

## Charging infrastructure needs for battery-electric trucks in the European Union by 2030

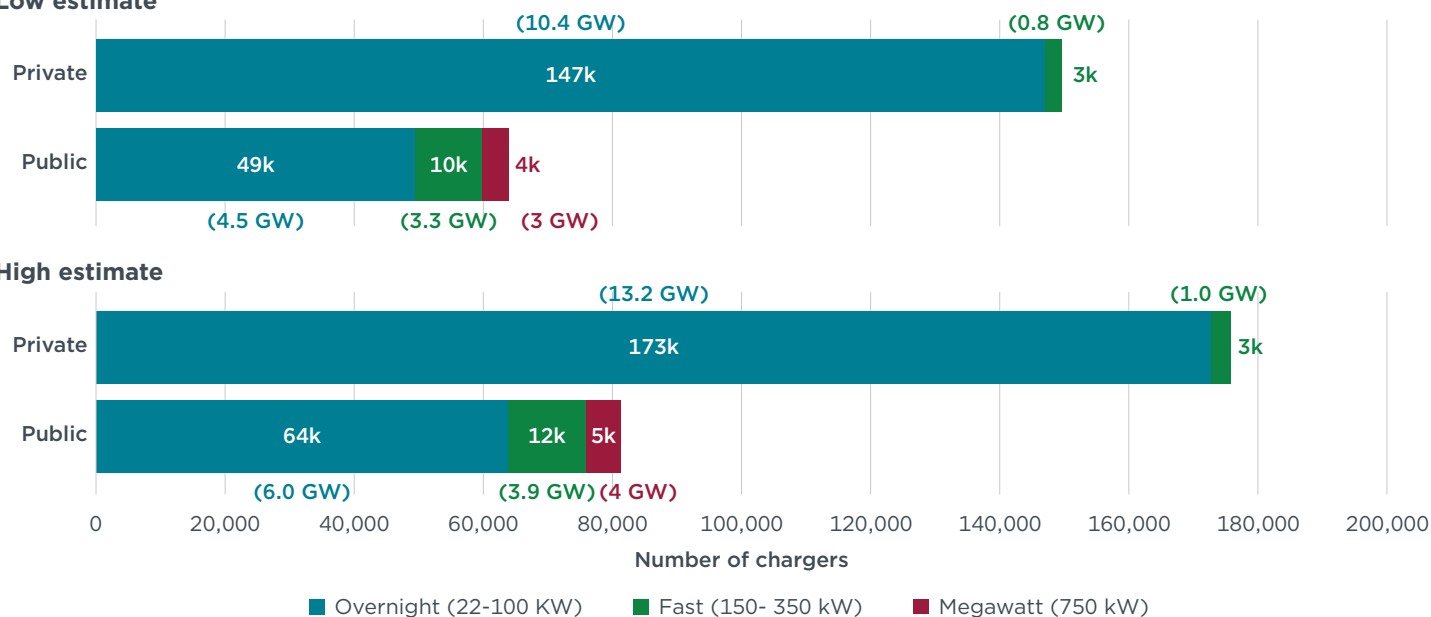
Truck manufacturers in the European Union (EU) will need to ramp up their sales of battery-electric trucks (BETs) to comply with the EU 45% CO<sub>2</sub> reduction targets for heavy-duty vehicles (HDVs) by 2030. This growing BET fleet will require an extensive network of truck-dedicated chargers. In 2023, the EU adopted the Alternative Fuels Infrastructure Regulation (AFIR) to ensure minimum infrastructure support for alternative fuel vehicles, including BETs. [A new ICCT study](#) quantifies BET charging needs in the EU-27 by 2030 and compares them to the AFIR targets by modeling the expected stock of BETs and considering their energy consumption, driving patterns, and charging behavior. We conclude the following:

- » **The expected BET fleet in the EU-27 by 2030 will require between 22 GW and 28 GW of installed charging power capacity.** This projected capacity is split almost equally between public and private chargers. Depending on the market uptake of BETs, this translates into 150,000–175,000 private chargers and 60,000–80,000 public chargers.
- » **Overnight charging is expected to be the primary charging mode, while between 4,000 and 5,300 megawatt (MW) chargers are projected to be needed by 2030.** MW chargers are expected to comprise almost 15% of the total installed charging power needs, but only 2% of the total number of chargers. Lower-power chargers, such as 350 kW chargers, can cover more than half the public fast charging needs for long-haul trucks.

**Figure 1**

**Total number of chargers and charging power needed by 2030, in Low and a High BET market uptake scenarios**

**Low estimate**

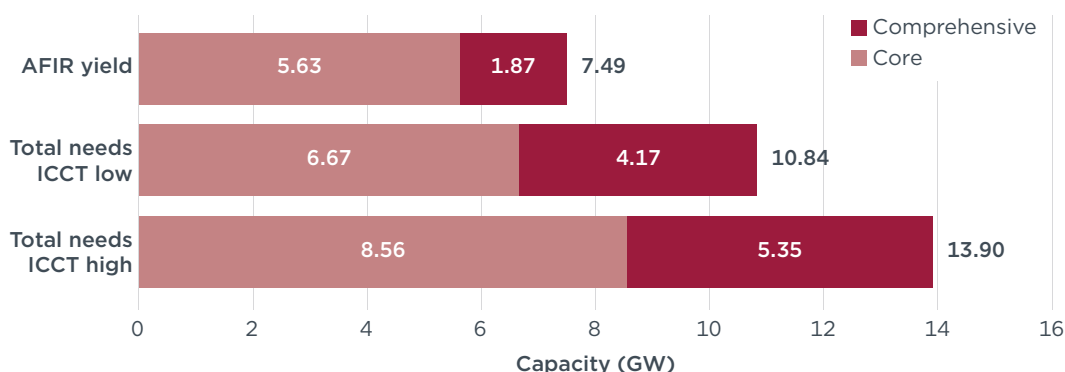


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» **The AFIR is expected to cover between 50% and 70% of public charging needs in the EU-27 by 2030.** Across the core Trans-European Transport Network (TEN-T), the AFIR targets are expected to cover between 65% and 85% of total charging needs, while across the comprehensive TEN-T, the coverage drops to 35%–45%. According to an approximation of state-level AFIR targets based on the extent of the TEN-T network in each state, coverage at the Member State level varies widely. The targets only cover 30%–50% of the expected public charging needs in half of Member States, including countries such as the Netherlands and Belgium, whereas for countries like Romania, the target is twice as high as the expected charging needs.

**Figure 2**

**Total installed charger power targeted under the AFIR and projected public charging needs under Low and High BET market uptake scenarios**



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The AFIR targets, if implemented, would thus provide for basic coverage and facilitate the deployment of additional charging infrastructure through market forces. However, the scale of the required charging infrastructure is likely to pose challenges to local

grids, especially at high-power charging sites across the TEN-T network, mainly due to grid congestion challenges, lengthy permitting procedures, and investment hurdles. Many of those challenges can be addressed in the review of the AFIR and other complementary policies on grid planning, permitting, and investment. EU policymakers can consider the following policy options:

- » **Promote initiatives that focus on the deployment of HDV-specific charging infrastructure across key transport corridors in the EU**, such as the Clean Transport Corridor Initiative. This will accelerate charging deployment in critical corridors of the TEN-T network and enable the application of best practices to fast-track and streamline the infrastructure build-out across other corridors.
- » **Accelerate and streamline the charging infrastructure deployment process and grid permitting**. Categorizing HDV charging stations and their connection to the grid as projects in the overriding public interest can enable the fast-tracking permitting procedures. In addition, streamlining the process across the EU can reduce the burden on charge point operators, ensuring a more efficient planning.
- » **Empower grid operators to make proactive, anticipatory investments**. The existing demand-driven reactive approach to grid planning can significantly delay grid upgrades. Proactive grid planning is essential to ensure the charging infrastructure is deployed in due time. National energy regulators are encouraged to support such investments through proper regulatory frameworks.
- » **Promote transparency regarding grid hosting capacities and streamline the type and format of the reported data**. Such maps can help charge point operators and depot owners carry out self-assessments of grid connection feasibility in locations of interest, enabling faster investment decisions, shortening the grid connection time, and reducing the burden on local grid operators.

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## PUBLICATION DETAILS

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