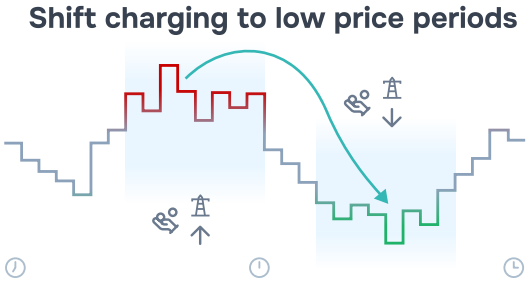
FASTNED

Advanced optimization: Turn energy demand into a competitive advantage

XENON's intelligent energy management enables operators to reduce operating expenses and unlock additional revenue potential. By aligning charging behavior with fluctuating electricity prices and grid fees, XENON's dynamic tariff optimization significantly cuts energy costs.

Dynamic tariff optimization

Automatically shifts charging to low-cost electricity periods, saving hundreds or thousands of euros annually per site, depending on size and local requirements. XENON's dynamic tariff optimization feature uses day-ahead market prices and forecasted charging needs to plan ahead. Each EV is guaranteed its minimum energy requirement – configured at a site level – and this energy is delivered during the cheapest available hours. Once the minimum requirement is reached, additional charging only continues if prices remain favorable.



User-based prioritization

The gridX user-based prioritization addresses operators' emerging need to differentiate users for charging priority. The priority is determined in the charge point management system's backend and forwarded to the gridX platform using an open API (with high backend compatibility). The core functionality opens vast opportunities to satisfy the increasing expectations of EV charging. Operators and drivers expect seamless operational integration (depots) and reliable, predictable charging results in workplace charging or semi-public parking. gridX offers a novel solution to deliver these, provide excellent customer experience and positive business outcomes.

Virtual grid expansion through battery integration

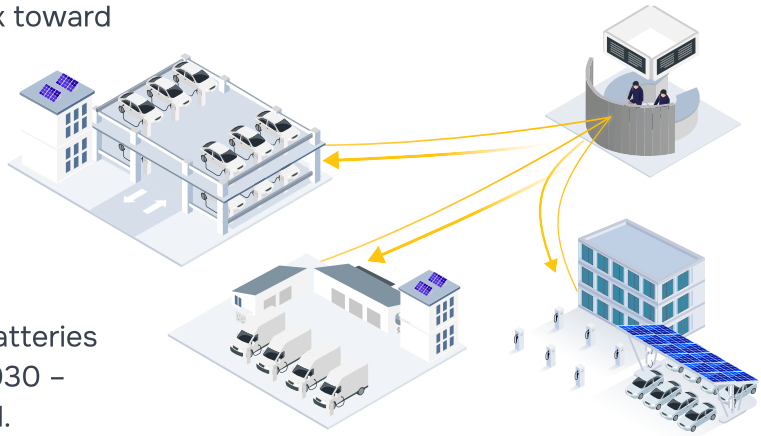
Where battery storage is integrated, XENON enables temporary expansion of usable charging capacity by discharging stored energy during high-demand periods. This allows operators to:

- Deploy chargers at locations previously considered unsuitable
- Increase effective charging capacity without raising contracted GCP
- Absorb short-term peak events without exceeding limits

The economic effect is two-fold: higher infrastructure utilization and deferred grid upgrade investments.

Flexibility services: Open up new revenue generation streams

To monetize the flexible capacity of their energy assets, CPOs must move beyond basic grid feedback toward the sophisticated optimization of timed consumption across diverse market conditions. Only then can electric cars and chargers be transformed from burdens into revenue-generating and grid-supporting assets.

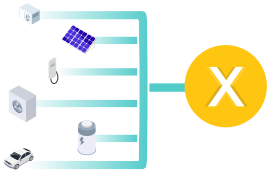


An EY and Eurelectric report found that EV batteries could offer a capacity of up to 114 TWh by 2030 – flexibility that still largely remains unexploited.

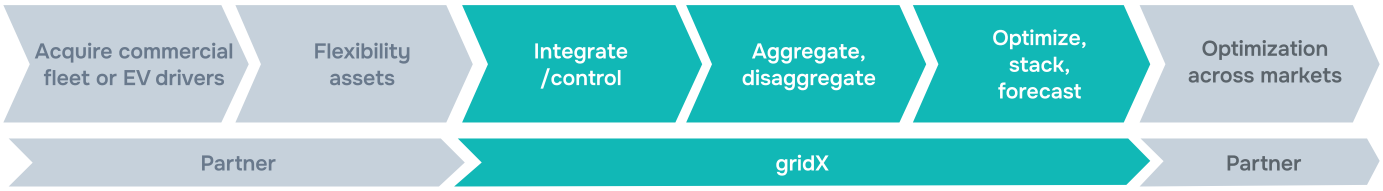
This is equivalent to 4% of Europe's annual power supply, enough to power 30 million homes across the continent annually. This share could rise to 10% of Europe's overall power needs by 2040.

How can this be tapped into? By forecasting charging and consumption demand, aggregating or pooling the flexibility of idle, plugged-in electric vehicle battery capacity and standalone battery capacity, and making this flexibility available for trading on various energy markets. At the same time, XENON ensures that specific local operational requirements are always met when trading occurs.

How does gridX make this possible?



With XENON Flex, gridX acts as an aggregator and provides grid balancing services and congestion management, as well as imbalance, day-ahead and intraday optimization for home battery and EV use cases.



Flex is the future that CPOs must start now

"The integration of charging networks into explicit flexibility services allows CPOs to provide essential grid relief, and thus turn a standard service into a sophisticated revenue stream. With the right scale and expertise, gridX is uniquely positioned to lead this evolution. Through data-driven insights and intelligent steering, we ensure your charging network's commercial potential are fully maximized."

Sebestyen Haty
Product Lead, EVCI
gridX

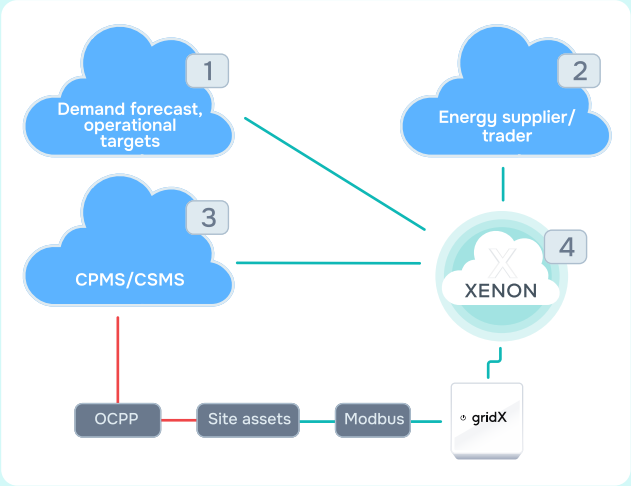
How gridX plans to tap into flex for EVCI

The first essential step in monetizing the flexibility capacity of operators' assets is establishing a robust technical foundation: deploying co-located battery storage, defining clear performance targets and implementing precise demand forecasting with the help of an EMS. gridX plans to use this as the basis to then enable trading of pooled flexibility, primarily on wholesale markets. Here's how:

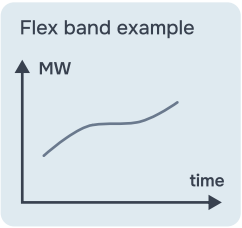
1. Operational targets
Targets (state of charge, departure times, building energy demand) are shared via API.

2. Energy supplier/trader (ideally same party)
Integration with EMS ensures balancing.

3. Backend: The heart of operations
EMS integration enables a complete operational view – including maintenance – and thus accurate flex forecasting.



4. gridX's XENON Flex layer
gridX is uniquely positioned to forecast and aggregate pool flexibility capacity for external trading, then disaggregate and dispatch flexibility based on the traded amount while taking operational requirements into account. gridX has rolled out its flex layer in HEMS. Flex for EVCI is coming soon.



Calculating flexibility bands to ensure operational targets

gridX provides trading desks with flexibility bands that offer tradable capacity (MWh) along a timeline – not just in the moment – to enable cross-market optimization and trading. The band is calculated based on the operators' targets and is updated regularly.

Find your flex: Possible markets, setups and logic

Wholesale markets

- Day-ahead and Intraday (auction/continuous)
- >0.1MW volume
- 15-min delivery periods, trading up to 5 mins before delivery
- More attractive: high plannability, low minimum volume requirements, no complex prequalification hurdles

Balancing markets

- FCR, aFRR, mFRR
- >1MW volume (x10)
- Fast reaction (<30 s), mandated durations (>15-min for energy and >4-hr for capacity)

Battery systems (BESS)

For site enablement and to power charging.

- **Flex logic 1**: Use idle BESS capacity to charge/discharge when traded
- **Flex logic 2:** Use BESS capacity as primary reaction asset and/or minimize impact on charging operational performance

Charging

For charging readiness and driver satisfaction.

- **Flex logic 1:** Optimize charging procurement by shifting consumption via trading
- **Flex logic 2:** Curtail or boost charging within operational performance boundaries based on market signals

Voices from the industry: Flex opportunities

Survey of four of Europe's biggest CPOs: Top answers

Most pressing challenge (chosen by all):
Securing sufficient local grid capacity for new sites

Most important tool to meet goals (rated 4-5 / 5):
Robust platform scalability

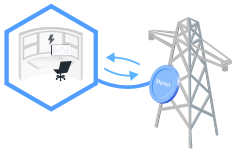
EMS capabilities in order of priority:

- Basic dynamic load management
- Asset compatibility
- Grid signal processing
- Peak shaving (to lower grid fees)
- Dynamic tariff optimization
- Flexibility forecasting & (dis)aggregation
- Flexibility market access (trading)

This aligns perfectly with **gridX's core offering** for electric vehicle charging infrastructure and more **advanced add-ons.**

All operators plan to install: BESS (not all plan to install on-site PV or bi-directional chargers)

Purposes for installing batteries:



Now
Avoiding grid connection upgrade costs and lowering grid fees (Implicit flexibility)

Next
Participating in flexibility markets

CPOs want to scale flex in the next few years

Top objective guiding a flexibility product portfolio: Cost-efficiency and adding revenue sources

When will flexibility become a significant business driver: Within 1–4 years

Biggest barriers in adopting flex: Interoperability challenges and lack of a clear business model

Most complex topic around flex: Forecasting, aggregation and disaggregation

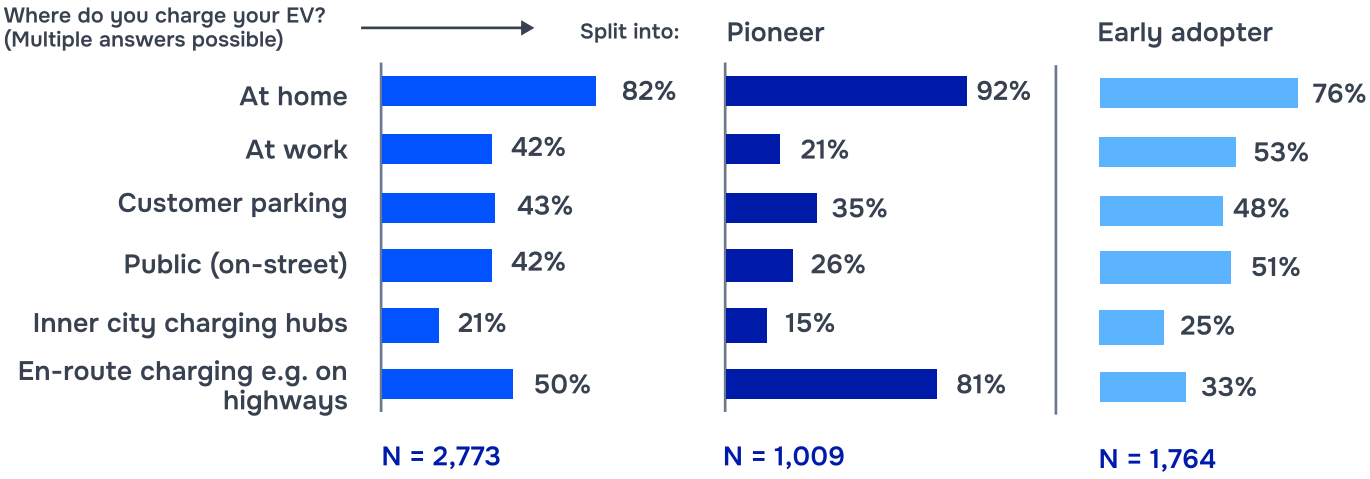
Best way to quickly learn about flex: Learn quickly from pilots

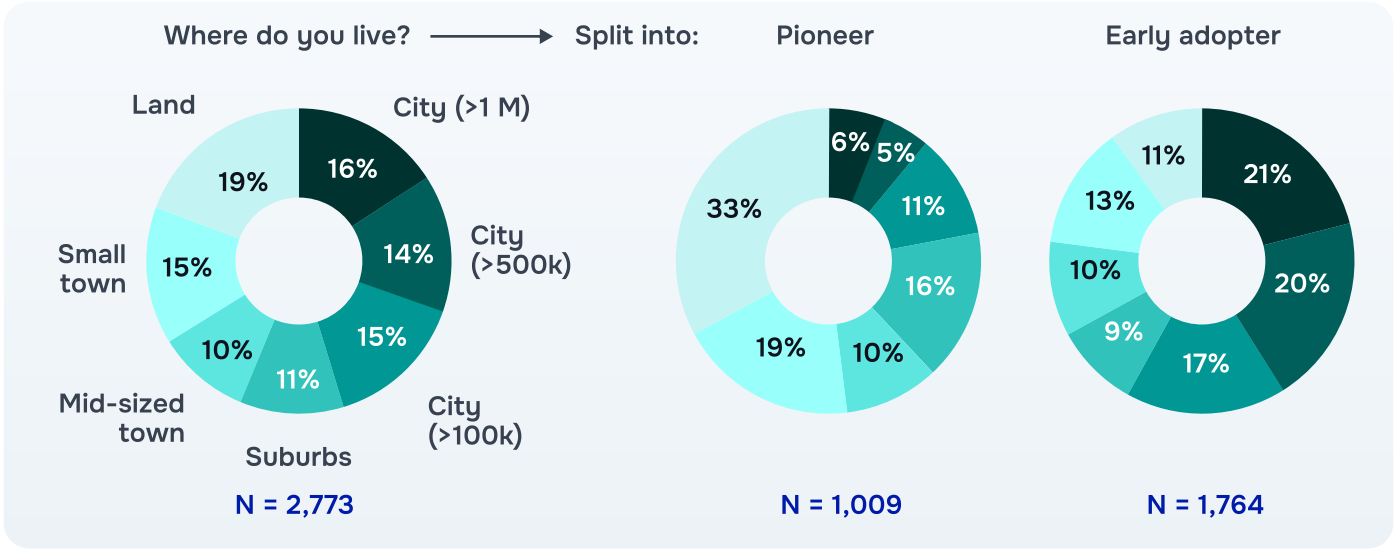
Residential charging in Germany

A charging mix is key to scaling EV adoption

A user survey of almost 3,000 BEV owners across Germany from BDEW shows that home charging is the most favored form of charging, followed by en-route charging. This shows that having a mix of home, work, destination and fast chargers is key to EV adoption.

Pioneers – early EV users who adopted when infrastructure was still limited – are even more likely to charge at home and on highways, while early adopters – those who entered the market as charging networks and vehicle availability expanded – make greater use of other charging locations. 62% of pioneers live rurally or in towns, while 58% of those in the early adoption phase live in cities.





Source: 41

Regulation pushes for smarter, more flexible charging

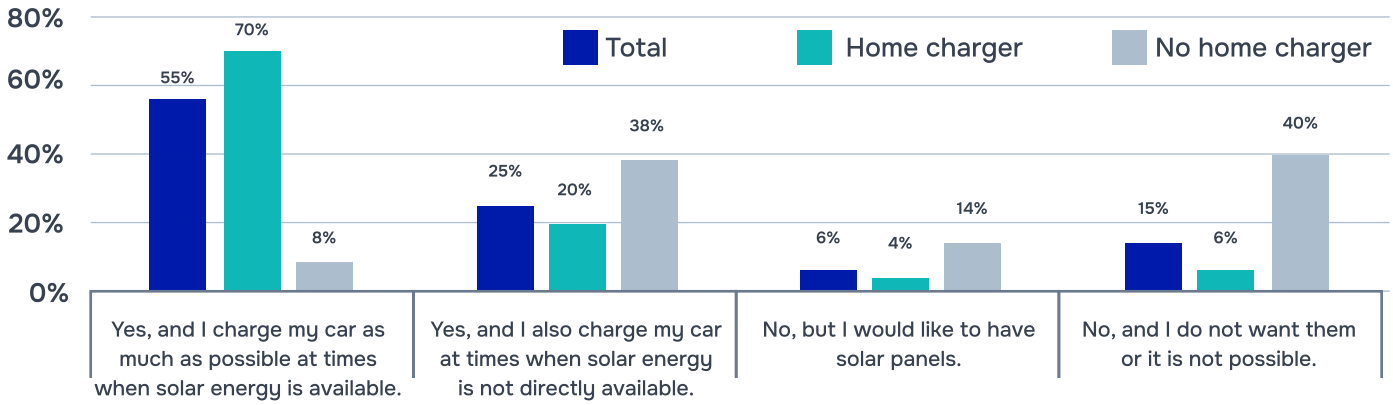
Policies such as §14a of the Renewable Energy Act (EnWG) and MiSpel (Marktintegration von Speichern und Ladepunkten / Market integration of storage and charge points) incentivize smarter, more grid-friendly charging and feed-in of stored energy back to the grid via vehicle-to-grid technology. EVs at home are thus no longer unidirectional consumers but rather intelligent storage devices that can lower both energy bills and overall energy system costs.

The implication is clear: scaling EV adoption will not depend on public infrastructure alone but also on how intelligently charging is managed in the home and at destination charging sites.

Residential charging in the Netherlands

Home charging meets solar integration

Home charging remains the backbone of the Dutch EV system, delivering 54% of charging energy. Access is high but not universal, with 47% of new EV drivers having a home charger and using it frequently (~11 sessions per month). Solar integration is widespread. 90% of home-charging EV drivers have PV, and 70% align charging with solar generation, making home charging a self-consumption strategy. Smart charging is now mainstream, with over half of sessions managed intelligently and growing participation in dynamic tariffs.

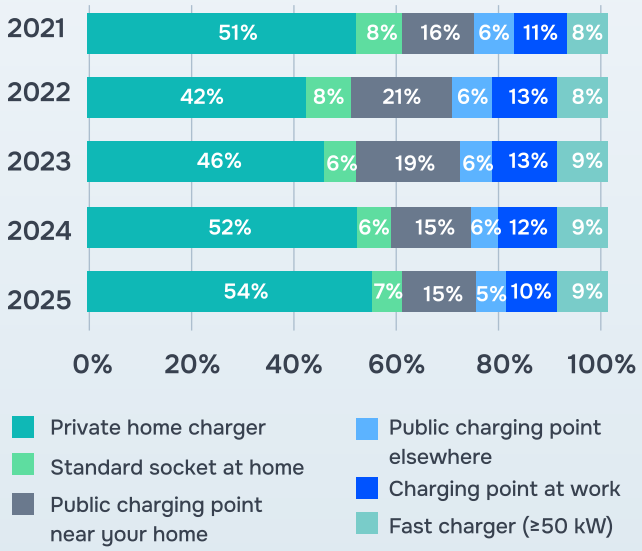


Source: 42

Wallbox and fast charging are on the rise

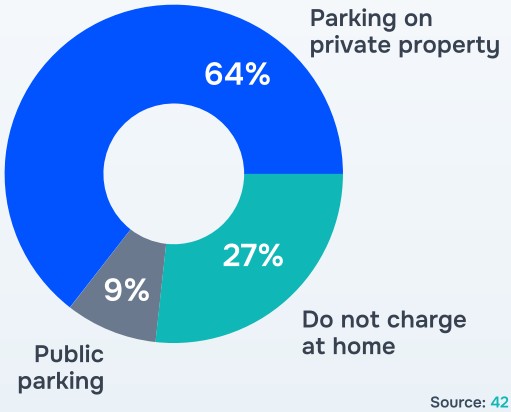
Private wallbox and fast charging are increasing, reinforcing the transition toward higher-power, managed charging.

Standard socket charging remains stable at a low share, suggesting that basic home charging persists but is not scaling with the broader market.



Source: 42

Home charging is important



Source: 42

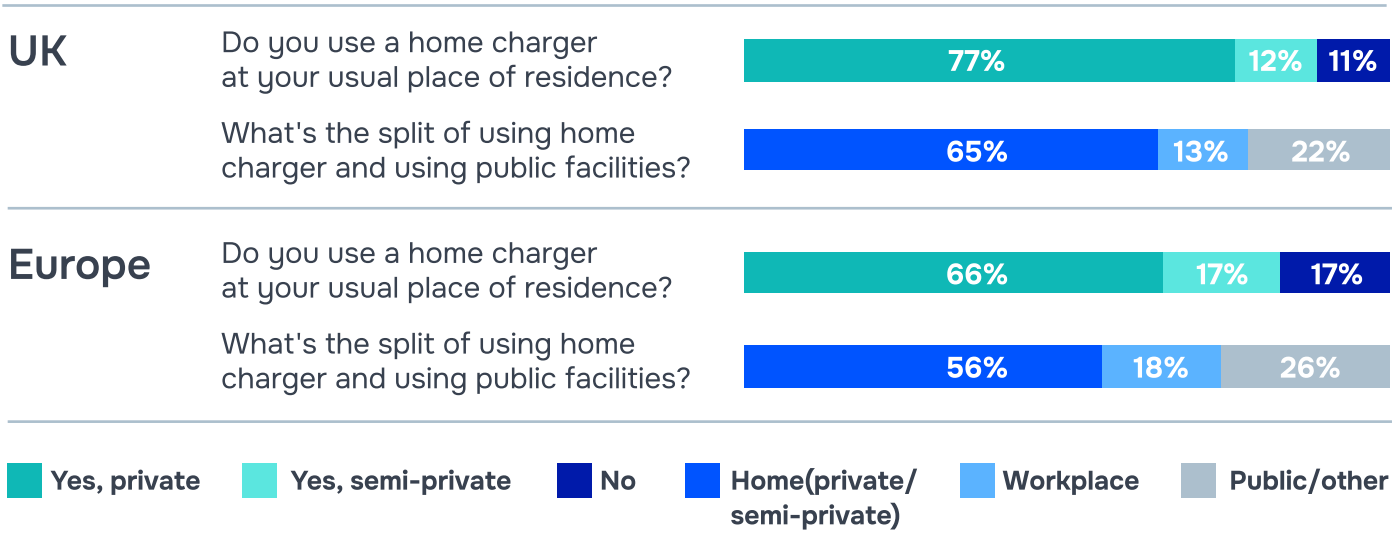
Home charging remains viable beyond driveway households. In 2025, 9% of EV drivers rely on public space parking while still charging at home, showing that private charging is not limited to private property.

At the same time, 27% of drivers do not charge at home, highlighting the remaining access gap. Still, the overall share of EV drivers charging at home is increasing – up from 67% in 2022 – reinforcing home charging as the dominant and expanding charging behavior.

Residential charging in the UK

Home charging: The backbone of the transition

Around 65% of EV charging in the UK currently occurs at home, making residential infrastructure the essential backbone of the national network. This is nine percentage points higher than in Europe. Potloc and Roland Berger's survey of 12,000 EV drivers also found that the share of EV owners, who use a home charger at their usual place of residence is 11 percentage points higher than in mainland Europe.



Sources: Potloc and Roland Berger EV Charging Index Survey 2025

Source: 43

Targeted support to close the 'driveway divide'

A divide remains between those who have access to off-street parking and those who don't. It is particularly pertinent as home charging costs on average 81% less than public charging in the UK. Government policy is attempting to bridge this 'driveway divide'.[44] Since 2022, the EV Chargepoint Grant has funded over 28,000 residential installations for renters and flat owners, with approximately 12,500 of these completed in the last year alone.

The ZEV mandate vs. market reality

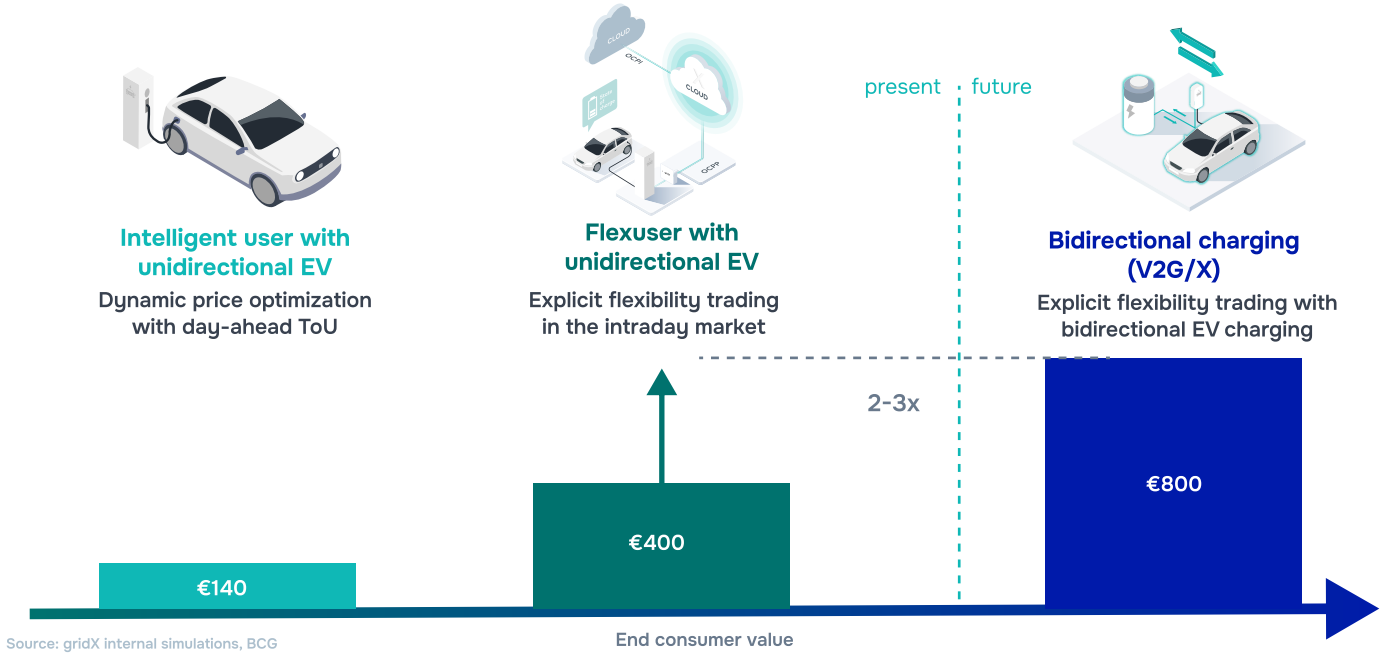
The Zero Emission Vehicle (ZEV) Mandate legally requires manufacturers to hit rising sales targets for new electric cars. By 2026, this target climbs to 33%, yet 2025 registrations reached only ~22%.[45] This ~11% shortfall highlights the urgent need for infrastructure that supports the 'mass market' buyer who lacks a home charger.

Public charging is expensive but constantly improving

The Roland Berger survey found that 84% of UK BEV users found that public charging had become more convenient over the past six months, figure higher than both the European and global average. A growing share are also satisfied with the speed of public charging infrastructure, likely due to the constantly growing share of fast DC chargers.

This highlights the importance of having a diverse e-mobility offering across home, destination and fast en-route charging to suit all EV users' needs and guarantee a fair mobility transition.

End user savings with an EV and wallbox

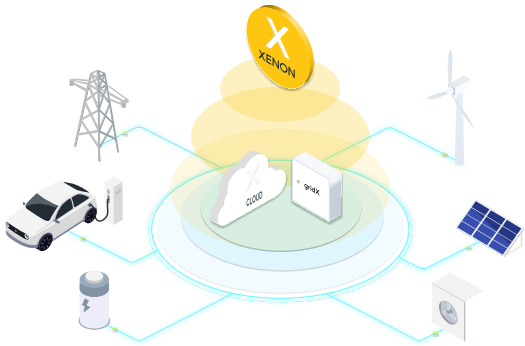


Source: gridX internal simulations, BCG

An end user with an electric vehicle and wallbox at home can lower their annual energy bill by up to €800 by leveraging bidirectional charging and making the flexibility of their EV available for trading. At the same time, energy retailers tap into new revenue streams and stabilize the grid by shifting charging and discharging to better meet overall supply and demand.

Seamless integration across diverse hardware ecosystems

As homeowners and site operators add more clean energy assets from a range of manufacturers to their sites (namely photovoltaic and storage systems), the cost savings potential increases exponentially. However, this increases the need for seamless interoperability.



XENON acts as the central orchestrator, ensuring that all hardware components – from different charger models (AC and DC) to batteries and solar inverters – work smoothly together. By not only supporting open industry standards but also working closely with all major OEMs, the platform eliminates the need for custom-built workarounds.

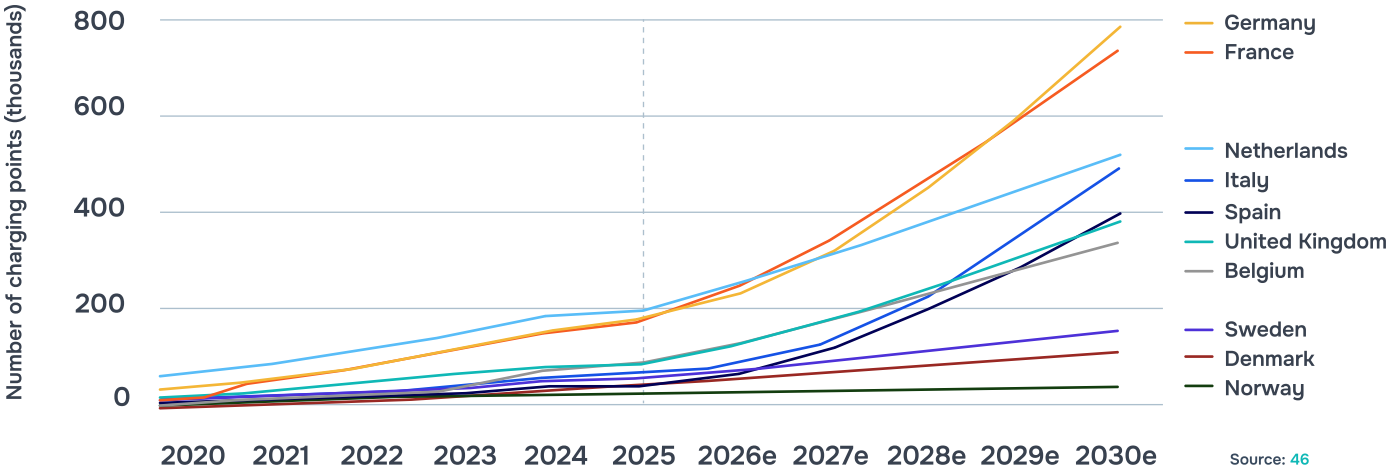
At the forefront of our interoperability efforts sits our Ready for gridX initiative, which simplifies hardware integration and installation and enhances performance reliability across the product lifecycle.

> “End users are attracted to clean energy solutions if they are confident these systems will work seamlessly and reliably. We enjoy working with gridX because the resulting smooth interoperability with other devices ensures our continuous flexibility to adapt to new regulations and use cases. Together with gridX, we deliver a robust and future-ready home charging setup that empowers end users to get the most value at the lowest cost out of charging their electric vehicle.”

Erik Yesayan, CEO

The hockey stick curve starts now

Projected public charging infrastructure in selected European markets, 2020-2030



Note: Based on an S-shaped adoption curve and stable national preferences for the number of chargers per EV.

Even though the rate of growth of electric vehicles and charge points in Europe dipped slightly in 2025 due to grid congestion issues, the market is predicted to be entering its next stage of growth. Enabling this transition will depend on digital solutions that allow for more cost-efficient scaling, reducing operational costs and unlocking new revenue streams. To enable this, charge point operators must leverage cutting-edge digital solutions like peak shaving, virtual grid extension with battery energy storage systems and photovoltaics, DSO signaling, dynamic tariff optimization and explicit flexibility services.

In the home, EV chargers must be intelligently integrated with other assets as well as signals from the market and the grid. This enables multiple use cases that lower costs for end users and create a real incentive for them to invest in new technologies.

For e-mobility to reach the mainstream, scaling must accelerate across all charging types. Every location requires smart solutions to turn an EV from a burden into an asset. The next few years will be a turning point: future leaders will be defined by the innovative solutions they roll out now.

> “Without orchestration, growth in electric vehicle charging creates new constraints. We are thus moving from infrastructure expansion to intelligent connectivity and flexibility. What sets energy and e-mobility players apart now is not scale alone but how intelligently that scale is managed and monetized. The next phase of EV adoption will be defined by how effectively distributed assets are turned into coordinated, flexible systems.”

Anne B. Bicking
CEO
gridX

About us

Building the digital infrastructure for the energy transition

Our product

XENON: Your EMS with guaranteed success

Build your own energy management solution on top of our energy management platform. Save time, resources and complexity. Turn energy assets into real customer value with XENON's powerful energy management and leading set of stackable use cases. Combine it with a robust local gateway, end-to-end services and the industry's most extensive network of players to guarantee a successful rollout.

XENON allows you to connect, monitor and control distributed energy resources such as PV systems, EV chargers, heat pumps and batteries from 50+ different manufacturers.

Book a demo to learn more.

Our e-mobility solution

XENON not only provides solutions to common challenges faced by CPOs, but it has been "battle-tested" in the field. This was our **growth in 2025**:

- 100% Growth in EVCI sites
- 55% Growth in connected EV chargers
- 15 Countries with actively managed systems

50+
Supported OEMs
Connect to devices from around 50+ different manufacturers.

225,000+
Assets connected
Use our turnkey modules to build a solution that suits your needs.

99.95 %
Guaranteed uptime
Use one platform for all your energy solutions.

Our company

Join the mission

Climate change is the biggest challenge of our time and the energy sector is the biggest carbon emitter. We can't solve the climate crisis without electrifying mobility, which can't happen without smart charging solutions. gridX is looking for more talent to help us accelerate the energy transition with cutting-edge digital solutions.

200+
People
across four departments

2
Offices
in Aachen and Munich plus fully remote positions (EU)

37
Nationalities
from six continents

We're hiring

SOURCES

Sources

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9 Brussels Signal, Italy's €600 million subsidies for electric vehicles snapped up immediately

10 Qwello, Qwello acquires leading Dutch player Park & Charge

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15 Fastned, 2025 Results

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32 Bundesnetzagentur, Elektromobilität Öffentliche Ladeinfrastruktur

33 Motus, Le Infrastrutture di Ricarica a uso Pubblico in Italia

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gridX GmbH

E-Mail: info@gridx.ai

www.gridX.ai

SOURCES

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gridX GmbH

E-Mail: info@gridx.ai

www.gridX.ai