

Policy Support Required in Ireland

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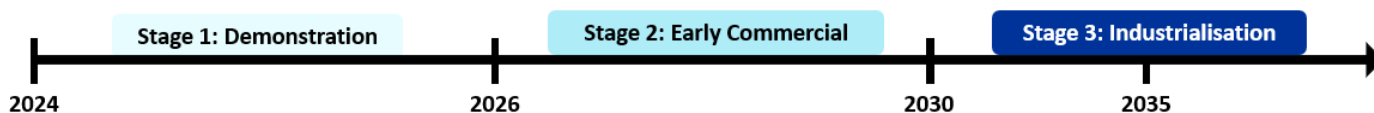


Introduction

In 'The Need For and Vision Of Hydrogen Mobility in Ireland', Hydrogen Mobility Ireland (HMI) determined that 700MW of hydrogen production capacity is required to satisfy EU mobility mandates by 2035. In its second paper on 'The Collective Ambitions of HMI members', HMI established a set of Demonstration, Early Commercial, and Full Industrial-scale projects its members are willing to deliver with the correct level of policy support, showing a clear roadmap to the delivery of 700MW of electrolysis by 2035 and the industrialisation of hydrogen mobility.¹

Support from Government will be required to kick-start the Irish hydrogen mobility sector, however, the Irish Government does not need to provide this in isolation. Ireland has access to a number of large-scale EU funding schemes, presenting a significant opportunity for the uptake of hydrogen. However, EU funding is highly competitive, and is typically accessed by projects in countries with abundant renewable resources and/or existing policy support to subsidise the cost of producing renewable hydrogen or create a willingness to pay from end users. Ireland has access to abundant wind power, but currently lacks the policy support which will allow projects to access EU funding and enable the development of hydrogen mobility in Ireland.

This paper from Hydrogen Mobility Ireland provides a clear overview of the support needed to activate the hydrogen mobility market in Ireland, the available EU funding for hydrogen mobility in Ireland, and where national policy support can enable companies in Ireland to access EU funding and achieve their decarbonisation goals.



Demonstration Stage: Implement an 'Early Hydrogen Innovation Fund' to support capital costs for small-scale projects

Demonstration projects are necessary for Ireland to acquire the skills and expertise to deploy commercial-scale hydrogen mobility, and activate the market for later expansion. Early-stage hydrogen projects require high levels of support from Government due to their inability to compete with well-established fossil alternatives. Demonstration projects will be small scale, meaning support can be provided at low cost to Government. For this stage of deployment, HMI considers that capital grant funding for specific hydrogen projects, which is able to cover the entire value chain, is the fastest and simplest way to deploy nascent technologies and gain experience across a wide variety of sectors.

Existing EU funding: Small-scale Innovation Fund calls support up to 60% of a small project's eligible costs (project size: capex between €2.5M and €20M), in the areas of renewable energy, decarbonisation of energy-intensive industries, and carbon capture, use, and storage.

Gaps in funding: The small-scale Innovation Fund is highly competitive, with fewer than 1 in 4 projects selected for grant agreements in the most recent call. To deliver demonstration projects in a timely manner, Hydrogen Mobility Ireland recommends the implementation of national funding that provides

¹ See 'Collective Ambitions of HMI Members'

capital grants to cover 100% of the capex difference between early hydrogen production and offtake projects and fossil alternatives. HMI suggests this should be the role of the 'Early Hydrogen Innovation Fund' that is to be implemented between 2023 and 2027 as an action of the [Irish Hydrogen Strategy](#).

HMI considers that the implementation of this fund is a crucial first step to the industrialisation of hydrogen in Ireland – attracting investors, ensuring Ireland develops home-grown hydrogen expertise, and allowing the economic benefits of developing a hydrogen mobility ecosystem to be retained.

In addition to providing capital funding to Demonstration projects, **long-term clarity on funding and policy support mechanisms and levels is essential to enable investment into hydrogen projects**. Uncertainty on Government support will significantly impede the development of Early Commercial projects – crucial to the industrialisation of hydrogen mobility.

Early Commercial Stage: Implement funding of vehicles linked to Hydrogen Refuelling Stations (HRS), funding of maritime conversions to e-fuel compatible engines, and policy support to reduce the cost of renewable hydrogen

Early Commercial projects will deploy hydrogen production and use in mobility at the 10MW+ scale. Deploying projects at this scale will demonstrate the availability of renewable hydrogen – bringing confidence on the ability for RFNBOs to be produced at scale in Ireland and enable the country to attain policy targets. Projects in the Early Commercial phase will require policy support across the entire hydrogen value chain – at this stage, the cost of renewable hydrogen will be substantially higher than fossil fuels, and the volume of hydrogen sold will be such that capital subsidies alone are not able to create a business case.²

Existing EU funding is almost exclusively capex-based, with limited availability of opex support. National opex support will allow Irish hydrogen production projects to access the large sums of capex support available from EU funding by creating viable business cases for these projects.

National opex policy support to reduce the cost of renewable hydrogen is key to allow the deployment of Early Commercial projects. Hydrogen Mobility Ireland considers that the following two mechanisms could be used to provide effective opex support:

- **Contract for Difference (CfD) schemes** are contracts between a funding body and a renewable hydrogen producer, where the funding body pays the producer the difference between a fixed 'strike price' and a reference price. In the UK's Hydrogen Allocation Round CfD scheme, the reference price is based on the price of natural gas, and strike price is determined such as to ensure the project's business case is viable. The UK scheme aims to support up to 2.5GW of electrolysis capacity across the first four rounds (applications closing 2023 - 2027)³. The Dutch OWE scheme similarly provides projects with a CfD and is providing a subsidy of up to €1,250M across the first two rounds (applications closing 2023-24)⁴. These schemes benefit projects by ensuring hydrogen can be sold at a competitive price to end users, and providing long-term clarity on the level of support, allowing final investment decisions to be taken by project developers.

² Operational cost support is crucial to create a viable business case for Early Commercial projects. According to [Hydrogen Europe](#), electricity including grid fees constitute 66% of the cost of hydrogen production (low-temperature electrolysis), with capex accounting for 34% of costs.

³ ['Hydrogen Allocation Rounds'](#), UK Govt, accessed 28.10.24

⁴ ['Subsidy scheme for large-scale hydrogen production using an electrolyser \(OWE\)'](#), NL Govt, accessed 28.10.24

- **Renewable Transport Fuel Credits (RTFCs).** RTFCs can be used to set an obligation for the production of various renewable fuels by fuel suppliers. The obligation can be met by redeeming credits for the relevant fuel or by paying a fixed sum per litre of fuel for which the fuel supplier wishes to ‘buy-out’ of their obligation. RTFCs create an avoided cost / additional revenue stream for the producers of renewable fuels, allowing fuels to be sold at an acceptable price to end-users (comparable to fossil equivalents). However, there is a risk of market over-saturation, which means that credit mechanisms provide less long-term business case certainty than CfDs (which may be preferable in the short term).

CfD schemes and RTFCs can bolster the business case for Early Commercial hydrogen projects by ensuring hydrogen is supplied at an acceptable price. This will allow projects to access capital funding from EU sources, including:

- **CEF AFIF⁵ funding for Hydrogen Refuelling Stations (HRS)**
The European [CEF AFIF](#) funding call supports 30% of capex for the deployment of alternative fuels supply infrastructure along the Trans-European Transport Network (TEN-T) – including hydrogen refuelling infrastructure and ammonia and methanol bunkering infrastructure.

Gaps in funding and required national support: CEF AFIF does not include funding for end-users, creating challenges accessing sufficient offtake. To enable industry to take advantage of this funding, HMI recommends that the Irish government:

- **Provides national grant funding for hydrogen vehicles linked to HRS** to allow the Irish hydrogen industry to benefit from CEF AFIF funding for HRS.
- **Provides national grant funding to retrofit vessels with ammonia / methanol-ready engines** will allow ship fuelling with renewable fuels and subsidies from CEF for bunker vessels.

Case study - Dutch SWIM call: Consortia of fleet operators and hydrogen infrastructure developers can access funding of up to 40% of HRS capex and 80% of the difference in cost between hydrogen- and diesel-powered trucks. This joint funding of HRS and vehicles resolves the supply / demand issue and derisks the HRS business case.

- **Hydrogen Valley funding**
The EU’s [Hydrogen Valley](#) funding supports 70% of eligible capex for hydrogen production, offtake, storage, and transport in a geographically defined area. €20M of funding is available for large-scale Hydrogen Valleys producing over 4000 tonnes of hydrogen per year (approximately equivalent to a 36MW electrolyser⁶). €9M is available for small-scale hydrogen valleys producing over 500 tonnes of hydrogen per year (approximately equivalent to a 5MW electrolyser⁶).
- Gaps in funding and required national support:** Hydrogen Valleys are an effective funding mechanism as they provide support across the entire hydrogen value chain. However, no opex support is provided, which could be resolved through the implementation of a CfD or RTFCs.

⁵ Connecting Europe Facility Alternative Fuels Infrastructure Facility

⁶ Assuming 55kWh/kg-H₂ electrolyser efficiency and 70% electrolyser load factor

- **Innovation Fund**

The [Innovation Fund](#) is one of the EU's most generous funding schemes for innovative technologies and flagship projects that can bring about significant emissions reductions. The programme funds up to 60% of eligible project capex, with an average grant award from the 2023 call of €56M.

Gaps in funding and required national support: The Innovation Fund is highly competitive, with fewer than 1 in 4 projects receiving funding in the 2023 Innovation Fund call. Additionally, the scale of project for the large-scale call can be prohibitive, with the call aiming to support large-scale, first of a kind commercial projects. HMI expects that the Innovation Fund can be used to support the transition from Early Commercial projects to Industrial scale projects – such as for the construction of a large-scale e-fuel production facility. To enable the use of large-scale Innovation Fund grants, HMI recommends that:

- **Ireland implements the Early Hydrogen Innovation Fund** to ensure that the necessary expertise and experience is built up at a smaller scale, allowing businesses to commit to projects of increasing scale.
- **Demand is created in Ireland for e-fuels** through long-term commitment to e-fuel mandates and an RTFC scheme.

- **European Hydrogen Bank (EHB)**

The EHB is currently the EU's only opex funding mechanism for hydrogen production. The auction is highly competitive, resulting in support ranging between €0.37 to €0.48 per kg of hydrogen produced in the first auction in 2024. Successful projects from the first hydrogen bank auction are located in Iberia and Scandinavia, regions with low cost of renewable energy, and projects demonstrated that end users were willing to pay a premium for renewable hydrogen.⁷

Gaps in funding: To access funding from the EHB, projects must have access to low-cost renewable energy, and complementary policies allowing projects to be viable with subsidies as low as €0.50/kg from the EHB. To allow Irish projects to be competitive for this funding, HMI recommend implementing support to create demand for RFNBOs with a price premium above the equivalent fossil products will allow Irish projects to access EHB funding.

Hydrogen Mobility Ireland considers that the introduction of a national opex support mechanism is the most important step to creating a viable business case for hydrogen production projects, ensuring these projects can benefit from additional EU funding.

Industrialisation Stage: Implement policies creating cost parity between fossil fuels and hydrogen mobility

During the industrialisation phase, estimated to take place from 2030 onwards, Ireland will deploy 100MW+ scale hydrogen production. At this stage, sustainable growth of the Irish hydrogen mobility ecosystem will be driven by market demand based on cost parity (or better) between renewable fuels and fossil fuels. While achieving scaled deployment of hydrogen production and mid-stream infrastructure will reduce the cost of renewable hydrogen and derivatives, long-term policy support will be required to drive demand and deployment during this stage. This should include:

⁷ ['Clean Hydrogen Monitor 2023'](#) - Figure 3.8, Hydrogen Europe, 2023

- **Sufficiently high buy-out prices for Power to Liquid (PtL) SAF and RFNBO marine fuels:** The e-fuels⁸ used in the aviation and maritime sectors will require low capital costs for vehicle conversions compared to the road sector (as SAF is a drop-in fuel, there are no associated conversion costs). Therefore, only the production of e-fuels must be incentivised. This can be achieved through the introduction of an appropriate buy-out price for aviation and marine e-fuels under a RTFC mechanism.

Case study: The UK SAF Mandate will be implemented on 1st January 2025 and includes both a main obligation (allowing the use of biofuels) and a PtL obligation (SAF produced using RFNBO hydrogen). The UK SAF mandate provides an indicative buy-out price for PtL SAF of £5.00/litre of e-fuel. The obligation begins at 0.2% of aviation fuel in 2028, reaching 1.5% in 2035 and 3.5% in 2040. In comparison, ReFuelEU requires 5% of aviation fuel to be produced via PtL pathways by 2035 and 10% by 2040.

- **Implement policies creating TCO parity between diesel and hydrogen vehicles:** For road transport, using hydrogen directly in fuel cells or internal combustion engines requires the conversion of fleets to hydrogen-powered equivalents. This relies on TCO parity or better between fossil-fuelled and hydrogen vehicles, which can be achieved through a combination of measures including:
 - **Implement a RTFC system to support the cost of RFNBO hydrogen** (continued support from the Early Commercial phase).
 - **Implement policies reducing the cost of operation of hydrogen vehicles**, such as reduced road tolls for zero-emission vehicles, as required by the Eurovignette Directive.

As hydrogen mobility reaches full industrialisation in Ireland, costs of producing renewable hydrogen and thus policy support requirements will reduce, allowing the reduction of state expenditure. Ireland will have succeeded in creating a large-scale renewable energy industry, spanning generation to end-use, achieving the economic benefits, energy security, and emission reductions.

Conclusions

There are large volumes of EU funding available for Demonstration and Early Commercial hydrogen mobility projects. However, Ireland has largely not been able to take advantage of this funding due to a lack of additional funding and policy support from national government. HMI has provided a clear analysis of these gaps, and the national funding and policy support mechanisms which can complement EU funding to create a viable business case for hydrogen mobility projects. HMI has provided recommendations that will increase hydrogen mobility projects' competitiveness and allow them to access EU funding – enabling the scale-up of hydrogen mobility in Ireland:

Demonstration phase:

- Implement the Early Hydrogen Innovation Fund
- Provide long-term clarity on funding and policy support mechanisms and levels

⁸ An e-fuel is a synthetic fuel derived from captured carbon and renewable hydrogen that can be used as a drop-in replacement for conventional fossil fuels

Early Commercial phase:

- National support for hydrogen vehicles linked to HRS
- National support to retrofit vessels with ammonia / methanol -ready engines
- Opex support for RFNBO hydrogen and renewable fuel production

Industrialisation phase:

- Implementation of a SAF and maritime RFNBO fuel mandate with sufficiently high buy-out prices
- Continued policy support subsidising the production of hydrogen for road transport such as RTFCs

With the implementation of this support, HMI members are willing and able to invest in scaling up the supply chains and human capital needed to take advantage of abundant renewable energy to deliver Irish energy independence, economic benefits, and emissions reductions in hard-to-abate sectors.