

Alternative fuel infrastructures for heavy-duty vehicles



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About **19% of transport green house gas (GHG) emissions are caused by heavy-duty vehicles (HDVs)** in road transport. Because of their Green House Gas (GHG) emission reduction potential, **alternatively fuelled low and zero-emission trucks** will play a major role in realising the **EU Green Deal and the 55% GHG reduction target for 2030** (the 'Fit for 55' legislative package aimed at aligning EU policies with the Green Deal objectives). It is therefore essential that there is sufficient and widespread recharging and refuelling infrastructure available.



The research

presents the opportunities and challenges for the use and deployment of alternative fuels infrastructure in the EU for heavy-duty vehicles, in particular trucks.

Main observations

The **European Commission's proposal for an Alternative Fuels Infrastructure Regulation (AFIR)** aims to ensure a **minimum level of infrastructure** and includes binding **distance-based targets** for the realisation of recharging and hydrogen refuelling points for trucks.

The **AFIR proposal** contains distance-based targets for both recharging points and refuelling stations for Battery electric trucks (BET) and Fuel cell electric truck (FCET) along the Trans-European Transport Network (TEN-T) corridors. The **TEN-T network is a relevant choice as a starting point for the roll-out of infrastructure** as the network has a relatively high traffic intensity of long distance trucks that particularly will need public recharging and refuelling infrastructure when electrified or fuelled with hydrogen.

Estimated future infrastructure requirements point to a need for overnight depot charging points as the main recharging concept for Battery electric trucks (BET). To a lesser extent, public overnight chargers and ultra-fast opportunity charging are required. For medium- and long-haul transport, however, **publicly accessible fast-charging and lower power overnight charging infrastructure is essential.**

Given the high power demand of truck charging at depots and roadside public charging stations, **the power grid and its capacity need to be suitably extended and adjusted to become future-proof.**

A strategic roll-out plan published together with the proposed Regulation contains a strategy and clearly defined actions to reduce barriers. For example, by means of funding mechanisms, standardisation and development of a data governance framework.

Conclusions and policy recommendation

The **AFIR proposal seems to cover the most relevant types of recharging and refuelling locations.** The proposed Regulation states, however, that authorities will need to support private parties in deploying such infrastructure at private locations as well.

Although liquid hydrogen can be a game changer in the coming years, the introduction of **binding targets for liquid hydrogen might be too early given the early phase of development of liquid hydrogen technology.** Indicative targets might be an alternative.

For battery electric trucks, the minimum power output levels of 350 kW are a good start for trucks with a high number of stops and longer legal breaks but might not be sufficient in case of breaks close to the legal minimum.



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Higher minimum levels of power output (>500 kW) might be considered in the AFIR.

Based on the length of the TEN-T network and the number of urban nodes and safe and secure parking areas, a **higher minimum requirement of charging stations** for each safe and secure (overnight) parking area dedicated to heavy-duty vehicles **might be considered**.

Lack of investment security as well as a lack of a stable long-term policy framework and of a targeted, uniform approach are hampering the accelerated roll-out and increasing realisation times of infrastructure.

Furthermore, policy makers can contribute to the development of infrastructure for trucks by removing barriers in the following ways:

- There is only limited time for testing and revision of national policies and revision of the AFIR before 2030. One option would be to **speed up the development of national policy frameworks**;
- **Provide sufficient support to local authorities** (financially, but also in terms of knowledge and organisationally), since much of the progress will depend on procurement procedures;
- In terms of grid capacities, **Member States should ensure that sufficient grid capacity is available for**

deployment of fast charging stations, as fast charging is important to reduce both recharging times and other operational barriers.

Grid developments should be taken into account in the Trans-European Networks for Energy (TEN-E) Regulation revision and are also partly addressed in the AFIR;

- Grid impacts of 'Fit for 55' policy proposals should be further investigated, including cost projections for grid adjustment (in addition to those for recharging and refuelling points) and the impact of additional renewable energy.

Key areas for EU action

1. Ensure sufficient power output is deployed for fast-charging, to achieve sufficiently short recharging times and reduce operational barriers.
2. Consider indicative rather than binding targets for liquid hydrogen, given the early phase of development of liquid hydrogen technology.
3. Consider higher minimum requirement of charging stations for each safe and secure (overnight) parking area dedicated to heavy duty vehicles.
4. Further investigate the grid impacts of the additional power production implied by the 'Fit for 55' policy proposals.
5. Speed up the development of national policy frameworks.
6. Provide sufficient support to local authorities financially, but also in terms of knowledge and organisationally.

Figure: TEN-T core network corridors



Source: (EC, 2021b)

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Publication: November 2021. © Image on page 1 used under the licence from Adobe Stock

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