



Hydrogen
Europe

Scaling up hydrogen in road transport

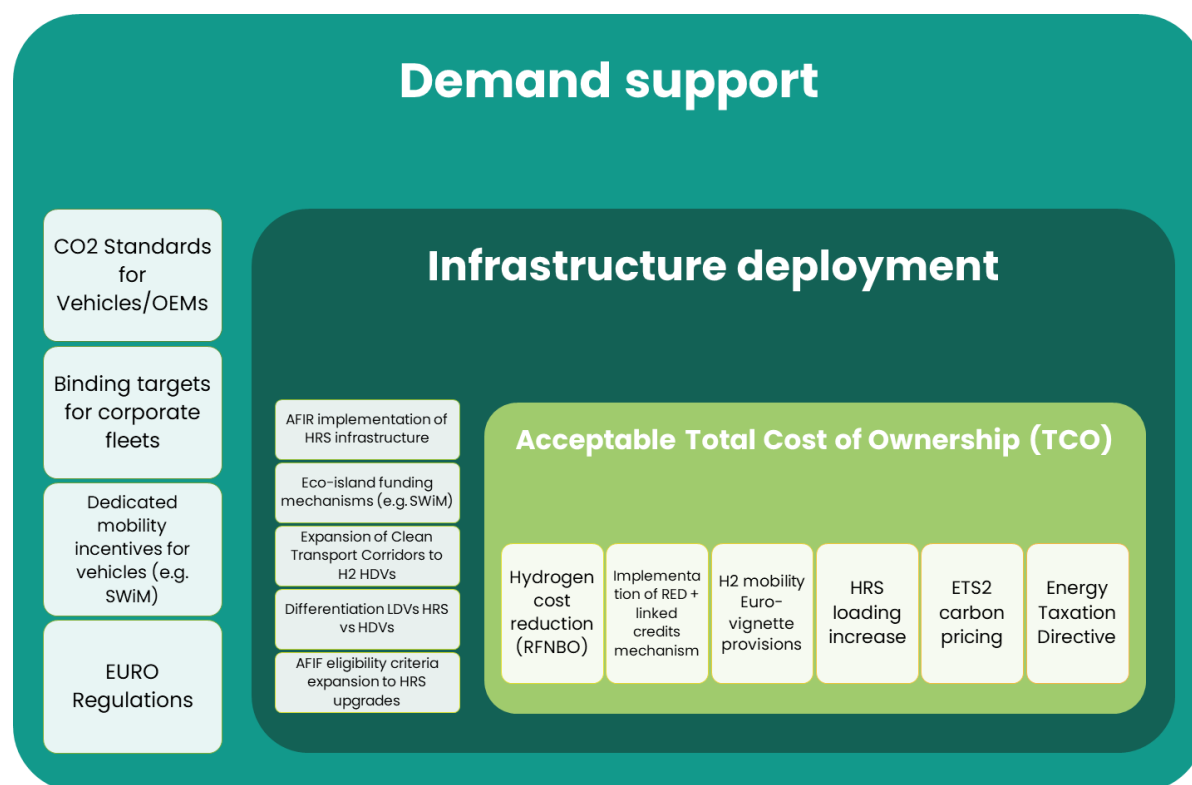
Hydrogen Europe position paper

December 2025

Table of contents

1.	Introduction	2
2.	CO2 Standards for Light Duty Vehicles.....	5
2.1	Align ambition and competitiveness	5
2.2	Hydrogen combustion engines and the role of e-fuels	5
2.3	Progress report.....	6
3.	Clean Corporate Fleets.....	6
4.	Enabling conditions	7
4.1	Fast, uniform deployment of EU HRS network in line with AFIR targets	7
4.2	Pragmatic approach on hydrogen imports and production	8
4.3	Need for consistent messaging from EU institutions	8
4.4	Create viable ecosystems by implementing and updating flanking legislation	8

Overview of existing and required H2 mobility policies



1. Introduction

Decarbonisation of road transport will only be achieved if the potential of hydrogen and its derivatives is fully exploited. Yet, market activation efforts in Europe have so far failed, leaving Europe lagging behind its own targets and Asian competitors. Yet, Europe holds technological know-how. Hydrogen contributes to securing Europe's industrial base and facilitates diversification efforts: vehicles running on fuel cells (FC) and hydrogen combustion engines (H2ICE) can be made in Europe without excessively relying on rare earths import and batteries from China. The industry can secure supplies in and around the continent, enhancing energy independence. Complementing battery electric solutions, hydrogen vehicles are well suited for intensive use, long range and high payload capacity, which all require significant power output.

Appropriate infrastructure will reduce overall costs, increasing Europe's energy independence and speeding up the decarbonisation of the sector.¹ The creation of hydrogen ecosystems will relieve stress from electricity grids already under strain in countries like The Netherlands.² **Ecosystems growing around local hydrogen refuelling stations (HRS) networks create momentum by bringing together decarbonised end uses, from industrial to mobility applications.** Hydrogen-powered heavy-duty vehicles (HDVs) play a strategic role: the rapid reduction of hydrogen costs and of HRS operating costs both heavily depend on its load factor. In the current market activation phase until 2030, public financial support remains crucial. After 2030, when hydrogen HDVs reach mass production, economies of scale will lower the need for public funding. Until then, it is imperative to deploy the HRS network in a way that avoids early dispersion of investment, leading to underused assets.

Upcoming EU legislative initiatives provide the opportunity for a holistic take to road transport policy issues. With proposals closely interlinked, Hydrogen Europe members call for a systemic approach to these legislations. **Creating the right enabling conditions would secure Europe's industrial competitiveness and technological leadership and allow a faster transition to zero emission transport.** Policymakers must continue to honour their commitments to AFIR targets and CO₂ emission standards. Uncertainty deters investment across the value chain. Prior to any new initiatives, the implementation of this regulatory framework to stimulate demand for zero-emission mobility should be prioritized.

The AFIR and Renewable Energy Directive, mandating the installation of an EU-wide HRS network and the supply of a minimum of 1% RFNBO to the transport sector will be key enabling factors, alongside the proper implementation of the RED credits mechanism.³ **Timely HRS deployment is crucial for the entire hydrogen value chain:** they represent the connection between supply and demand. As mobility, and especially commercial transport, is primarily driven by total cost of ownership (TCO), a crucial goal is to reduce costs, starting with the price at the pump, currently high due to high HRS operation costs. In turn, OPEX costs depend on the station's load factor, which should be maximised with dedicated measures presented in this paper.

Mobility, and particularly commercial road transport, is considered as having the highest willingness to pay and cover the extra cost of new technologies. Tailored support would ensure the decarbonisation of the sector, with benefits for industries and competitiveness beyond mobility.

¹ Clean Hydrogen Partnership, "[The Road to Net Zero](#)", 2023

² IEA, "[Grid Congestion Is Posing Challenges for Energy Security and Transitions](#)", March 2025

³ Whereas the Directive's 'refinery route' appears the cheaper compliance option, it is not without challenges. Fuels suppliers might therefore have to deliver fuel to the market under the transport target. Further recommendations on how to tackle the difficulties of the REDIII implementation in transport can be found here: Hydrogen Europe, "[Guidance on REDIII Implementation in the Transport Sector](#)" June 2025

Key recommendations

Topic	Recommendation	Nature	Who
CO2 Standards LDVs	Focus on publicly accessible HRS. Differentiate between HRS for LDVs and HDVs. The latter should not be considered when assessing deployment progress for the LDV sector.	Progress report	European Commission
	Work on clear criteria to certify and account the carbon neutrality of e-fuels to ensure their long-term contribution.	Role of e-fuels	European Commission
	Incorporate UN Reg 154 into EURO Regulations to grant H2ICE the zero-emission status.	H2ICE	European Commission, UNECE
Clean Corporate Fleets	Differentiate between LDVs and HDVs	Scope	European Commission
	Set binding targets for HDVs, alongside additional support measures.	Targets	European Commission
	Put support measures at the centre of the proposal, to make zero emission vehicles more attractive (e.g. pan-European fiscal measures to incentivise uptake).	Funding	European Commission
Enabling conditions	Recognize hydrogen mobility as an integral part of the decarbonization strategy by making it part of the Plan. Reinforce the hydrogen mobility industry and build public trust.	Automotive Action Plan	European Commission, Member States
	Expand the Clean Transport Corridors initiative to hydrogen HDVs.	Automotive Action Plan	European Commission
	Swift deployment of HRS for LDVs and HDVs in line with AFIR obligations. Expand the targets in the upcoming AFIR review to sustain growth.	AFIR	European Commission, Member States
	Implement EU-wide zero tax rate for hydrogen used as a fuel in road transport, regardless of the powertrain used (fuel cell or hydrogen combustion).	Energy Taxation Directive	European Commission, Member States
	Set a carbon price for transport in Europe.	ETS 2	European Commission, Member States

Design funding programmes following the principles of the Dutch SWiM programme.	Funding	European Commission, Member States, local authorities
Expand the AFIF eligibility criteria to cover upgrades of existing HRS.	AFIF	European Commission
Fast and uniform implementation of favourable road toll charging for zero emission vehicles.	Eurovignette	Member States
Align the definition of clean vehicles to those of “zero-emission vehicle” set in the CO2 Standards regulations.	Clean Vehicles Directive	European Commission, Member States
Reach agreement and implement content at national level without delay.	Weights and Dimensions Directive	EU, Member States

2. CO2 Standards for Light Duty Vehicles

4.1 Align ambition and competitiveness

While **Hydrogen Europe supports efforts to decarbonise the transport sector**, at a time when European industries, especially the automotive industry and the wider supply chain, are under pressure, **it also calls on EU institutions and Member States not to lose sight of industry competitiveness**. The continent still holds the technological edge on hydrogen but competitors are catching up fast.

For this reason, **timely implementation of AFIR HRS targets, transposition of RED hydrogen quotas into national law and, overall, the creation of a supportive framework are of utmost importance. We call on Member States to do so without delay, as availability of supply is essential to drive up demand for hydrogen mobility.**

4.2 Hydrogen combustion engines and the role of e-fuels

To put an end to the confusion as to what constitutes eligible zero emission technologies, Hydrogen Europe calls on the European Commission to press for an agreement on amendments to Regulation 154 and integrate the results into EU law. Whilst fuel cells and H2ICE technologies are fully eligible to meet emission reduction targets until 2035, adaptations are needed to permanently inscribe H2ICE as zero emission into existing EU legislation post-2035.⁴ This is a necessary precondition to ensure we in Europe employ the full array of technologies at our disposal to decarbonise road transport.

In addition, Hydrogen Europe welcomes the Commission intention to assess the role of e-fuels, that have the potential to reduce overall emissions from combustion engines, and by doing so, increase the demand for hydrogen-based technologies in the road transport sector in the long term. For that to happen, clear criteria to certify those fuels are truly carbon neutral should be set. Clarifications on

⁴ Amendments to Regulation 154 are being negotiated. Once adopted, they will certify H2ICE to be zero emission. Then, they need to be integrated into existing EU legislation (including EURO Regulations), which will make H2ICE the third zero emission technology along with batteries and fuel cells after 2035.

the sustainability attributes and implications of possible blending with conventional fuels in the tank will also require in-depth analysis.

However, the actual extent of their contribution remains uncertain as they currently face high costs, limited availability and regulatory preferences privileging their use in hard-to-electrify transport modes. **Therefore, short-term scale up of hydrogen mobility will rely priority on fuel cells and H2ICE.**

4.3 Progress report

By 31 December 2025, the Commission is mandated to submit a progress report that assesses the need for additional measures to facilitate the transition. Such report will investigate the effectiveness of existing financial measures and the rollout of hydrogen refuelling infrastructure (HRS), including progress made under the Alternative Fuels Infrastructure Regulation (AFIR). **Hydrogen Europe invites policymakers to avoid repeating the oversights of the recent 'AFIR Market Readiness Report'⁵ and only consider HRS designed to serve light duty vehicles.**

An update of the financial support measures to speed up the uptake of hydrogen vehicles and HRS to allow the market to reach scale is also long overdue. Proposals will be discussed in the sections below.

3. Clean Corporate Fleets

The upcoming proposal on corporate fleets represents a significant lever to encourage fleet decarbonisation. Both push and pull measures will be needed to facilitate the energy transition of road transport. Hydrogen Europe recognizes the relevance of regulatory intervention to address some of the current failures in the deployment.

Considering the use profile of corporate vehicles, **the proposal should clearly recognize hydrogen mobility as part of the decarbonization strategy of the transport sector and serve as a tool to strengthen the European hydrogen mobility industry.**

Due to the complexity of markets and the large discrepancies in the user profiles, Hydrogen Europe recommends having **separate rules for LDVs and HDVs, replicating the approach used with CO2 Standards regulations. A one-size-fits-all approach for all fleet types would not work, as LDV and HDV fleets have distinct needs. Commercial** road transport is a business-to-business environment with various type of stakeholders – it's a fragmented market driven by TCO. Tailored mechanisms to pull the market are needed to create the necessary demand for zero emission HDVs. **We propose that targets are set for shippers and are based on a growing share of goods moved by zero emission vehicles, using tonne-kilometres as metric.** Over time, more and more goods would have to be transported by zero emission HDVs. With targets and accompanying support schemes in place (starting with purchase incentives), shippers would be encouraged to renew their fleet which, in turn, would force vehicle OEMs to ramp up production. New support schemes should consider the specificities of the commercial road transport industry, where many companies are small and family-owned.

Enabling conditions, discussed in more in detail in the following sections, must also be part of the core of the proposal. The main goal should be to make hydrogen vehicles more attractive for organizations and on reducing the TCO. The European Commission should support the uptake of hydrogen refuelling infrastructure in key locations for corporate fleets such as ports, hubs and depots. HRS at airports could serve both the ground handling fleet on the private side and commercial vehicles on the public side,⁶ thus guaranteeing the necessary volume to drive costs down for everyone.

⁵ Hydrogen Europe, "[Reaction to the AFIR Market Readiness Report](#)", July 2025

⁶ Rotterdam the Hague Airport, "[Fountain Fuel Bouwt Waterstoftankstation op het Terrein van Rotterdam The Hague Airport](#)", December 2024

Creating synergies should be the basic principle of the proposal. Solely relying on mandates and penalties, or solely relying on subsidies might both be short-lived solutions, as recent experiences have shown. Mandates would create additional burden for cost-sensitive companies, and subsidies would make companies dependent on their existence.

The European Commission should also bring forward concrete proposals on taxation and the overall financial cost related to adopting zero-emission vehicles with a view to encouraging, rather than obliging, operators. **Reducing TCO and deploying HRS are urgent priorities.** We call on the Commission to **expand and harmonise fiscal measures by promoting EU-wide rules to support deployment**⁷ at local level. For example, reducing or scrapping vehicle tax for hydrogen vehicles could be a step in the right direction; available literature proposes different mechanisms to reduce the cost gap between zero emission and conventional vehicles.^{8,9}

In the HDV sector, this also includes extending toll exemptions for hydrogen vehicles which reduce operational costs for operators and owners of truck fleets, e.g. via the Eurovignette Directive. **We welcome the Commission intention to extend toll exemptions for zero emission HDVs until 30 June 2031**¹⁰ and we call on Member States to adopt the proposal without delay.

Lastly, **support should address not only purchase subsidies (for LDVs and HDVs) but also targeted support for the deployment of HRS, ideally applying the successful principle of the Dutch SWiM scheme.**¹¹ Reducing the cost gap with conventional HDVs would be a win-win situation that stimulates the demand for zero emission HDVs, including those made in Europe.

4. Enabling conditions

4.1 Fast, uniform deployment of EU HRS network in line with AFIR targets

Much of the above will only happen if everything else is in place. **The fundamental prerequisite of a transition to zero emission mobility is the availability of hydrogen refuelling infrastructure.**

Time is running out fast. AFIR targets are a good start but now need to be implemented and increased, if need be. As we recently showed, the refuelling infrastructure for HDVs running at 700bar, which is what Article 6 mandates, is close to non-existent in Europe¹². Other solutions score better but the network is underdeveloped for the expected demand in key EU Member States in the coming years and decades, as a recent study clearly shows.¹³ AFIR network has always been intended to provide the bare minimum, **we urge the Commission and Member States to speed up deployment to meet 2027 and 2030 targets. The Commission should also look at how to restructure the existing legislative and funding framework to make sure deployment happens as fast as possible.** A widespread HRS network is a *sine qua non* condition for mass production of hydrogen vehicles. To ensure AFIR effectively supports a robust hydrogen infrastructure, the review scheduled for late 2026 must be leveraged. It will be critical for recalibrating and significantly strengthening existing targets, specifically by increasing the minimum targets, if needed, and extending the coverage beyond the current

⁷ Hydrogen Europe, "[Funding for Hydrogen in Mobility](#)", November 2024

⁸ Ricardo, ECTA, "[Study on Financing Mechanisms for Zero-Emission Trucks and Their Infrastructure](#)", March 2024

⁹ Hy24, "[Enabling CO2 Standards – A Policy Toolkit to Foster the Implementation of AFIR in European Member States](#)", October 2023

¹⁰ European Commission, "[Commission Proposes Toll Exemptions To Boost Demand for Zero-Emission Lorries and Buses](#)", June 2025

¹¹ RVO, "[Subsidierregeling Waterstof in Mobiliteit \(SWiM\)](#)"

¹² Ibidem.

¹³ Löfving, Brynolf, Grahn, "[Geospatial Distribution of Hydrogen Demand and Refueling Infrastructure for Long-Haul Trucks in Europe](#)", International Journal of Hydrogen Energy, May 2025

European core network to encompass the entire TEN-T network. Moreover, AFIR targets should be expanded and aligned with those set in CO2 Standards Regulations to ensure the network keeps growing beyond 2030.

4.2 Pragmatic approach on hydrogen imports and production

Hydrogen mobility represents a crucial component in the transition to sustainable transport, yet its potential remains largely untapped due to regulatory barriers. Instead, of overly restrictive criteria for the production and import of hydrogen, as set out in the delegated acts on renewable fuels of non-biological origin (RFNBOs – Delegated Regulation 2023/1184 and 2023/1185), the EU needs a pragmatic approach to facilitate the widespread adoption of hydrogen as a clean fuel source.

A clear and supportive regulatory framework is required to encourage the production, distribution, and utilisation of hydrogen, and foster the development of hydrogen mobility.

4.3 Need for consistent messaging from EU institutions

The Commission should also work to improve the general public's perception of zero emission vehicles, notably hydrogen-powered ones. Hydrogen Europe also calls for Commission bodies to speak with one voice and reiterate once for all the support for hydrogen in road transport. Whereas this is not an enabling condition *per se*, constantly dealing with mixed signals from different initiatives and DGs undermines the confidence of the industry and end users. A recent study focused on life cycle assessment (LCA) of greenhouse gas emissions clearly shows **fuel cell cars have the lowest emissions (79% lower than petrol engines) when powered by renewable hydrogen**.¹⁴ Hydrogen Europe has suggested multiple times the benefits of switching to LCA to put batteries and hydrogen on more equal footing; this should be considered in the long term. **The Commission should acknowledge the decarbonisation potential of hydrogen vehicles and work to facilitate its ramp up in the transport sector.**

However, **we regret that the recent Automotive Action Plan leaves little to no support for hydrogen.** What could be a great opportunity to showcase hydrogen technologies in real life operations is the proposal on Clean Transport Corridors, where zero emission trucks would run commercial operations on selected corridors equipped with the necessary infrastructure. However, we are disappointed to see the scope is only targeted at battery electric trucks. It would be a rather low hanging fruit to (a) support Member States in meeting AFIR targets, (b) creating volumes, thus reducing costs and facilitating scale up and (c) creating a spillover effect by generating local hydrogen ecosystems along the selected corridors.

4.4 Create viable ecosystems by implementing and updating flanking legislation

Additional work is needed. If on the one side work is needed to bring cheap hydrogen to the market, on the other hand more should be done to make the use of fossil fuels more expensive. In this respect, the ETS2 is a good starting point and should not be weakened.

On the funding side, the principles of the Dutch Subsidy for Hydrogen in Mobility (SWiM¹⁵) should be widely replicated by authorities at all levels. The program mandates the creation of consortia of HRS operators and vehicle providers. This approach helps the creation of local hydrogen ecosystems,

¹⁴ ICCT, "[Life-Cycle Greenhouse Gas Emissions From Passenger Cars in the European Union](#)", July 2025

¹⁵ RVO, "[Subsidieregeling Waterstof in Mobiliteit \(SWiM\)](#)"

improving coordination between both sectors and derisking HRS investments by securing a minimum loading rate. Unsurprisingly, budget has been raised from 28 to 40 million Euros to cope with exceptional demand from end users.¹⁶ Developments at national level should go hand in hand with an updated and reinforced Alternative Fuels Infrastructure Facility (AFIF), whose eligibility criteria should be expanded to cover upgrades for existing HRS to become AFIR compliant.¹⁷ If the goal is to provide a minimum network able to sustain scale up of hydrogen mobility, there is no reason to overlook the potential of the existing network.

At EU level, we regret to see the revision of the Weights and Dimensions Directive being stuck at Council level. Decarbonisation of transport should not come at the expense of payload, so **we call on Member States to swiftly agree on a general approach that grants increased limits for zero emission HDVs to account for the extra weight and length needed for hydrogen powertrains**¹⁸ (fuel cell, H2ICE and dual fuel engines). The trialogue agreement should then be followed promptly by implementation at national level.

On top of that, **incentives, purchase support for vehicles and OPEX for HRS,¹⁹ equal taxation for hydrogen used in fuel cell and hydrogen combustion engines will all contribute to market development** and to create viable ecosystems, the best way to make the market grow organically.

Lastly, positive spillover effects could be created by intervening in other areas of the value chain with demand-inducing measures, like public and/or private procurement but also voluntary initiatives, partnerships with large corporate buyers, and a system of sticks and carrots downstream in the value chain can create meaningful market signals and help establish functioning lead markets, to the benefit of the entire hydrogen industry.²⁰

¹⁶ Ibidem.

¹⁷ Further recommendations on how to improve CEF-T / AFIF can be found in: Hydrogen Europe, "[CEF 2021-2027 Interim Evaluation Consultation](#)", May 2025

¹⁸ Hydrogen Europe, "[Position Paper - Weights and Dimensions Directive](#)", June 2023

¹⁹ Hydrogen Europe, "[Funding for Hydrogen in Mobility](#)", November 2024

²⁰ Hydrogen Europe, "[The Case of Green Lead Markets: Ensuring Competitiveness, Energy Security and Decarbonisation](#)", July 2025

•
HYDROGEN EUROPE
Avenue Marnix 23
1000, Brussels / Belgium

secretariat@hydrogeneurope.eu
www.hydrogeneurope.eu



Hydrogen
Europe