Hydrogen Coordination Forum

10 Quick Wins for Hydrogen

Hydrogen Energy Association

HYDROGEN SOUTH WEST

RenewableUK

REA THE ASSOCIATION FOR RENEWABLE ENERGY & CLEAN TECHNOLOGY

Carbon Capture & Storage Association

North West Hydrogen Alliance

scottish renewables

MHFCN Midlands Hydrogen & Fuel Cell Network

Decarbonised Gas Alliance

Hydrogen East

This document has been developed by the Hydrogen Co-ordination Forum, which brings together a range of national and regional bodies across the UK's hydrogen landscape. The Forum is convened by the Hydrogen Energy Association, with other members including Renewable UK, the REA, Hydrogen East, the North-West Hydrogen Alliance, Scottish Renewables, Hydrogen Southwest, the Carbon Capture and Storage Association, the Decarbonised Gas Alliance, and the Midlands Hydrogen and Fuel Cell Network.

Hydrogen is an important component of the energy transition, as well as offering substantial energy security and clean growth benefit. As such, it sits alongside other vectors, such as electricity. Both will require careful planning to deliver optimal outcomes, including how and where new electricity and hydrogen infrastructure is developed and how the system as a whole will be connected.

There has been some good initial progress to develop hydrogen in the UK, and these 'Quick Wins' reflect the early stage of the industry and represent opportunities to 'smooth the path' going forward. We agree that there are a series of 'Quick Win' policy reforms that, collectively, would support significant, and quicker, growth of the UK hydrogen economy and release private investment faster into the market – results that are essential to deliver on the UK Government's Climate Targets.

In this document, the Hydrogen Co-ordination Forum outlines some of the most significant practical barriers to the rollout of the hydrogen that are in need of immediate policy reform. Failure to address these 'quick wins' to date is indicative of the rapid pace of development in hydrogen. As practitioners deploy projects, they are experiencing practical, unanticipated challenges which will become increasingly significant blockers as scale-up and roll-out accelerates. Whilst previous energy transformations have happened over decades, allowing challenges to be addressed over time, the speed of growth that we expect and need with hydrogen means that a more proactive approach will be needed. Highlighting and addressing these 'Quick Wins' now will avoid costly delays later.

‘Quick Wins’ summarised

1. Stimulate demand to accelerate overall roll-out
2. Simplify planning framework to reduce costs and delays
3. Reconfirm commitment to hydrogen for net zero to bolster investor confidence
4. Clarify role for blending to enable project developers to better plan
5. Allow Risk Taking Intermediaries in Government funding for hydrogen production to mitigate producer volume risk
6. Reduce temporal correlation requirements for project developers on a temporary basis to improve cost competitiveness
7. Include Hydrogen internal combustion (ICE) in definitions of zero emission transport to deliver economic and employment benefits across the UK
8. Develop hydrogen refuelling standards to support roll-out of hydrogen mobility in the UK
9. Include hydrogen within the Venture Capital Scheme to enhance access to venture capital
10. Enhance role for regions in hydrogen roll-out to embed benefits nationally

Stimulate demand to accelerate overall roll-out

1

Challenge

Uncertainty around the level of demand for hydrogen, which is stalling the rollout of supply.

Stakeholders

- DESNZ
- DfT
- Regional Councils
- DBT

Why this Matters

Whilst the Government's commitment to hydrogen production is clear, evidence as to how this demand is going to be stimulated is patchy at best. Producers need certainty that there is going to be demand for low carbon hydrogen in the near future.

A recurring concern across industry is that the focus on production capabilities for hydrogen are not being matched across end users and offtakers, with the result that demand is not stable enough to stimulate the widespread rollout of hydrogen at pace.

Solutions

We ask that the regional and central Governments commit to procuring a certain percentage of hydrogen to align with the growth in hydrogen production so as to guarantee an initial demand for hydrogen and stimulate further supply. We suggest that this could be implemented in the form of Government tendering.

We also strongly urge the Government to either establish a cross-departmental hydrogen working group or enhance the authority of the existing Hydrogen Delivery Council to tackle the issue of hydrogen demand more comprehensively. There must be more collaboration and communication between DESNZ, DfT, and Innovate UK.

Simplify planning framework to reduce costs and delays

2

Challenge

The fragmented planning and permitting framework for hydrogen projects is slowing the pace at which the hydrogen economy is developing. This is exacerbated by lack of knowledge of hydrogen among planners and other stakeholders.

Stakeholders

- DESNZ
- EA

Why this Matters

Due to the large variation in size and scale of hydrogen projects, a range of consenting processes may apply. The Town and Country Planning Act (TCPA) 1990, Planning Act 2008 and consenting regimes applicable to gas processing, electrical infrastructure and environmental protection provide a fragmented framework to progress an application. Furthermore, the National Planning Policy Framework (NPPF) and supplementary policy notes currently have no reference to hydrogen.

The stringency of environmental permitting for hydrogen projects needs to reflect their significantly lower carbon impact relative to fossil fuel alternatives if we are to incentivise decarbonsiation.

A further planning barrier is that local authorities and planners are not sufficiently familiar with hydrogen technology and processes.

Solutions

Alongside the upcoming release of the 'Guidance on emerging techniques for hydrogen production by electrolysis of water' by the Environmental Regulators, we recommend that the Environment Agency (EA) consider a more context specific, proportional advice to avoid hampering planning applications for smaller projects with a relatively minimal environmental impact.

We also recommend an update to NPPF – particularly Section 14 (Meeting the challenges of climate change, flooding and coastal change) and to expand definition of low carbon energy to include hydrogen production, storage, transportation and use.

We ask that the Government adopts a strategy of distributing targeted and accessible information to local councils and planning authorities to ensure they have all the necessary information about hydrogen technologies and practices to make swift and informed planning decisions.

See Annex 1 for further details

Reconfirm commitment to hydrogen for net zero to bolster investor confidence

3

Challenge

Potential for adverse impacts on private sector confidence resulting from perceptions that some parts of net-zero policy landscape are being rolled back.

Stakeholders

- DESNZ

Why this Matters

With the upcoming elections, as well as some ambiguity around recent statements, there is concern that investors might be hesitant to support hydrogen development, as well as other low carbon sectors.

At a time when we need to build a hydrogen economy from the ground up, at pace, we cannot afford any unfounded market hesitation.

Solutions

We ask that any incoming Government offer a reaffirming statement soon after the elections. The purpose of this would be to clarify the crucial role of hydrogen in achieving the UK's 2050 net zero target. Assuring that the hydrogen policies, roadmaps, and funding mechanisms will stand for the coming years will give the hydrogen industry confidence, not least to investors who are crucial for the sector's growth.

In this respect, we also ask that the profile of the Energy Minister be raised to demonstrate the Government's commitment to Net Zero.

Clarify role for blending into the gas distribution network to enable project developers to better plan

4

Challenge

Uncertainty surrounding the incorporation of hydrogen blending into future funding streams (e.g. Hydrogen Allocation Rounds).

Stakeholders

- DESNZ

Why this Matters

The lack of clarification surrounding a decision on which future funding streams or which Hydrogen Allocation Round will incorporate blending is causing uncertainty for developers and producers. This slows project development and prevents FID from being reached.

Blending would help to mitigate cross-chain volume risks relating to development of hydrogen transport and storage infrastructure if, for example, an infrastructure project is delayed. If a decision on blending is to be prolonged or ultimately discouraged, then industry must be allowed enough time to mitigate risk in other ways.

Solutions

We ask for further clarity on when and how blending will be supported; producers cannot afford to wait long periods for a decision that may not be favourable.

More detail is needed on what an 'offtaker of last resort' (Strategic Policy Decision on Blending, 2023) actually constitutes and how this would unfold in a practical sense.

Allow Risk Taking Intermediaries in Government funding for hydrogen production to mitigate producer volume risk

5

Challenge

Risking taking intermediaries not being accepted as eligible offtakers in Hydrogen Allocation Round 2 (HAR2).

Stakeholders

- DESNZ

Why this Matters

Producers need as much offtake as possible to make their projects viable. If primary offtakers cannot take all the volume produced, then the project will under-produce and will either fail to deliver its expected returns (which will prevent further investment), or will have to increase its prices to offtakers.

The eligibility of risk taking intermediaries as offtakers under future HARs would allow producers to mitigate volume risk, which is crucial given that the Low Carbon Hydrogen Standard requires producers to use almost exclusively renewable electricity, of which production volumes are to some extent unpredictable.

A single risk taking intermediary could link a number of smaller offtakers and producers, and thus improve the security of supply for the whole chain.

Solutions

We strongly recommend including risk taking intermediaries as eligible offtakers in HAR2 and thereafter to allow more flexibility for the initial waves of hydrogen projects and avoid stranded assets.

Whilst we note the Government's concern that allowing risk taking intermediaries to resell subsidised hydrogen may not represent the best value for money, we believe that this could be managed with price controls or limiting the volume sold to intermediaries - and is necessary for stimulating the hydrogen economy.

We recommend that Government looks at options to flex its approach to allow contracting models which clearly flow from production shareholders in the consolidating intermediary. This ought to be allowed and controls ought to be capable of being put in place.

Reduce temporal correlation requirements for project developers on a temporary basis to improve cost competitiveness

6

Challenge

Lack of flexibility in the temporal correlation regulation imposed on hydrogen producers adding increased costs and risk for projects.

Stakeholders

- DESNZ

Why this Matters

Currently, every 30 minutes producers are required to demonstrate the carbon footprint of the hydrogen they produce by splitting input electricity into "consignments". This is needed to comply with the maximum of 20g CO2 equivalent per MJ of hydrogen permitted within the Low Carbon Hydrogen Standard (LCHS).

As the carbon footprint of grid electricity is typically equal to 100g of CO2, but can vary widely, producers are limited to a small amount of grid electricity. This means that producers have to oversize electrolysers and / or add extra storage to ensure a steady output to the offtaker both of which add cost into the project.

Solutions

We recommend that the LCHS compliance criteria be adjusted to include monitoring electricity input consignments on a monthly basis. A weekly or even a daily basis would still allow far more flexibility for the first wave of hydrogen production facilities. We recommend aligning more with the European Commission's decision to only commence hourly matching from 2030; this will help to prevent UK hydrogen projects being at a disadvantage.

We also ask that the energy input from curtailed wind electricity be considered to have a carbon footprint of zero in Version 4 of the LCHS. In addition, a definition of a "hybrid Balancing Mechanism Unit" needs to be developed so co-located assets, where generation is under a Contract for Difference or Renewable Obligation, can be optimised behind the meter when curtailed.

The energy consumption of electrolysers should follow a similar system to that incorporated in the electric car model, whereby price tariffs are included to encourage off-peak usage of grid electricity but no hardline regulation is in place owing to the fact that the grid will be considerably greener when large scale deployment arrives.

Include Hydrogen internal combustion (ICE) in definitions of zero emission transport to deliver economic and employment benefits across the UK

7

Challenge

Hydrogen Internal Combustion Engines (Hydrogen ICE) not being accepted by the UK as a Net Zero technology solution in the transport sector or the Non-Road Mobile Machinery (NRMM) sector.

Stakeholders

- DfT
- DESNZ

Why this Matters

If the UK does not include hydrogen ICEs in its definitions of zero emission transport, the economic and employment benefits of automotive manufacturers, as well as their export opportunities, will be lost to other nations which support the technology. The UK should pursue this technology, building on home grown innovation to avoid having to rely on imports.

Solutions

We strongly recommend that the UK include Hydrogen ICE as a Zero Emissions technology in its widest sense. There should also allow be provisions to support short term decarbonisation via retrofitting with Hydrogen ICEs.

On the innovation front, there is an urgent need to alter funding support mechanisms, such as the Automotive Transformation Fund and Innovate UK schemes to include technology and supply chain development for Hydrogen ICE production and development.

Develop hydrogen refuelling standards to support roll-out of hydrogen mobility in the UK

8

Challenge

Lack of detail and policy surrounding the hydrogen refuelling standards and infrastructure for larger vehicles.

Stakeholders

- BSI
- DfT

Why this Matters

The UK Hydrogen Heavy Goods Vehicle (HGV) industry, similar to the rest of the global market, has struggled with the lack of appropriate standards for:

- Fast refuelling to facilitate ease of use and ensure the efficiency and profitability of business operations.
- Refuelling at ambient temperatures so that hydrogen mobility is affordable.
- Realistic safety zone regulations so that the transition to Zero-Emission mobility is safe yet practical.

The International Organization for Standardization (ISO) has withdrawn ISO 19885-3 relating to 'High flow hydrogen fuelling protocols for heavy duty road vehicles' and the British Standards Institute (BSI) has also withdrawn its high flow hydrogen fuelling protocol standard update. Thus, there is no updated guidance under BSI or ISO for heavy duty vehicles.

Solutions

We need pace and clarity from the BSI regarding the timeline of when refuelling protocol for heavy duty vehicles will be updated, given there is currently no standard to follow.

We recommend that BSI works with the ISO to develop a complete series of hydrogen specific refuelling standards. This will help the industry and market to function more efficiently and effectively.

We welcome the developments of Technical Informational Report (TIR) SAE J2601-5, which caters for the refuelling needs of heavy-duty vehicles, and we recommend that the BSI and ISO work at pace to deliver an aligning standard.

We also call on Government undertake a gap analysis to identify areas where standards are missing and develop a strategy to fill the gaps.

Include hydrogen within the Venture Capital Scheme to enhance access to venture capital

9

Challenge

Limits on access to venture capital funding due to Hydrogen projects not being eligible under the Enterprise Investment Scheme (EIS), despite being substantially riskier than other renewable investments.

Stakeholders

- HM Revenue and Customs
- DESNZ

Why this Matters

The EIS offers tax relief to individual investors who buy new shares in companies. Excluding hydrogen projects from this subsidy scheme is hampering the ability of developers to attract investment with which to fund new hydrogen projects and kickstart the UK hydrogen economy.

Companies do not qualify for the EIS if more than 20% of their trade includes generation of energy such as electricity and heat, production of gas or other fuel, and exporting electricity (HM Revenue & Customs).

Solutions

We ask that the Venture Capital Schemes Manual be amended to include hydrogen companies with activities relating to the generation of energy, such as electricity and heat, production of gas or other fuels, and exporting electricity.

This could be a temporary amendment so as to incentivise investors to direct more venture capital into hydrogen projects. This will allow more hydrogen projects to secure the financial backing they need to reach Financial Investment Decisions (FID) and would help kickstart the hydrogen economy.

The point at which hydrogen is well established in the UK economy and investments become less risky could signal the end of its inclusion in the EIS.

Enhance role for regions in hydrogen roll-out to embed benefits nationally

10

Challenge

Non-optimised use of funding to support the growth of hydrogen across the UK.

Why this Matters

Support for hydrogen across the UK must be anchored in the support of local supply chains so as to support regional hubs that require more concentrated decarbonization efforts via the early establishment of hydrogen ecosystems.

Solutions

We ask that regional groups receive funding in order to anchor and expand their work within the regions and support the growth of the UK hydrogen industry from the 'bottom up'.

We also ask that the Government hold departmental meetings in active regions and hubs to demonstrate real commitment to levelling up.

Stakeholders

- DESNZ

Annex 1
Further details on the complexity of the planning process

- *TCPA 1990* considers power projects under 50MW (AC) to be decided at a local level with surface industrial installations over 0.5ha to be worthy of an Environmental Impact Assessment;
- Planning Act 2008 requires consent for larger projects who meet certain criteria via the *National Significant Infrastructure Projects (NSIP)* process;

NSIPs: general

- In this Act "nationally significant infrastructure project" means a project which consists of any of the following;
  - the contruction or extension of a generating station;
  - the installation of an electric line above ground;
  - development relating to underground gas storage facilities;
  - the contruction or alteration of an LNG facility;
  - the construcion or alteration of a gas reception facility;
  - the construction of a pipe-line by a gas transporter;
  - the construction of a pipe-line other than by a gas transporter;

Key highlights of the NSIP threshold (Section 14-20):

- Onshore schemes in England: 50MW (AC) for solar, 100MW (AC) for wind;
- Offshore schemes in England: 100MW (AC) for wind;
- Onshore and Offshore schemes in Wales: 350MW (AC) for solar and wind;
- Gas storage in porous strata over 43 million cubic meters storage or 4.5 million cubic meters per day flow rate;
- Same applies for LNG above-ground storage;
- Gas reception facilities for imports;
- Gas pipelines over 7bar, over 800mm diameter or 40km in length (or significantly impacting the environment), serving over 50,000 customers directly or indirectly;
- Section 36 of the Electricity Act 1989 requires consent for >50MW projects by Secretary of State where the NSIP threshold is not met and can be enforced by the TCPA under Section 90.
- For storage, a licence is required under the *Planning (Hazardous Substances) Regulations 2015* for up to 2 tonnes of hydrogen, but triggers the ***Control of Major Accident Hazards Regulations 2015*** over 5 tonnes which requires emergency plans and a prevention policy.
- NPPF National Policy Statements (EN-2 & EN-4) unveiled by BEIS in 2021 provide initial thresholds for the NSIP process for hydrogen schemes.

Annex 1
Further details on the complexity of the planning process (continued)

NSIPs: observations

- Different policies apply for England, Wales and Scotland;
- Narionally Significant Infrastructure Projects: observations
- Subjectivity interpreting the thresholds;
- There is Blue hydrogen is classed as essential infrastructure, why not green H2?
- Section 36 of Electricity Act is also applicable for electrical infrastructure
- Section 1 under the Pipelines Act 1962 – over 10 miles needs sign off.
- CCUS enabled hydrogen is classed as essential infrastructure, but electrolytic hydrogen is not.

Annex 2
Further details on the current refuelling standards relevant to hydrogen HGVs

- **SAE J2601** is a series of fuelling protocol standards to address the needs of light duty and heavy duty vehicles, and forklifts published by SAE International.
- December 2023, SAE released **TIR SAE J2601-5** for 'High-Flow Prescriptive Fuelling Protocols for Gaseous Hydrogen Powered Medium and Heavy-Duty Vehicles'. Currently, TIR SAE J2601-5 is a Technical Information Report (TIR), the pre-requisite to a standard.
- **BS ISO 19880** is a mandatory British Standards Institute (BSI) standard adopted from the International Organisation for Standardisation (ISO). It defines the minimum requirements considered applicable worldwide for the hydrogen and electrical safety of hydrogen refuelling stations, providing guidance on design, installation, operation, maintenance and testing of HRS. Yet these standards are mostly used for light duty hydrogen-powered vehicle refuelling.
- **ISO 19885** is a subset of standards that defined gaseous hydrogen fuelling protocols for hydrogen-fuelled vehicles. It was titled 'Gaseous hydrogen — Fuelling protocols for hydrogen-fuelled vehicles. **ISO 19885-1** and **ISO 19885-2** are the most up to date standards that define the general protocols for hydrogen-fuelled vehicles.
- **ISO 19885-1** specifies the design and development process for fuelling protocols, while **ISO 19885-2** defines the communication interface between the vehicle and the hydrogen refuelling station.
- **ISO 19885-3** relates to 'High flow hydrogen fuelling protocols for heavy duty road vehicles'. Unfortunately, ISO's website states that the development of **ISO 19885-3** has been deleted and therefore **there is no updated guidance under ISO for heavy duty vehicles**.
- BSI's standards to align and confirm with **ISO 19885-1, ISO 19885-2** and **ISO 19885-3** are in development. However, the BSI's website still states that **BS ISO 19885-3** is active even though it has since been removed by the ISO.

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