

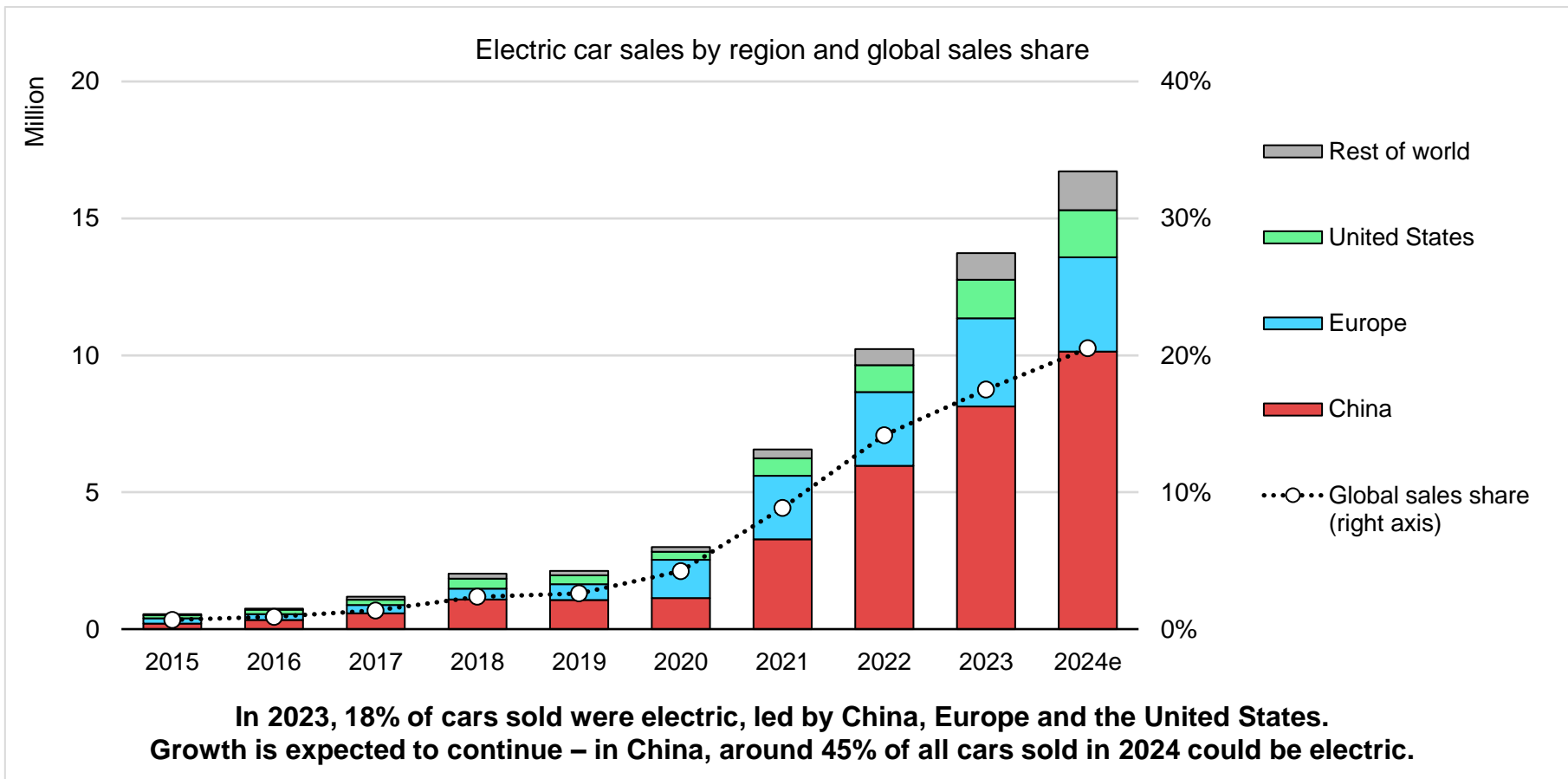


Status and outlook of the European charging infrastructure

Jules SER Y

OFATE - Webinar on grid integration of electric vehicles in Europe - 16th of October 2024

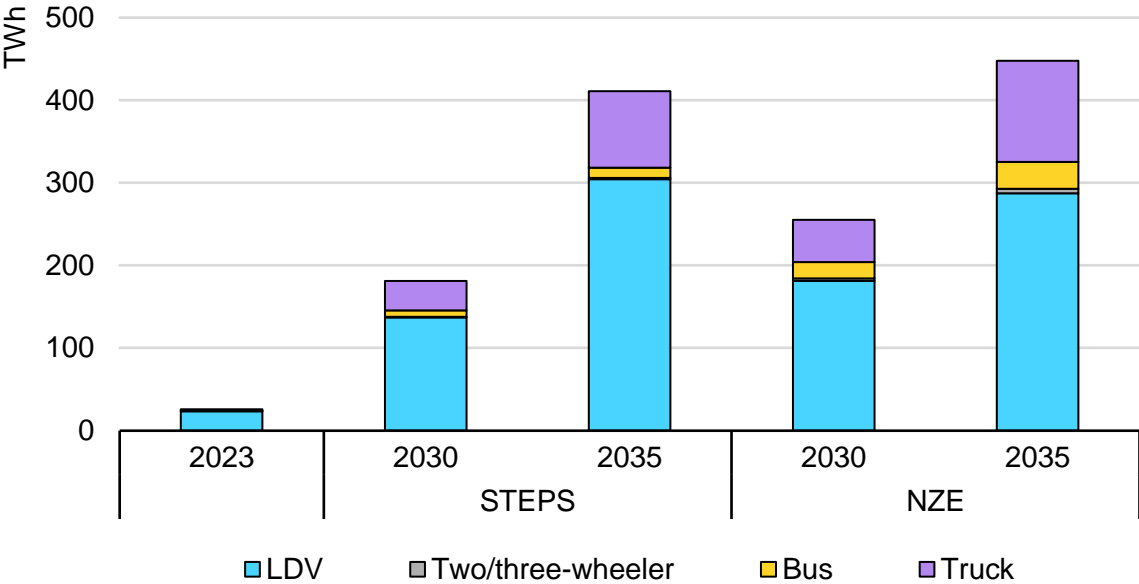
2024 is set to be another record year for electric car sales



Electricity demand

EV charging demand and faster charging will grow substantially

Electricity demand due to EV charging by mode in the EU, 2023-2035

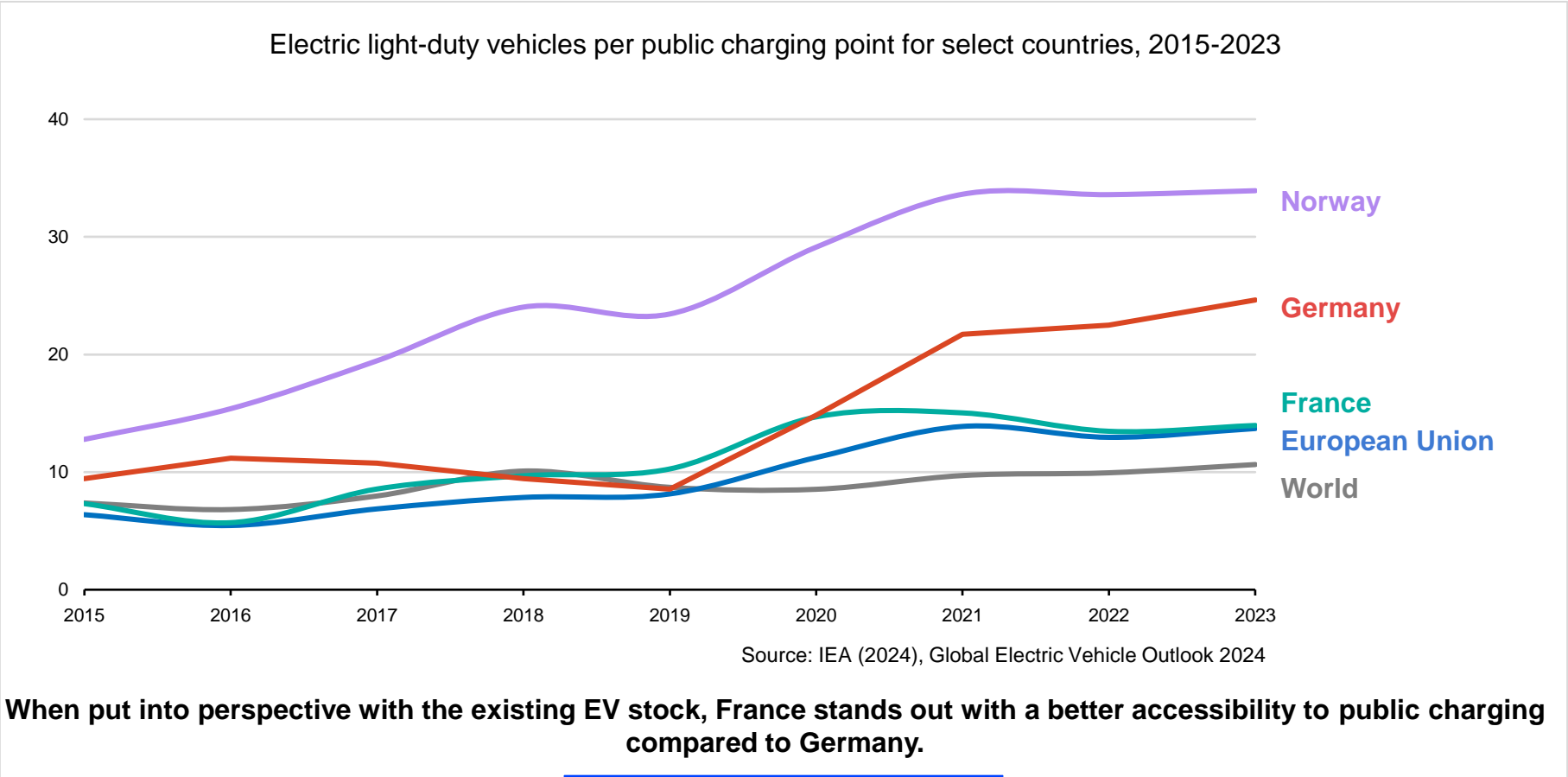


Source: IEA (2024), Global Electric Vehicle Outlook 2024

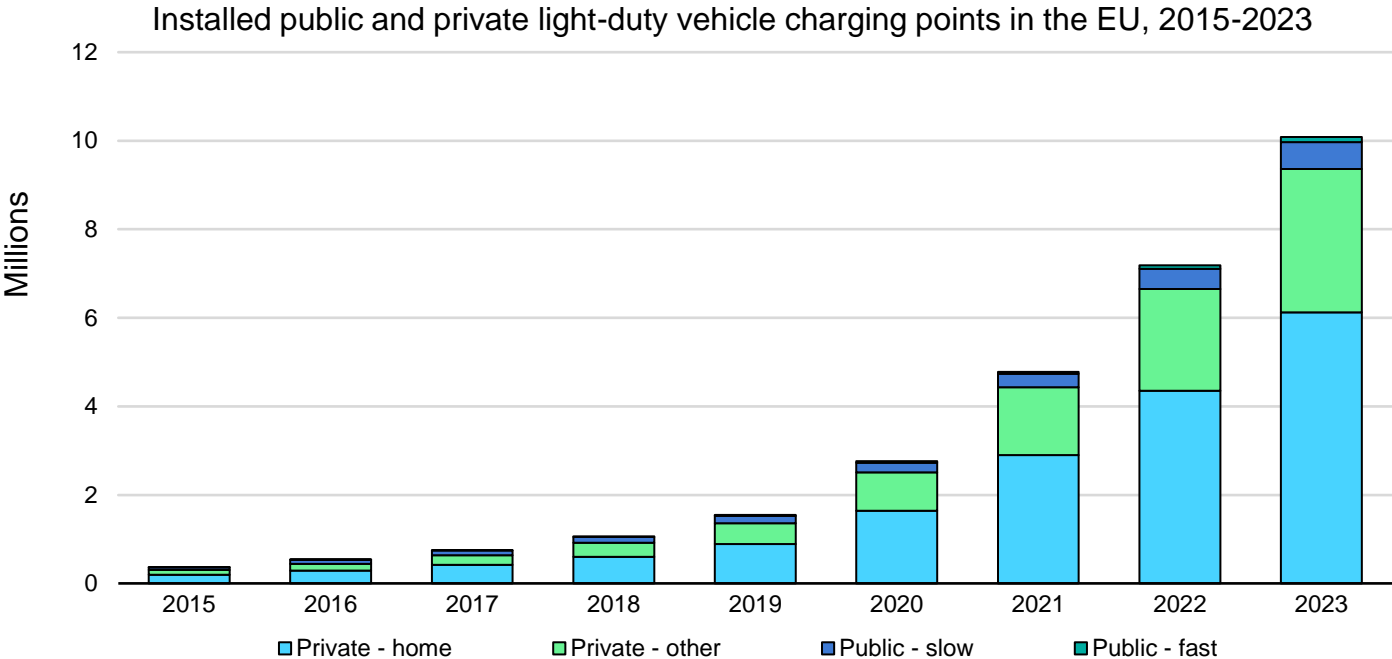
EV charging demand will grow from 25 TWh today to 410 TWh in 2030.
Larger vehicle sizes (which require faster charging) could account for over one-quarter of EV charging demand.

EVSE status

Roll-out of public charging is critical to enable mass EV adoption



Private charging remains the most common option

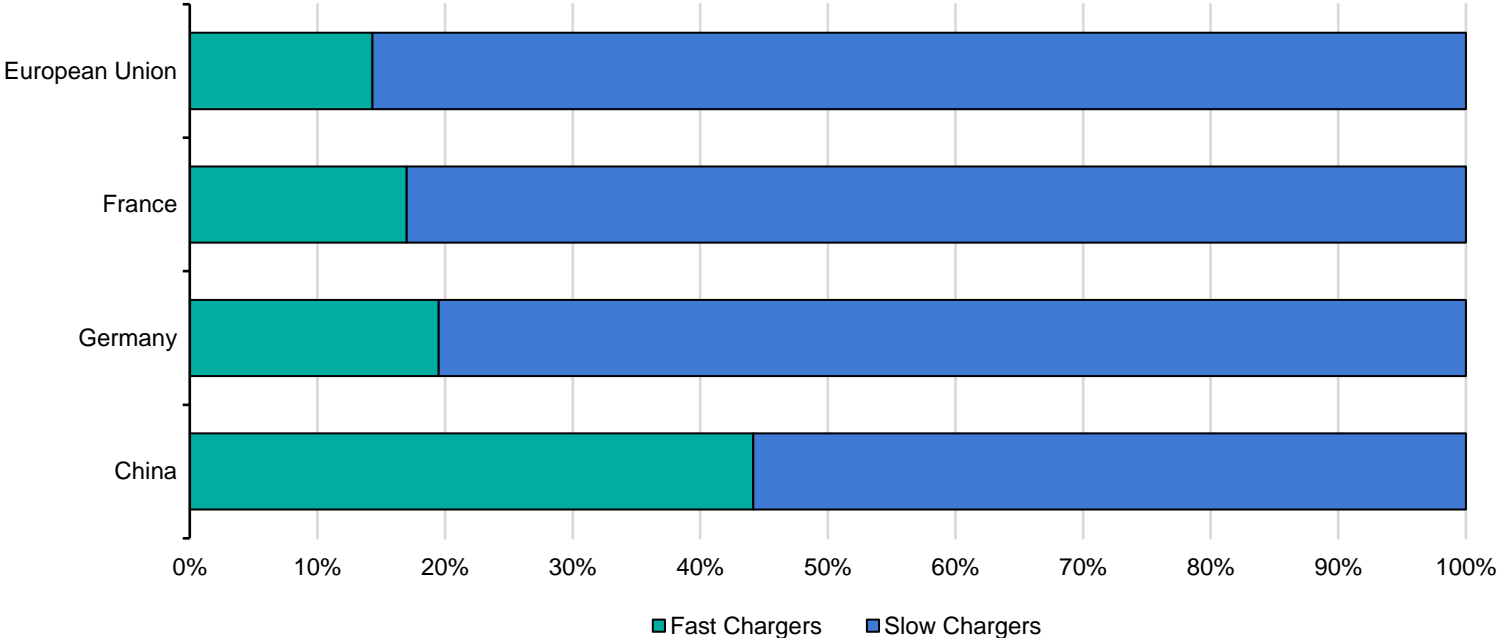


Home and other private chargers are assumed to be slow chargers that provide power up to 22 kW; Fast chargers at over 22 kW.
Source: IEA (2024), Global Electric Vehicle Outlook 2024

In Europe most EV owner have access to private home charging solutions. As the EV market penetration intensifies the need for public charging increases.

Public charging deployment

Proportion of fast and slow public chargers in total public chargers, 2023

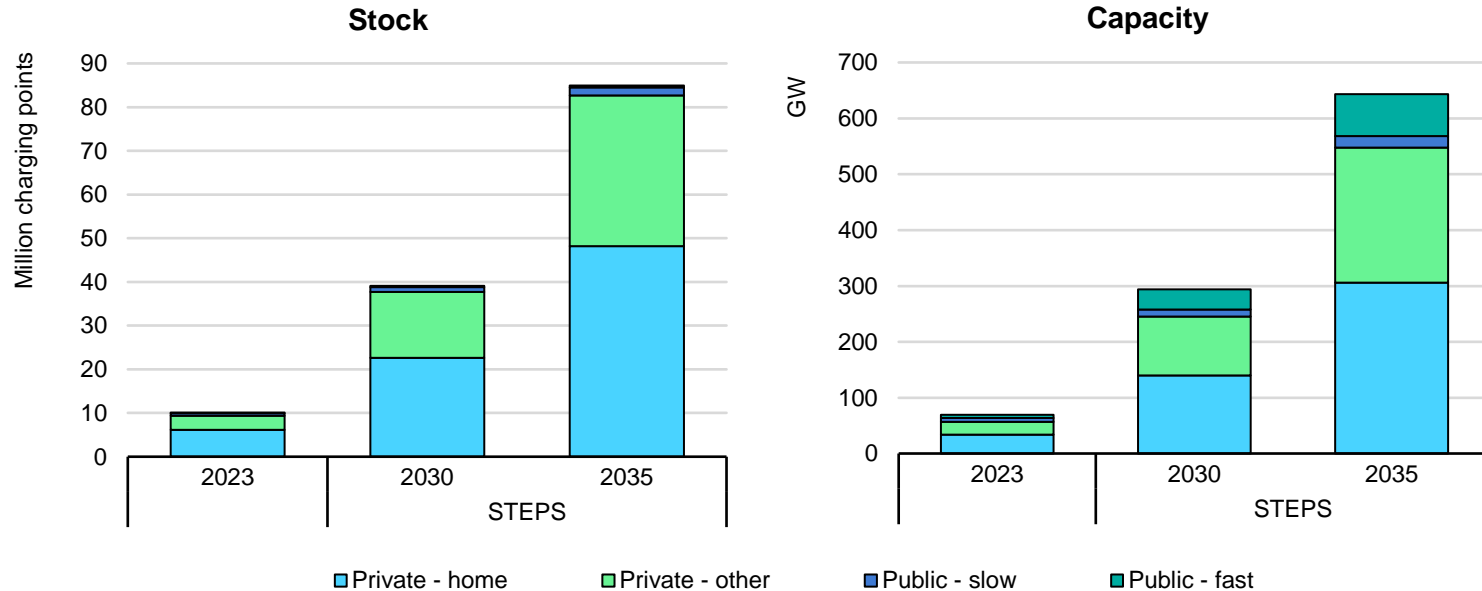


European countries lag behind China in terms of fast chargers share in public charging points.

EVSE outlook

Private chargers will remain the primary charging solution

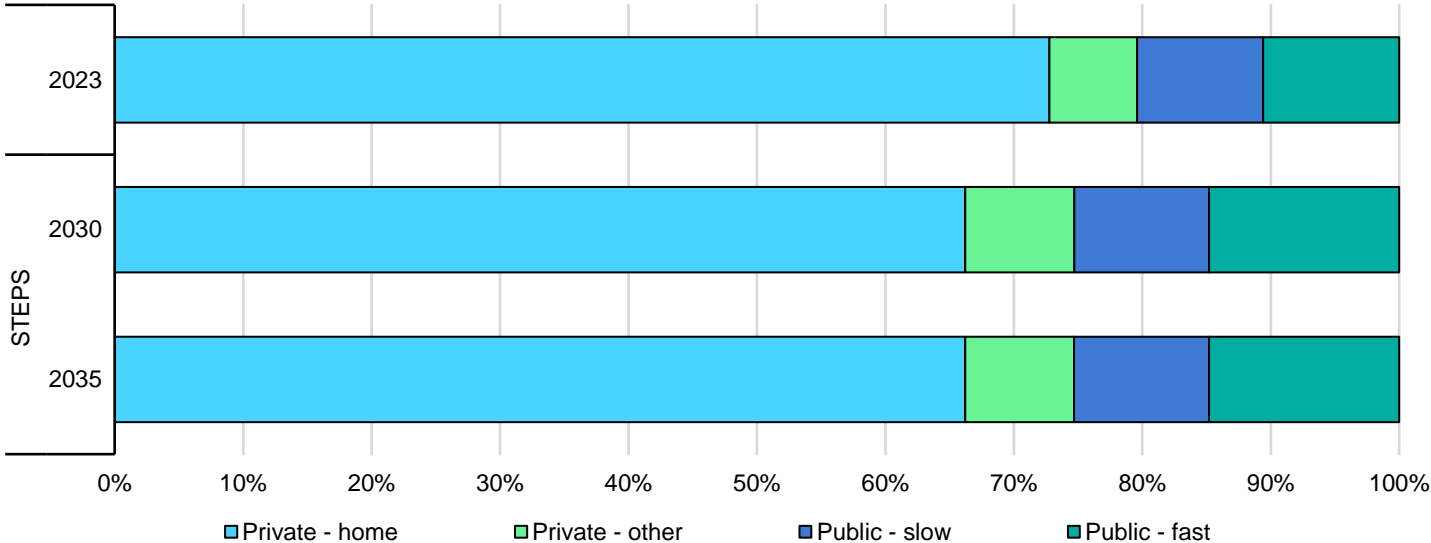
Light-duty vehicle charger stock and capacity in the EU, 2023-2035



Private chargers will make the vast majority of charging points despite fast public chargers accounting for a growing share of capacity.

Private chargers will remain the primary charging solution

Electricity delivered to electric light-duty vehicles by charger type in the European Union, 2023-2035






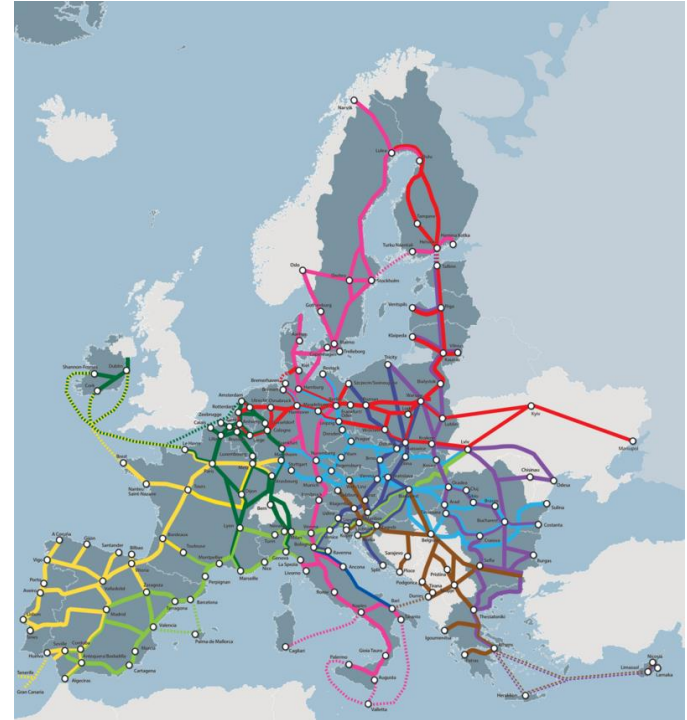
Home and other private chargers are assumed to be slow chargers that provide power up to 22 kW; Fast chargers at over 22 kW.

Private chargers are projected to deliver more than two-third of the electricity consumed by electric cars.

Regulatory framework and policies

Current policy framework in the Union : AFIR

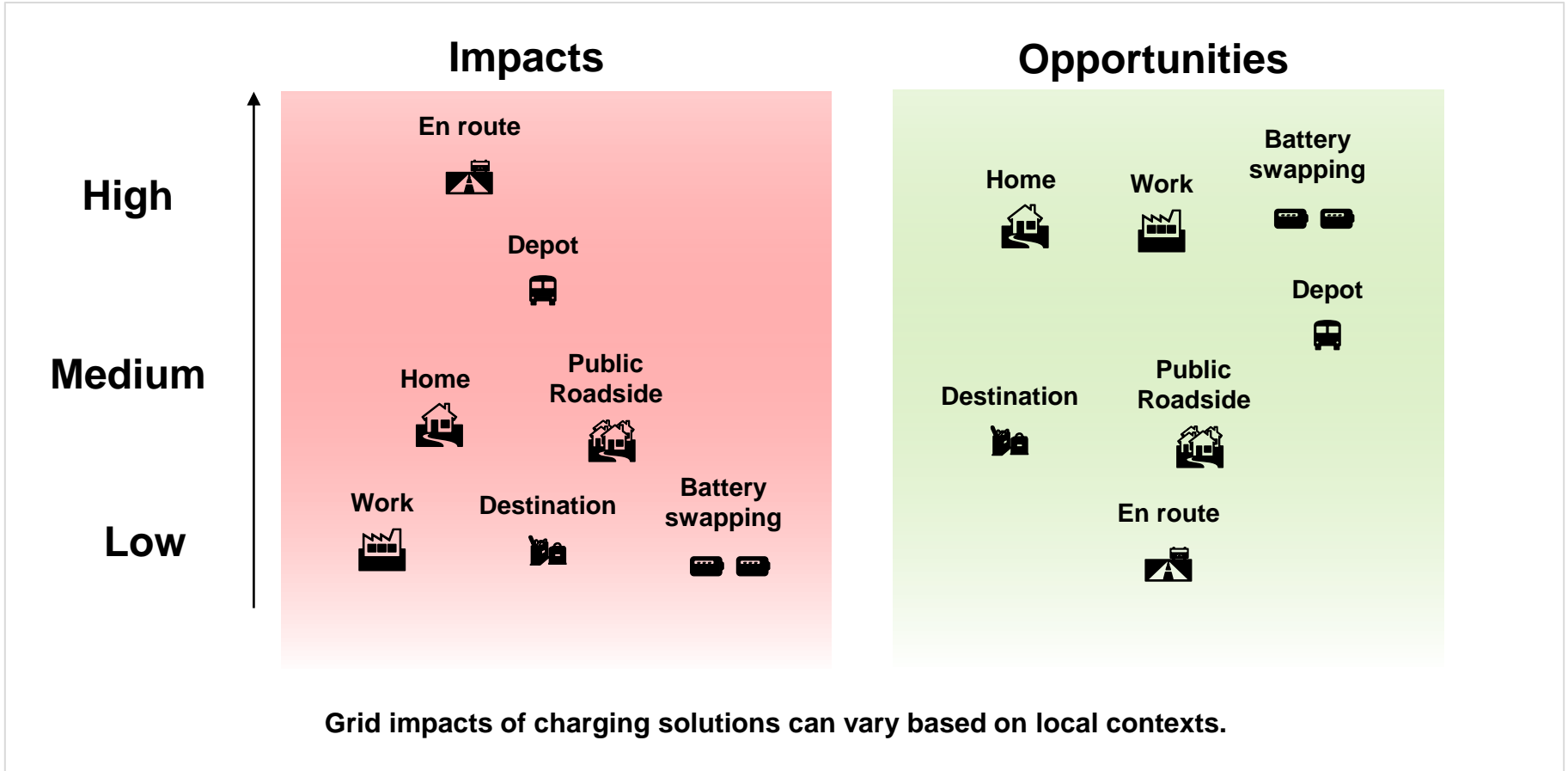
- Adopted by the EU in 2023, the Alternative Fuels Infrastructure Regulation (**AFIR**) is part of the EU’s “Fit for 55” policy package meant to reduce GHG emissions by 55% by 2030, compared to 1990 levels.
- The AFIR sets legally binding targets :
 -  **Fleet-based targets:** Ensure that 1.3 kW of public charger is available for each electric car and van registered.
 - **Distance-based targets:**
 -  ✓ **LDVs:** Fast-charging stations (150 kW) every 60 km along the core corridors of TEN-T Network by 2025. Extension to the comprehensive (finer network) TEN-T by 2035.
 -  ✓ **HDFs:** Fast-charging stations (350 kW) every 60 km along a reduced part of the TEN-T core network by 2025, and complete coverage by 2030.
- IEA ‘s [EV policy explorer](#) to browse EVSE related policies EU- and nation-wide.



Core TEN-T Network. *Source:* TENtec European Commission.

Grid integration – a case study of truck charging

Grid impacts and opportunities vary according to charging type

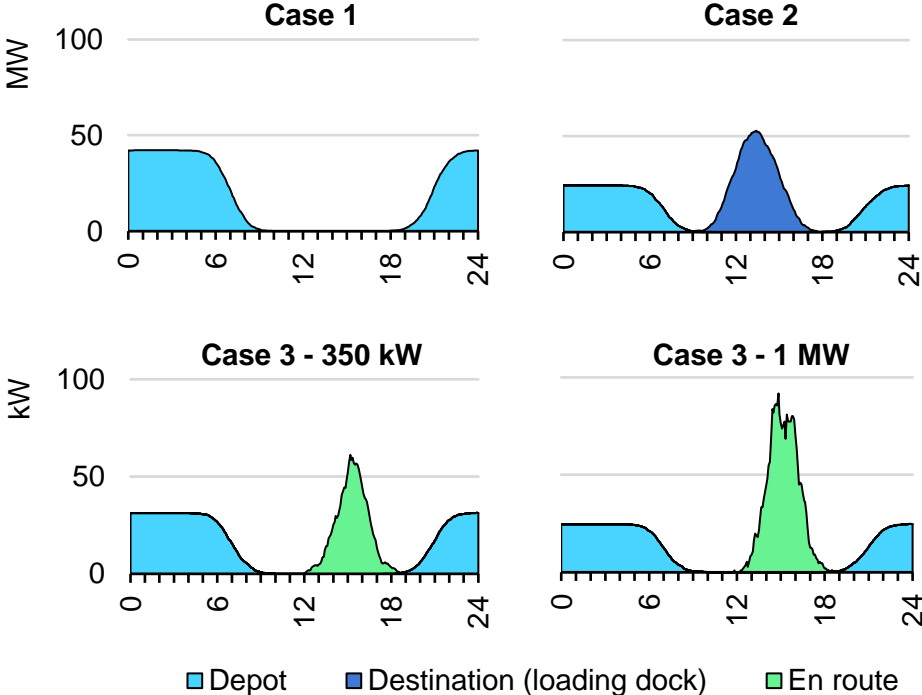


Grid impacts of charging solutions can vary based on local contexts.

Special focus: examining the impacts truck charging on grid



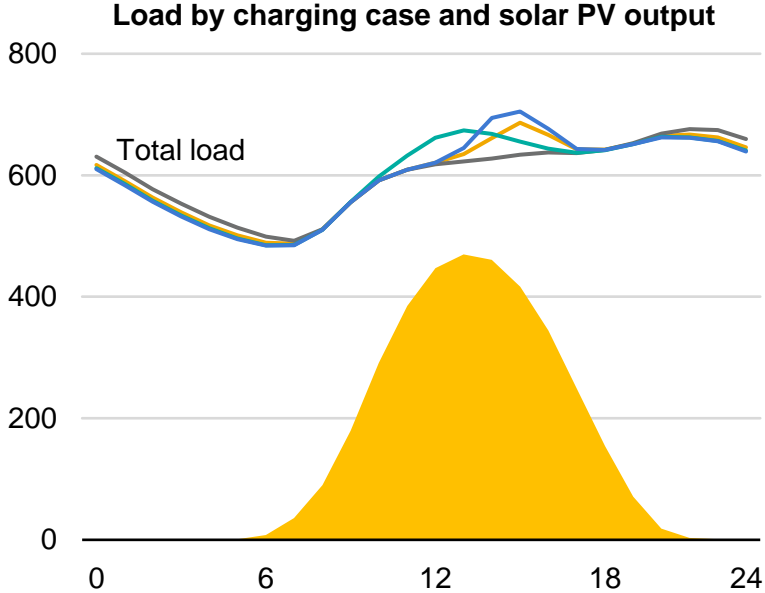
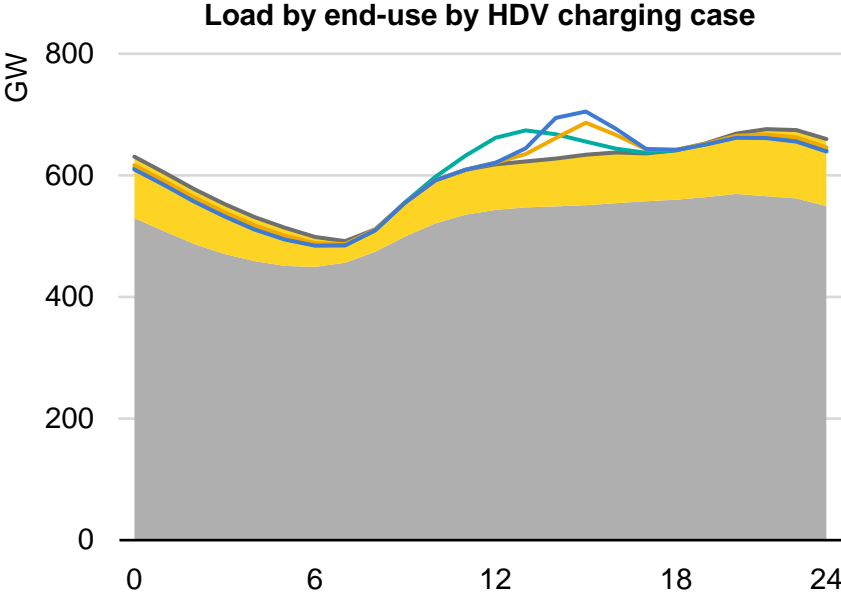
Truck charging profiles for a 1000-vehicle fleet – Case study, Global Electric Vehicle Outlook 2024 (IEA)



Truck charging impact can be better addressed through 3 dimensions: When, Where and How much ?

Special focus: examining the impacts truck charging on grid

Impact on total daily electricity load in the EU in the Announced Pledges Scenario, 2035



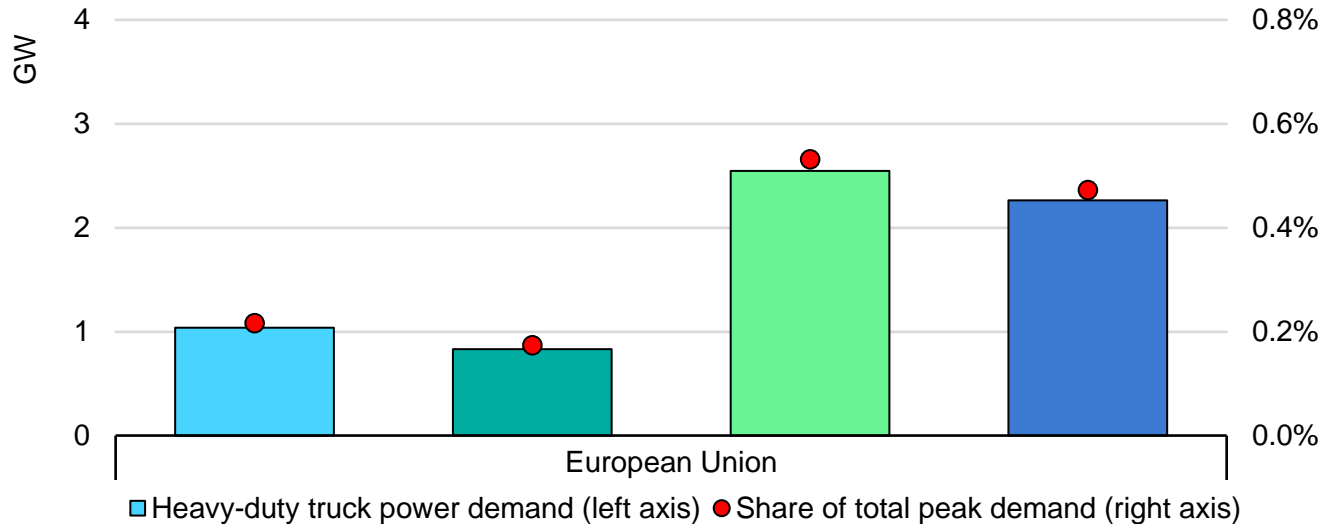
Other
 Transport
 Case 1
 Case 2
 Case 3 - 350 kW
 Case 3 - 1 MW

(overnight depot) (+ loading dock) (overnight depot & 350kW or 1 MW en-route)

Up to almost 50% of the daily charging needs of heavy-duty trucks are met during daylight hours in the cases that include fast daytime charging.

HDVs would not contribute significantly to evening peak demand

Average electric truck power demand between 5 and 8 PM by region and case in the Announced Pledges Scenario, 2035

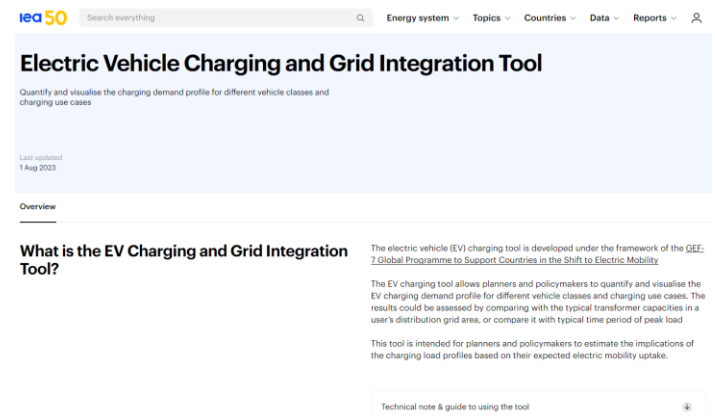
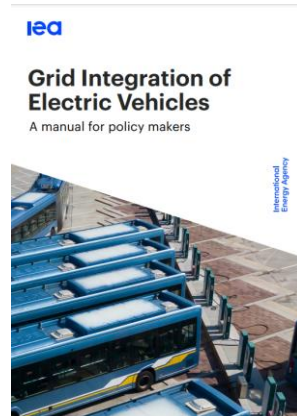


— Case 1 (overnight depot) — Case 2 (overnight depot & loading dock) — Case 3 - 350 kW (overnight depot & 350 kW en-route) — Case 3 - 1 MW (overnight depot & 1 MW en-route)

Heavy-duty trucks account for under 0.6% of peak evening power demand by 2035 in the APS in these regions. Smart charging, anticipatory planning, batteries, and other measures will be key to manage local challenges.

IEA reports and resources

- [Global EV Outlook 2024](#)
- [Policy Brief on Public Charging Infrastructure – Analysis - IEA](#)
- [Grid Integration of Electric Vehicles – Analysis – IEA](#)
- [EV Charging and Grid Integration tool](#)



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