

DECARBONISING HEAVY-DUTY ROAD TRANSPORT - THE ROLE OF GRIDS

JOINT POLICY RECOMMENDATIONS

ACEA - EURELECTRIC

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Background

Commercial vehicle manufacturers and the electricity sector remain committed to Europe's climate neutrality ambitions and are driving the transition to fossil-free road transport by 2040.

The revised CO₂ reduction targets for heavy-duty vehicles (EU) Regulation 2024/1610) set an ambitious trajectory for the market uptake of zero-emission vehicles, which also provides investment certainty for charging infrastructure providers. The CO₂ targets require approximately 300,000 - 400,000 zero-emission trucks on the road and up to one-third of new registrations to be ZEVs by 2030. Alongside this, Member States are required under the Alternative Fuels Infrastructure Regulation (AFIR) to meet distance-based targets along the core TEN-T corridors that ensure by 2030 public charging pools with a total power output of at least 3,600 kW every 60 km with at least two recharging points with at least 350 kW chargers. In order to meet both the vehicle and charging targets, all industry stakeholders must work together, and the EU and national governments must support them by setting up the appropriate policy framework.

Key enablers of the transition include the demand-oriented buildup of an adequate network of charging infrastructure suitable for heavy-duty vehicles, including mainly private depot chargers and also publicly accessible chargers with adequate charging power that will utilise the Megawatt Charging System (MCS). In an early ramp-up phase, depot charging infrastructure plays a crucial role, especially in enabling the operation of medium range, such as regional delivery, vehicles. However, meeting the CO₂ targets requires a rapid and significant market uptake of zero-emission long-haul vehicles until 2030, which will also rely on the timely rollout of public charging infrastructure. Coordinating the parallel rollout of en-route charging infrastructure and ZEV market uptake to ensure commercially viable solutions for all stakeholders is critically important.

Grids, and particularly Distribution System Operators (DSOs), play a crucial role in enabling the deployment of charging infrastructure and the necessary grid upgrades. However, existing regulations hinder the pace of investment needed to support this transition. For operators of charging infrastructure, there is a need for further political

measures, such as reduced bureaucracy, acceleration, standardization, digitalization of grid connections and building permits, transparent and non-discriminatory access to public sites, and support for a strong ramp-up of zero-emission vehicles. Unlike passenger cars, heavy-duty vehicles (HDVs) have significantly higher power demands, larger batteries, and more frequent charging cycles.

Therefore, a tailored regulatory framework is essential to prevent unintended barriers to ZEV adoption and for the rollout of it supporting infrastructure, especially for heavy-duty vehicles.

Policy recommendations

1. Accelerate anticipatory investments and permitting for the grid

The current regulatory framework often leads to delayed grid upgrades, creating bottlenecks for the rollout of HDV charging infrastructure. To address this, DSOs must be empowered to make anticipatory investments based on projected HDV charging demands, particularly along major transport routes (TEN-T), in urban nodes and for depot charging. A shift from reactive to proactive grid planning will be required, with streamlined permitting processes, and the optimisation of the existing grid infrastructure. This should be reflected in the upcoming guidance on anticipatory investments for charging infrastructure, as well as the foreseen provisions under the European Clean Transport Corridor Initiative that will allow grid planning and permitting to benefit like the acceleration zones under the Renewable Energy Directive (RED).

A task force on anticipatory investments is due to be launched soon, with the goal of facilitating access to both private and public funding. The focus should be on ensuring that grid capacity is ready when and where HDV charging is needed, not just after the demand has materialised. This also entails national regulatory authorities (NRAs) to have a clear mandate to support anticipatory investments in due time, yet ahead of the necessary volume ramp-up of ZE heavy-duty vehicles towards 2030.

2. Accelerate the rollout of a fit-for-purpose charging infrastructure network for heavy-duty vehicles

HDVs, unlike passenger cars, operate with high demands on uptime and total cost of ownership (TCO). Given that a truck battery is about ten times bigger than a car battery and experiences ten times more charging cycles, the regulatory framework must enable suitable fast and affordable charging options, taking into account that most of this will take place in overnight depot charging, but also will require en-route charging at truck stops. The framework should consider that HDVs are in use for 40 - 75% of the time, making parking time equal to charging time.

The focus should be on guaranteeing that the needed energy can be provided when and where required, with flexibility options such as **smart charging when the**

vehicle is parked after the work shift, provided it does not compromise the transport operator's schedule. For public en-route charging specifically, an efficient or high utilisation rate of charging infrastructure must also be ensured by the aligned heavy-duty vehicle ramp-up.

Additionally, the roll-out of Megawatt Charging Systems (MCS) en-route will be increasingly important and its standards and requirements must be supported by the vehicles themselves, charge points, and the grid.

The electricity cost must be competitive compared to diesel to also stimulate ZEV uptake. Thus, the Energy Taxation Directive (ETD) should be revised and subsidies and any fiscal incentives for fossil fuels in the transportation sector must be reduced and ultimately phased out to reduce the disproportionate tax burden on electricity compared to fossil fuel alternatives.

3. Grid hosting capacity maps are critical for effective planning and deployment of charging infrastructure.

However, there are no requirements on the granularity or format of these maps. We welcome the work of the EU DSO Entity and ENTSO-E in aggregating information from the network development plans and developing harmonised definitions for available grid hosting capacity for system operators. Having a digital and readily accessible overview of available capacity in the grid are crucial for stakeholders to make investment decisions around purchasing electric vehicles and/or installing charging infrastructure. We point to the practices in the Netherlands (<https://capaciteitskaart.netbeheernederland.nl/>) as a positive example.

4. Implement a transparent and fair remuneration framework for DSOs

A fair and predictable return on investment for DSOs is essential for attracting private investment in grid infrastructure. The current system often uses backward-looking cost benchmarks that are inadequate for the transformational investment needed for HDV charging. Furthermore, the framework should avoid over-allocating risks to DSOs when network demand is uncertain. The weighted average cost of capital (WACC) must be adapted to current macroeconomic conditions to reflect the pace of investment needed.

The framework should also incentivise the use of flexibility by DSOs, such as time-based tariffs and participation in flexibility services. The framework should ensure national dialogue between Member States, NRAs, TSOs and DSOs.

5. Address supply chain bottlenecks and reduce lead times

The rapid expansion of the grid requires a secure supply chain for critical materials and components. The EU needs to address the supply chain challenges for materials

such as transformers, copper, aluminium, cables and electrical steel. In addition, lead times for components are increasing, and prices for components have risen sharply. A resilient supply chain is essential for timely grid upgrades. Public procurement processes must be streamlined to shorten lead times and reduce the time it takes to deliver projects. Time-limited procurement procedures should be considered, as should dynamically updated monetary thresholds.

6. Promote the coordination of planning on data exchange and transparency for grid planning, as well as for the roll out of charging infrastructure

To ensure grid planning and infrastructure development reflect the needs of HDV charging, a general coordination of planning in related areas and data exchange must happen in a multidirectional fashion between OEMs, DSOs, CPOs and other market players. For instance, DSOs and CPOs need better data on anticipated charging demand from HDVs in order to make informed investment decisions. This should include data on depot charging and the needs of passing traffic. For system and charge point operators to best enable smart charging for customers who wish to participate, access to adequately interoperable data is critical.

Whereas grid operators should publish available capacity through the Distribution National Development Plan (DNDDP) process and provide reasonable response times and a standardized process for applications for grid connections. The Common European Data Space could be useful for hosting consolidated national grid maps.

Overall, the digitalisation of procedures and applications is necessary to shorten lead times and manage the number of applications for grid connections. Harmonised standards for these applications across the EU are needed.

7. Provide clear political guidance and a mandate for an evolution from the ‘first come first served’ principle for grid connections

As regulated businesses, system operators should not be in the position to positively or negatively discriminate against their customers. However, DSOs have noted that the default first come, first served principle has had unintended consequences and led to inefficiencies in managing the significant increase in connection requests in many Member States. NRAs or national governments must therefore tackle the political question of prioritisation criteria or process and leave the system operators to execute based on this guidance.

In line with the recent Action Plan for the Automotive Sector, to facilitate this in the context of charging infrastructure for heavy-duty vehicles, it should be classified as ‘critical infrastructure’ under the European Clean Transport Corridor Initiative in order to fast-track grid planning and permitting. The corridors need to adequately cover the TEN-T network.

Furthermore, flexible connections should be enabled as a temporary solution before physical grid reinforcement. This can facilitate the early adoption of zero-emission trucks, however, the regulatory framework must support timely investment in the grid, with a clear timetable for the provision of firm capacity. Permanent flexible connection agreements could also be offered as a viable solution only if agreed by both parties. Provided that many HDV transport operators' business models are consistent in terms of when their vehicles are in operation vs parked and charging, time-based power contracts can provide transparency and predictability, making them also a potentially useful solution for the long-term in certain cases.