

Alternative fuel infrastructures for heavy-duty vehicles



See the full study

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. It is therefore essential that there is sufficient and widespread recharging and refuelling infrastructure available.

Main observations

For trucks the Alternative Fuels Infrastructure Directive (AFID) is geared mainly to alternative fuels like Compressed Natural Gas (CNG) and Liquefied Natural Gas (LNG). Given the Green Deal decarbonisation target, the AFID should shift its focus to creating refuelling infrastructure for battery electric trucks (BET) and hydrogen fuelling infrastructure. Electric road systems (ERS) could be further piloted on specific corridors.

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. It will be followed by the publication of a full study.

At present there is only minimal publicly accessible refuelling and recharging infrastructure for BETs and hydrogen-fuelled trucks. Chargers up to 350 kW have been piloted, while chargers up to 1 MW are being developed to limit charging times. A limited number of hydrogen refuelling stations for passengers' cars and buses are already in operation. Accessibility for trucks seems very limited and needs attention with respect to size, spatial integration, compatibility of tank pressure and location choice.

Estimated future infrastructure requirements point to a need for overnight depot charging points as the main recharging concept for BETs. 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 infrastructure is essential and needs to be addressed via Trans-European Transport Network (TEN-T) and the AFID.

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 prepared and made future-proof. These developments should be taken into account in the TEN-E revision.

Although action is required in the short term, lack of investment security, a stable long-term policy framework and a targeted, uniform approach are hampering accelerated roll-out and increasing realisation times. Policymakers need to take suitable policy initiatives.



Conclusions and policy recommendation

This research highlights the necessary contributions to the development of infrastructure for trucks by removing barriers by means of:

- an increase in investment security for investors by creating a stable policy framework (such as binding targets) and via smart funding mechanisms;
- a reduction in lead times by removing any disproportionate permit requirements given the size and scale of recharging and refuelling infrastructure;
- a reduction of long procedures and lead times for appropriate grid connections and adjustments to ensure sufficient capacity;



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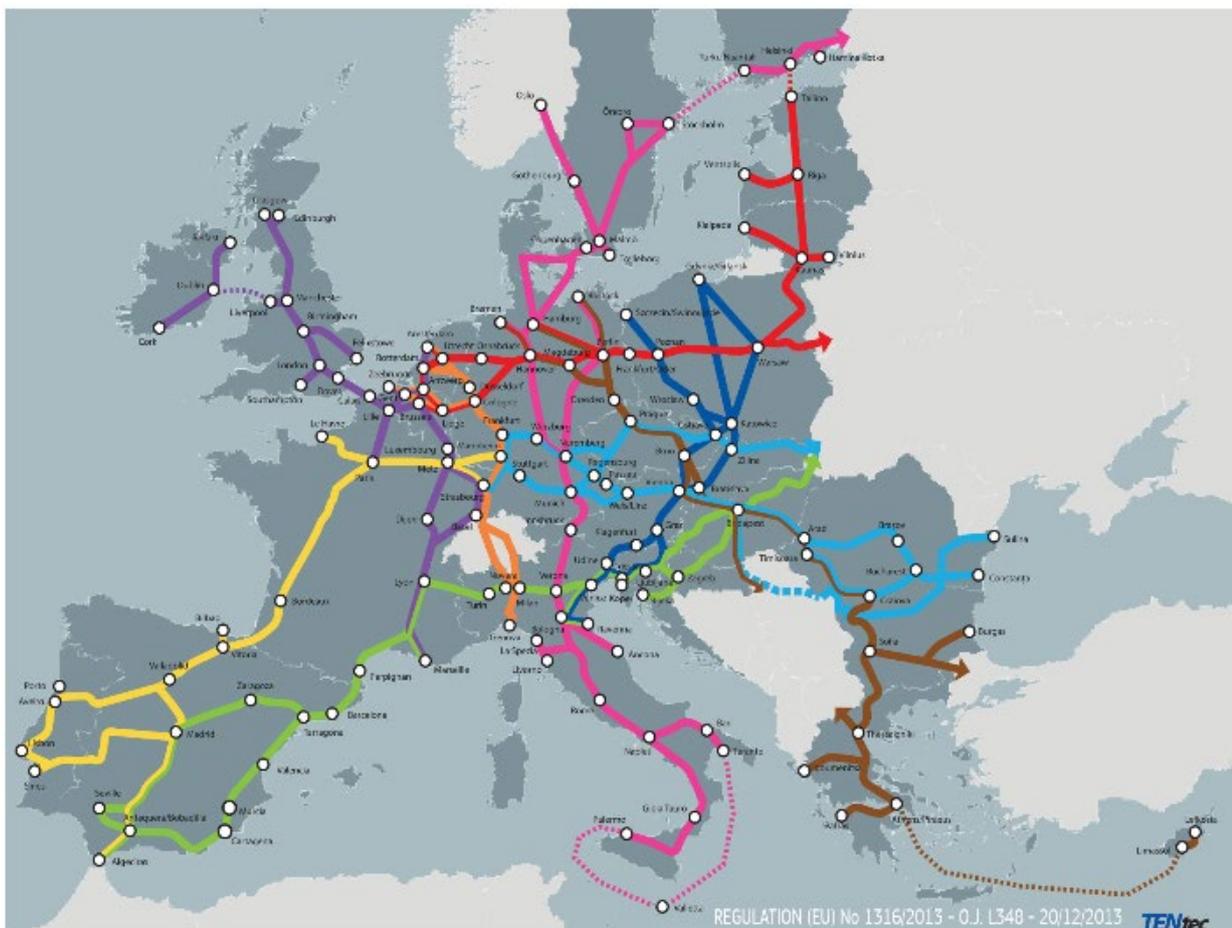
- bringing stakeholders together in a coordinated approach in which small and medium-sized enterprises can also benefit from scale advantages and particular attention is paid to the role of grid operators and other stakeholders in the energy sector;
- seeking synergies and smart solutions to maximise utilisation rates;
- development of information and reservation systems to improve accessibility and to reduce uncertainties related to availability, mainly for shared public infrastructure;
- striving for standardisation and harmonisation from the outset, especially for the vehicle-infrastructure interface;
- ensuring all Member States are on board, not only frontrunners;

Key areas for EU action

1. An increase in investment security for investors.
2. A reduction in lead times by removing any disproportionate permit requirements.
3. A reduction of long procedures and lead times.
4. Bringing stakeholders together in a coordinated approach.
5. Seeking synergies and smart solutions.
6. Development of information and reservation systems.
7. Striving for standardisation and harmonisation.
8. Ensuring all EU Member States are on board.
9. Decarbonisation potential of renewable fuels (biofuels and e-fuels) in diesel engines should not be overlooked.

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Figure: Trans-European Transport Network (TEN-T) core network corridors



Source: (EC, 2021b).

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