



## Market Support for a Hydrogen Infrastructure

Hydrogen is an energy vector which enables energy to be stored and transferred between heating, transport and power generation, much like electricity is now. Hydrogen has the potential to decarbonise the UK's use of gas for these applications, in addition to acting as a fossil fuel substitute.

At a national scale, hydrogen is no more expensive to store and distribute than natural gas, presenting a much cheaper alternative to the additional storage and generation capacity that the national grid would require if heating and transport were to be decarbonised by electrification alone. Hydrogen should not be viewed as a competitor to renewable power generation, rather an enabler of its expansion, with small-scale, local infrastructure projects proving the technical feasibility of substituting fossil fuels for hydrogen.

Kiwa has advised on the development of hydrogen infrastructure projects for many years and one thing is abundantly clear: production, storage, distribution and use of hydrogen will only become competitive against fossil fuelled alternatives once the scale of a hydrogen infrastructure is comparable with that used to mine, ship, store and distribute such competing alternatives. National scale, renewable power generation projects, such as offshore wind farms, are now accepted as market competitive, but this was not always the case. A combination of market support measures linked to decarbonisation impact and incentivising cost reduction over more than a decade provided the market signals to corporate investors, manufacturers and project developers that such projects were increasingly worth investing in.

Based on Kiwa's experience to date, this paper makes the case that providing similar market support measures for the development and operation of hydrogen infrastructure projects should attract the private investment required to scale these up to the point where they become as investible, as with offshore wind farms today.

### [Flow chart of recommended government support and the predicted return on that investment](#)

The UK Government and department of Business, Energy and Industrial Strategy (BEIS), in particular, has a legal obligation to decarbonise the heating and transport sectors. The question that remains is: "How?". The development of national scale infrastructure will require the development and growth of a new industry. Fortunately, the skills, the available capital and the appetite for investment risk to develop hydrogen infrastructure already exists in the oil and gas sector. However, without market support to develop and operate new projects, aligned with the strategic support to nurture this new industry, the companies involved lack the necessary incentives to make the move to hydrogen a reality. They have the 'means' and the 'opportunity', but currently they lack the 'motive'.



If UK Government elect to support the development and scale up of hydrogen infrastructure, fundamental strategic industry support will be necessary to develop:

- **New technologies and new infrastructure**  
(or adaptation of existing infrastructure enabling safe production, storage, distribution and use of hydrogen).
- **New markets**  
(also changes to existing regulation, enabling the trading of hydrogen as an energy vector).
- **New skills and working practices**  
(designing, building and operating the new infrastructure and developing standards to govern these).

The Government funding of hydrogen projects such as Hy4Heat, the hydrogen supply programme, HyDeploy, H100 and H21 demonstrates that BEIS is already working jointly with GDNOs, standards bodies and market regulators to support hydrogen feasibility and demonstration projects. Progress being reported by these projects, is making apparent that hydrogen will be a feasible substitute for natural gas. Building on momentum from these projects, the same parties would need to **a)** agree market support measures needed to establish a hydrogen industry that is capable of deploying hydrogen infrastructure at national scale and **b)** consult with colleagues working in related technology areas to ensure that any support provided continues to offer best value for money vs. the alternatives.

Only by taking a strategic perspective and being flexible enough to react to market changes can one answer questions such as: *“At what point does the benefit of producing hydrogen outweigh other uses of renewable power and how should the market support for each of these forms of generation/production be tailored to find the right balance?”*.