Department for
Business, Energy
& Industrial Strategy

Designing the Net Zero Hydrogen Fund – Consultation

Closing date: 25 October 2021

August 2021

Any enquiries regarding this publication should be sent to us at:
HydrogenProduction@beis.gov.uk

Contents

General information

Why we are consulting

The government is seeking views on how we design the Net Zero Hydrogen Fund (NZHF) to maximise its benefits, while ensuring value for money.

Previous stakeholder engagement, such as informal engagement with project developers and trade groups, formal engagements via the Department for Business, Energy and Industrial Strategy (BEIS) forums and working groups, and a survey of electrolytic projects, has improved our understanding of the UK's potential hydrogen production capacity and the barriers to deployment. This consultation will allow us to gather more robust information on the project pipeline and help us to better understand the issues faced by hydrogen production projects. We invite your views and seek evidence to the questions below. Responses will help inform the design of the NZHF ahead of its intended launch in early 2022.

Consultation details

Issued:	17 August 2021
Respond by:	25 October 2021
Consultation reference:	Designing the New Zero Hydrogen Fund - Consultation.
Audiences:	• Companies involved in the construction of low carbon hydrogen production projects. • Companies that are looking for development support for low carbon hydrogen production projects. • Interested members of the public.
Territorial extent:	The scope of this consultation is UK-wide. Our preferred approach is for the NZHF to be funded and delivered on a UK-wide basis to support decarbonisation across the UK. We will continue to work closely with the Devolved Administrations as we develop and finalise the design of the NZHF.

How to respond

Respond online at:	beisgovuk.citizenspace.com/clean-growth/net-zero-hydrogen-fund
or	
Email to:	HydrogenProduction@beis.gov.uk

When responding, please state whether you are responding as an individual or representing the views of an organisation.

Your response will be most useful if it is framed in direct response to the questions posed, though further comments and evidence are also welcome.

Confidentiality and data protection

Information you provide in response to this consultation, including personal information, may be disclosed in accordance with UK legislation (the Freedom of Information Act 2000, the Data Protection Act 2018 and the Environmental Information Regulations 2004).

If you want the information that you provide to be treated as confidential please tell us, but be aware that we cannot guarantee confidentiality in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not be regarded by us as a confidentiality request.

We will process your personal data in accordance with all applicable data protection laws. See our privacy policy.

We will summarise all responses and publish this summary on GOV.UK. The summary will include a list of names or organisations that responded, but not people's personal names, addresses or other contact details.

Quality assurance

This consultation has been carried out in accordance with the government's consultation principles.

If you have any complaints about the way this consultation has been conducted, please email: beis.bru@beis.gov.uk.

Executive summary

The Net Zero Hydrogen Fund (NZHF), announced in the Prime Minister's *Ten Point Plan for a Green Industrial Revolution*, is worth up to £240 million and will be delivered between 2022 and 2025. The aim of the NZHF is to support the commercial deployment of new low carbon hydrogen production projects during the 2020s, ensuring the UK has a diverse and secure decarbonised energy system fit for meeting our ambition of 5GW low carbon hydrogen production by 2030, and commitment to reach net zero by 2050.

This consultation forms part of a suite of documents in the wider Hydrogen Strategy package. There are interdependencies with other documents in the package, in particular the consultation on proposals for a Low Carbon Hydrogen Business Model. We have also published an overarching Hydrogen Analytical Annex which provides a detailed discussion of the analytical considerations for the NZHF and other policy interventions.

Our proposals for the NZHF

We intend to launch the NZHF in early 2022. Table 1 below sets out our proposed policy design framework for the NZHF.

Table 1: Proposed NZHF policy design framework

Scheme design element	Our proposal
Type of funding	• Grant funding (to be co-funded with private sector funding).
Technologies	• Support multiple hydrogen production technologies, including the main types of production (carbon capture usage and storage (CCUS)-enabled hydrogen, and electrolytic hydrogen). • Target projects that can realistically begin production of low carbon hydrogen during the 2020s.

Activities	• Capital co-funding for the build of new low carbon hydrogen production facilities, which includes:
	  • Projects that will also require revenue support via a hydrogen business model; and
	  • Projects that will not require revenue support via a hydrogen business model.
	• Development costs for feasibility and Front End Engineering Design studies (FEED), with possible support for post-FEED studies.

Scheme design element	Our proposal
Eligibility and project assessment criteria	• Core eligibility criteria to ensure projects that apply are credible, new low carbon hydrogen production projects in the UK. • Assessment criteria to select which projects the NZHF should support and ensure the funding is aligned with the NZHF objectives and wider government strategic objectives.
Delivery	• A flexible approach to support the range of projects across the NZHF lifespan. We are considering how to phase the NZHF to deliver this objective.

1. Context

The UK has set a world–leading net zero target by 2050, the first major economy to do so, and hydrogen will play a vital role in delivering on this commitment. In line with the recommendation from the independent Climate Change Committee (CCC), the UK has recently committed in law to reduce emissions by 78% by 2035 compared to 1990 levels.[1] This sixth Carbon Budget (CB6) limits the volume of greenhouse gases emitted over a 5-year period from 2033 to 2037, taking the UK more than three-quarters of the way to reaching net zero by 2050.

The Prime Minister's *Ten Point Plan for a Green Industrial Revolution*[2] and the government's Energy White Paper,[3] set out commitments that will help the UK's trajectory towards meeting CB6. This includes the plan for driving the growth of low carbon hydrogen. Working alongside industry partners, our aim is for the UK to develop 5GW of low carbon hydrogen generation by 2030, and we hope to see 1GW of this production capacity by 2025. The Ten Point Plan set out a range of new measures, including the NZHF worth up to £240 million, to support this aim.

The UK Hydrogen Strategy sets out our vision for growing our hydrogen economy.

1.1 UK Hydrogen Strategy

The UK's first ever Hydrogen Strategy, which has been published alongside this consultation, sets out our vision for hydrogen's role in decarbonising the UK economy and powering a green recovery, as well as detailing how we will drive progress in the 2020s to meet our 5GW production ambition by 2030, and to help to achieve CB6 and net zero. Please find the link to the Hydrogen Strategy here.

Why Hydrogen?

Low carbon hydrogen can support the deep decarbonisation of the UK economy, particularly in ''hard to electrify'' UK industrial sectors: in industry and heavy transport, especially in shipping, as well as certain bus and rail routes, and potentially Heavy Goods Vehicles (HGVs).[4] It could also play a major role in other end use sectors. In power, hydrogen's flexibility of end use and its ability to be stored at scale for long durations (relative to electricity) can provide multiple benefits, such as for inter-seasonal storage and for use in gas power plants that help to meet peak electricity demand (i.e., dispatchable peaking gas turbines).

Hydrogen could also play a role in the decarbonisation of heating. For example, subject to safety and cost assessments, the Ten Point Plan set out plans to work with industry to deliver

1 Sixth Carbon Budget: https://www.theccc.org.uk/publication/sixth-carbon-budget/
2 The Ten Point Plan for a Green Industrial Revolution: [2] The Ten Point Plan for a Green Industrial Revolution: https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution
3 Energy White Paper: https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future
4 For more information, see Decarbonising transport: a better, greener Britain, which can be found at: https://www.gov.uk/government/publications/transport-decarbonisation-plan

a hydrogen neighbourhood trial by 2023, a large hydrogen village trial by 2025 and a potential hydrogen town pilot before the end of the decade.

Current UK hydrogen production and use is heavily concentrated in chemicals and refineries.[5] Here the hydrogen, largely produced from natural gas (without carbon capture), is used as a feedstock, or input, into making other chemicals and plays a variety of roles in refineries to convert crude oil into different end products. At present an estimated 10-27TWh[6] of hydrogen is produced in the UK, mostly for use in the petrochemical sector. There is only a very small amount of electrolytic hydrogen production in the UK at the moment, mostly for use in localised transport projects.

Twin Track Approach to Hydrogen Production

As set out in the Hydrogen Strategy, as we shift to low carbon production and scale up our ambition through the 2020s, we expect the main production methods to be steam methane reformation with carbon capture utilisation and storage (CCUS), and electrolytic hydrogen predominantly powered by renewables (twin-track approach). But these are not the only methods that could play a role in our future energy mix. The UK therefore intends to support multiple hydrogen production routes to enable us to develop low carbon hydrogen rapidly and at scale, with a particular focus on technologies that can deploy during the 2020s in order to meet our 5GW ambition by 2030.

The UK has expertise and assets to excel in both main production routes. The first movers in the early 2020s are likely to be mostly small (less than 5MW) electrolytic hydrogen projects that can be deployed at pace, with production and end use closely linked at, for example, a transport depot or industrial site. By the mid-2020s we could start seeing larger (100MW) electrolytic hydrogen projects and the first CCUS-enabled hydrogen production facilities based in industrial clusters. At this stage, producers could be catering for a growing range of customers across transport, industry and power generation as well as potential to supply hydrogen heat trials and blend low carbon hydrogen into the gas grid. By the end of the decade, we could have multiple large (350MW+) production facilities across the UK, with extensive cluster networks and integration into the wider energy system. Achieving our 2030 ambition will provide around 40TWh of low carbon hydrogen for use across the economy.

The exact production mix by 2030 will be influenced by a range of factors, such as carbon pricing and the policies being consulted on in parallel to the Hydrogen Strategy. Alongside this, investor confidence and market forces will dictate the type of projects that will come forwards during the 2020s. In the longer term, electrolytic hydrogen offers greater carbon reduction potential and cost reductions making it cost-competitive with CCUS-enabled hydrogen over time. Using the 2020s to learn by doing, supported by research and innovation, will provide the lead-in time needed to enable commercial production of electrolytic hydrogen from the 2030s

[5] Fuel Cells and Hydrogen Observatory, Hydrogen Demand (viewed on 9 June 2021)
[6] Energy Research Partnership (2016), Potential Role of Hydrogen in the UK Energy System, available at: https://erpuk.org/project/hydrogen/
DNV GL (2019), Hy4Heat Hydrogen Purity - Final Report, available at: https://www.hy4heat.info/s/WP2-Report-final.pdf

onwards, ensuring it can plug into the wider hydrogen value chain commercialised through large scale CCUS-enabled hydrogen production in the 2020s.

Please see the Hydrogen Analytical Annex for further information on market developments.

Building Back Better

As set out in the Hydrogen Strategy, the UK is well positioned to be a world leader in low carbon hydrogen production and use, delivering green jobs and growth to support levelling up across our industrial heartlands and the Union. But we can only realise these economic opportunities if we act now to put in place the necessary environment and support to develop robust supply chains, upskill our people, secure high-quality jobs, and lay the groundwork to unlock investment and export opportunities.

Learning-by-doing in the 2020s will be hugely beneficial for building sustainable supply chains, maintaining world-class skills and capabilities, supporting job creation and for UK companies to be in a position to put themselves at the forefront of a growing global hydrogen market.

Our 5GW ambition would also mean the creation of a thriving new hydrogen industry, which could support over 9,000 jobs and £900m of Gross Value Added (GVA) by 2030. Government investment in hydrogen to de-risk early projects could unlock £4bn of private sector co-investment by 2030. Our 5GW ambition also sets us on a promising pathway post-2030. Our analysis shows that, under a high hydrogen scenario, up to 100,000 jobs and £13bn of GVA could be generated from the UK hydrogen economy by 2050[7].

1.2 Policies to support Hydrogen Production

The measures in Table 2 demonstrate the government's commitment to driving forward the growth of low carbon hydrogen. The policies listed are a mix of hydrogen specific and technology neutral interventions which focus on wider decarbonisation goals, of which hydrogen uptake is a subset.

Table 2: Policies to support growth of hydrogen economy

Policy	Summary
Hydrogen Supply Competition 1 (HySupply 1)	Hydrogen Supply Competition 1 (HS1), which was part of the £505 million Energy Innovation Programme (EIP), offered £33 million of funding for First-of-a kind (FOAK) hydrogen projects spread over two phases: • Phase 1 - £5 million for Feasibility studies awarded in 18/19. • Phase 2 - £28 million for selected projects from phase 1 for implementation and demonstration between 19/20-20/21.

[7] Source: Internal BEIS analysis based on the EINA methodology with updated domestic and global scenarios; figures consider the direct GVA and jobs linked to hydrogen production, stationary CHP fuel cells and domestic distribution only. Vivid Economics (2019), 'Hydrogen and fuel cells (EINA sub-theme)': https://www.gov.uk/government/publications/energy-innovation-needs-assessments

Policy	Summary
Hydrogen Supply Competition 2 (HySupply 2)	The c. £60 million Low Carbon Hydrogen Supply 2 (HYS2) competition is the follow on from the highly successful HS1 competition and aims to accelerate the development of a wide range of innovative low carbon hydrogen supply solutions to enable development of a hydrogen economy compatible with net zero targets. It is proposed that the competition will be delivered via two streams. Stream 1 is intended to be for market entry projects. Stream 2 is intended to be for more mature projects that can proceed quickly and play into the government's ambitious agenda to scale-up hydrogen use, as well as potentially providing a pipeline of projects for the NZHF.
Industrial Fuel Switching Competitions	Funded from the BEIS Energy Innovation Programme (EIP), the £20 million Industrial Fuel Switching Competition has allocated innovation funding to stimulate early investment in fuel switching processes and technologies. The latest round of funding was awarded in winter 2019, with four projects moving from feasibility studies to demonstration. As listed in the Prime Minister's Ten Point Plan, the £1 billion Net Zero Innovation Portfolio, delivered between 2021 and 2025, will include innovation funding for industrial fuel switching.
Green Distilleries Fund	Funded from the BEIS Net Zero Innovation Portfolio (NZIP), the Green Distilleries Competition is providing £10 million to help distilleries go green. It aims to fund a portfolio of different solutions which could include electrification, hydrogen, biomass & waste, power generation, fuel transportation and storage. Nine of the 17 feasibility studies funded at Phase 1 are for low carbon hydrogen-related projects.
Industrial Decarbonisation Challenge Fund	The Industrial Decarbonisation Challenge (IDC) awarded £171 million for projects preparing for and conducting FEED studies. Over £41 million went to projects with a major focus on hydrogen production, with the rest supporting CCUS infrastructure in industrial clusters across the UK. This infrastructure can enable the development of further CCUS-enabled hydrogen projects. The challenge will increase the competitiveness of industry and contribute to the UK's drive for clean growth.

Policy	Summary
Industrial Energy Transformation Fund	Announced at Budget in 2018, the £315 million Industrial Energy Transformation Fund (IETF) is supporting the uptake of technologies that improve energy efficiency and reduce the carbon emissions associated with industrial processes. The fund aims to de-risk key technologies such as hydrogen fuel switching by providing support for feasibility and engineering studies and capital support for decarbonisation technologies such as hydrogen fuel switching and electrification. Phase 2 of the scheme is intended to offer at least £220 million of support to enable hydrogen fuel-switching amongst a range of other decarbonisation technologies and is set to launch later in 2021.
Hydrogen Business Model	We have published a consultation on a Hydrogen Business Model to help bring through private sector investment to meet our ambition of 5GW of low carbon hydrogen production capacity by 2030. The Hydrogen Business Model will aim to overcome the cost gap between low carbon hydrogen and higher carbon counterfactual fuels and aims to support multiple hydrogen production routes to enable us to develop low carbon hydrogen rapidly at scale. We intend the business model to be applicable across different production technologies, including the main types of production (CCUS-enabled, and electrolytic hydrogen). The consultation can be found here and will close on 25 October 2021.
Carbon Capture & Storage Infrastructure Fund	We have announced £1 billion of investment to establish two CCUS clusters by the mid-2020s (Track-1) and a further two by 2030 (Track-2). The Carbon Capture & Storage Infrastructure Fund (CIF) will provide capital expenditure for CO2 transport and storage (T&S) networks and for industrial carbon capture projects. In selected clusters, the fund will help deliver the CO2 T&S infrastructure required for CCUS enabled hydrogen production projects. Applications to Phase-1 of the CCUS Sequencing process are now closed, the two successful Track-1 clusters will be announced in October 2021. We are now planning for the launch of Phase-2 to be made in parallel with, or soon after, the Track-1 cluster announcement. We will provide an update on the revised Phase-2 timeline shortly.

Policy	Summary
Renewable Transport Fuel Obligation	Established in 2008, the Renewable Transport Fuel Obligation (RTFO), a certificate trading scheme, aims to increase the use of renewable transport fuels. Renewable hydrogen is labelled as a 'development' fuel under the RTFO, meaning its production is incentivised with higher buy-out value certificates than more established 'renewable' fuels. Currently, hydrogen produced via non-grid connected electrolysis is regarded as a development fuel whilst fossil sourced CCUS-enabled hydrogen is not. The Department for Transport (DfT) has recently consulted on proposals to provide support under the RTFO scheme for more routes to renewable hydrogen. Further details can be found in the RTFO consultation[8] which closed on 23 April 2021.
Hy4Heat	Hy4Heat was allocated £25 million as part of the BEIS Energy Innovation Programme and is running from 2018 to 2021. Its mission is to establish if it is technically possible and safe to replace methane with hydrogen in commercial and residential buildings and gas appliances.[9]

Hydrogen Standards

There is currently no common UK standard defining what is meant by 'low carbon' hydrogen. In light of this, BEIS is working with industry, regulators and academia to understand and compare options for an emissions standard that could define and standardise what is meant by 'low carbon' hydrogen, including:

1. Setting out the methodology for calculating greenhouse gas (GHG) emissions associated with low carbon hydrogen production; and
2. Setting out the maximum acceptable levels of GHG emissions associated with low carbon hydrogen production.

To be eligible to apply for the NZHF, projects would need to demonstrate that they are creating low carbon hydrogen, as defined by the low carbon hydrogen standard. Please see section 4.1 for further details on eligibility criteria.

We are currently consulting on a UK low carbon hydrogen standard. The consultation can be found here and will close on 25 October 2021.

[8] RTFO consultation: https://www.gov.uk/government/consultations/amending-the-renewable-transport-fuels-obligation-rtfo-to-increase-carbon-savings-on-land-air-and-at-sea

[9] For further information, please see the Hy4Heat programme, which can be found here: https://www.gov.uk/government/publications/hydrogen-for-heating-project

1.3. Rationale for the NZHF

The NZHF, worth up to £240 million, forms part of a suite of measures designed to stimulate the deployment of scalable low carbon hydrogen production.

Opportunities

Driving the growth in low carbon hydrogen could deliver support for over 9,000 jobs by 2030, up to 100,000 jobs by 2050 in a high hydrogen net zero scenario, unlock over £4 billion of private investment in the period up to 2030, and provide savings of 41 Mt CO_2 emissions between 2023 and 2032, or 9% of 2018 UK emissions.[10]

Questions

1. **What wider benefits could the NZHF deliver, such as local growth and low carbon leadership opportunities?**

Challenges to scaling up hydrogen production

Whilst CCUS-enabled and electrolysis technologies are proven and there are already successful projects worldwide, the market alone is unlikely to deploy low carbon hydrogen production at the scale or pace needed due to several barriers that impede the commercial development and deployment of low carbon hydrogen in the UK. These are set out in Table 3 below. In addition to barriers specific to production, there are also wider barriers across the low carbon hydrogen supply chain. These are explored in the Hydrogen Analytical Annex.

Table 3 – Production barriers

Barrier	Description
Production costs	The cost of producing low carbon hydrogen is higher than most high-carbon fuel alternatives. This is due (at least in the short term) to the relative immaturity of low carbon hydrogen production technologies. Hydrogen needs to compete against cheaper alternatives for end users such as electricity, natural gas or biomass, but also relies on them for production inputs, which generates efficiency losses. Also, high-carbon alternatives have a cost advantage as their price does not capture the full societal cost of carbon they generate.

[10] Ten Point Plan: https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution

Barrier	Description
Technological and commercial risk	There are considerable technological and commercial uncertainties and risks associated with developing low carbon hydrogen production projects, which are more acute for the earliest projects. Early project developers bear significant learning costs and risks but may not capture the full benefits of the investment.
Demand uncertainty	Producers have no certainty if their supply will be matched by market demand, potentially leading to having to sell at low prices or build-up stocks posing risks to the economic viability of the project. There are significant barriers to hydrogen use which contribute to this demand uncertainty (see Hydrogen Analytical Annex).
Lack of market structure	There are currently only some aspects of the hydrogen market that are regulated. In the short term, this could risk abuse of market power by end users leading to producers having to accept low prices or unfavourable conditions for selling their hydrogen, risking the profitability of the project.
Distribution and storage barriers	To facilitate sales, hydrogen production plants require infrastructure to transport hydrogen to the end users. Coordination failures might lead to undersupply as lack of investment in one section of the market deters investment elsewhere. Specific barriers to distribution and storage are set out in the Hydrogen Analytical Annex.
Policy and regulatory uncertainty	Lack of a clear and consistent long-term policy framework for low carbon hydrogen to enable investors to make an investment decision, adds risks to the investment process. The wider Hydrogen Strategy package published in August 2021 helps to address this production barrier.

Policy gaps for hydrogen production

Several government policies already support industry to invest in low carbon hydrogen production (see Table 2), thereby addressing some of the barriers to production as set out in Table 3. The production barriers are further explained in the Hydrogen Analytical Annex. However, in order to reach net zero climate change goals, we need to bring forward new, at-scale deployment, and government policy needs to facilitate that acceleration. Table 4 below maps existing and developing support for industry to the identified production barriers and identifies which of the remaining gaps the NZHF seeks to address. Chapter 3 sets out how the proposed design of the NZHF will help to fill the relevant production focused gaps. Note, some gaps included in Table 4 are not specific to producers but affect them and require wider policy intervention. These have been included for completeness.

Table 4 – Policy gaps for hydrogen production

Barrier	Existing and developing Policy Support	Policy Gaps for hydrogen production (those addressed by NZHF **are in bold)**
Production costs	• Revenue support to cover ongoing costs via Hydrogen Business Model • Capital expenditure support in CO_2 T&S networks (and resulting fees) via the Carbon Capture & Storage Infrastructure Fund (CIF)	• **Upfront capital cost support to reduce quantum of costs and risks.**
Technological and Commercial Risk	• Development cost support for FOAK projects via innovation funding • Development cost support for projects based in clusters via the Industrial Decarbonisation Challenge (IDC) Fund • Revenue support via Hydrogen Business Model • Capital expenditure support in CO_2 T&S network via the CIF	• **Upfront capital cost support to reduce quantum of costs and risks of "first movers".** • **Development costs to support the gap between innovation and deployment, and for projects not currently eligible via other funds.** • **Development cost support for nth-of-a-kind (NOAK) projects.**
Demand uncertainty	• Industrial end use support via the Industrial Energy Transformation Fund (IETF) • Transport end use support via the Renewable Transport Fuel Obligation (RTFO) • The Green Distilleries Fund • The Clean Steel Fund • Hydrogen Heat trials via Hy4Heat • Volume risk mitigations via Hydrogen Business Model	• *Not directly producer focused.* • *Wider policy interventions are needed.*
Lack of market structure	• Volume risk mitigations via Hydrogen Business Model	• *More regulations may be required.*
Distribution and storage barriers	• Hydrogen Heat via Hy4Heat	• *Not producer focused.* • *Wider policy interventions for distribution and storage support and new regulation may be required.*

Barrier	**Existing and developing Policy Support**	**Policy Gaps for hydrogen production (**those addressed by NZHF **are in bold)**
Policy and Regulatory Uncertainty	• Development cost support for FOAK projects via innovation funding • Development cost support for projects based in clusters via the IDC • Industrial end use support via the IETF • Hydrogen Strategy • Hydrogen Standards • Revenue support via Hydrogen Business Model • Capital expenditure in CO_2 T&S network via the CIF	• **Development cost support to give clarity for projects post innovation funding, off-cluster and nth-of-a-kind projects.** • **Capital cost support to give clarity over funding landscape in the short term.** • *Wider policy interventions for end use, distribution and storage support and additional regulation may be required.*

2. NZHF Objectives and scope

2.1 Role of the NZHF

The NZHF's aim is to support the commercial deployment of new low carbon hydrogen production, ensuring the UK has a diverse and secure decarbonised energy system fit for meeting our net zero commitments.

The main objectives of the scheme are to:

1. **Stimulate new low carbon hydrogen production by supporting projects with upfront costs, leverage private sector investment, and creating high skilled green jobs and clean economic growth across the UK;**
2. **Bring down costs and risks of hydrogen production by demonstrating commercial use of those technologies; and**
3. **Stimulate a future pipeline of projects to contribute towards meeting our 5GW ambition by 2030.**

The role of the NZHF is to support new hydrogen production projects to take Final Investment Decision (FID), to help deliver our ambition of 5GW of low carbon hydrogen production by 2030. Given the vital role hydrogen will play in our low carbon future, we also believe it is also important for the NZHF to support projects looking to conduct feasibility and FEED studies. This should help to ensure the UK has a diverse pipeline of projects coming forward to meet future demand.

Whilst the NZHF is aimed at supporting hydrogen production, government recognises that moving to a hydrogen economy will require a range of appropriate government support right across the value chain. For more information, please see the Hydrogen Strategy.

2.2 Scope

We propose that the NZHF should support multiple production technologies, including the main types of production (CCUS-enabled and electrolytic hydrogen) and be targeted at low carbon hydrogen projects that can deploy during the 2020s in order to meaningfully contribute to meeting our 2030 ambition.

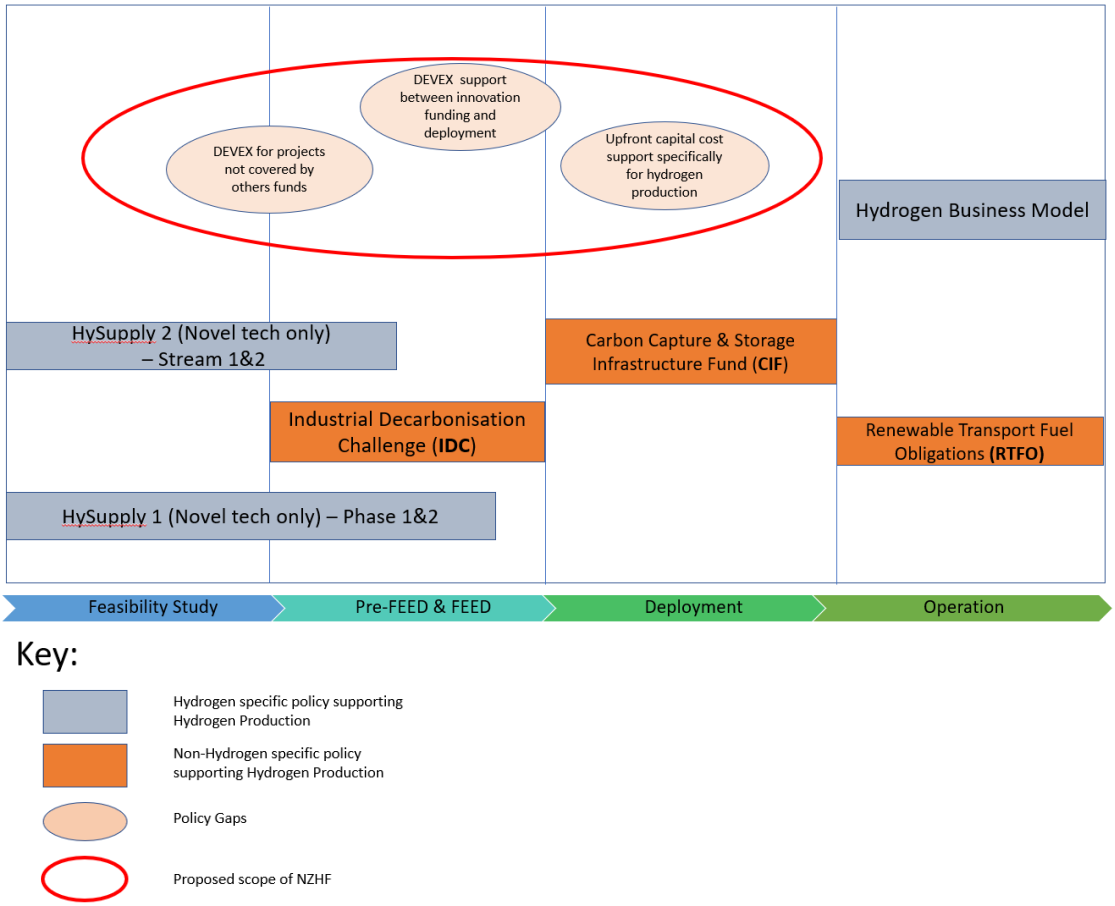
We would welcome views on technologies that may be ready to produce low carbon hydrogen in the early 2020s.

To date, stakeholders have told us they would like us to build on the opportunities generated by government funding for FEED studies, provided via the IDC and HySupply, to help projects move to FID. As such, we propose to offer capital co-funding to help to de-risk private sector investment, with the overall end-goal being to deliver projects across the UK. For pre-FID

projects that also require revenue support via a Hydrogen Business Model, capital co-funding could lower overall project costs and risks, and deliver better value for money for consumers.

Stakeholders have also indicated that there is a need to support feasibility studies in order to develop investable business cases. As such, we propose that support could be given to the feasibility and front-end engineering design stages of projects which could facilitate a pipeline of projects for the future. Figure 1 sets out the proposed scope of the NZHF in relation to other policies.

Figure 1- proposed scope of the NZHF



Given the aim of the NZHF is to bring forward new hydrogen production in the UK to help deliver our 2030 ambition, we propose to focus funding on hydrogen production facilities themselves rather than hydrogen distribution and storage infrastructure, which will be addressed by other policies as set out in the Hydrogen Strategy. This will help to ensure funds are targeted, to maximise the deployment that the NZHF can help bring forward. We would welcome views on what boundary would be appropriate to set around production projects, noting that any funding provided to supporting hydrogen distribution and storage infrastructure would come at the expense of support for production facilities.

Questions

2. **Do you agree with the proposed scope for the NZHF?**

3. **Are there any technologies for low carbon hydrogen production, other than CCUS-enabled and electrolytic hydrogen, that you think could begin production of low carbon hydrogen during the early 2020s? Please give details.**

4. **What boundary should the NZHF set around production projects? Please explain your rationale, including any considerations that may change over time and / or vary according to the types of projects.**

3. Designing the NZHF

3.1 Type of Funding

We have considered a variety of capital financing mechanisms to determine what would be most effective support for low carbon hydrogen production projects. These include:

- **Capital grants:** An award of financial assistance to an eligible applicant, with no expectation that the funds will be paid back. Grants have been successfully used by BEIS for a number of key programmes including the IETF. A grant would have specific terms and conditions that would need to be met, for example this would detail eligible expenditure, timescales for when expenditure can be incurred, milestones and required outputs. Grants are typically offered on a reimbursement basis, so they are paid after the satisfactory completion of specific milestones.
- **Loans:** Capital support to finance projects that must be repaid over a set period of time. Projects are fully owned and delivered by private developers. BEIS has significant experience of managing funding effectively via low-cost government loans.
- **Equity:** Government could take a share in a Special Purpose Vehicle or Joint Venture for a specific project. Projects owned and delivered jointly by private developers and government. This is a more complicated method of managing funding, with balance sheet impacts for HMG and does not align with our broader energy policy approach.
- **Capital guarantees:** Government would underwrite loans provided by financial institutions. Projects owned and delivered by private developers. HMG does have facilities to support debt through provision for guarantees, however, at this stage of the market, we do not consider this type of support to be required.

The NZHF will not provide funding for operational expenditure as any support for this would be available through the Hydrogen Business Model and the RTFO.

Based on initial informal stakeholder feedback and our learnings from other similar funds, loans may not go far enough in removing the risks and barriers that have been identified by the NZHF (see section 1.3: challenges to scaling up hydrogen production). With equity (joint venture), this is a more long-term engagement, so projects targeted are unlikely to benefit from this type of investment. Capital guarantees are not something that are routinely offered by government due to the complexity of management of these schemes.

Our experience from other schemes such as the IETF and evidence gathered from stakeholders, such as surveys of businesses' perceptions of barriers, has shown that capital grants would be the most effective form of support for these types of projects. We are therefore proposing that the NZHF offers capital grant funding to support the deployment of low carbon hydrogen production projects. We would like to understand how specific projects could benefit from grant funding to support development costs. Please refer to section 3.2 for more information and questions on this.

Questions

5. **Noting the importance of revenue support which could be covered by the Hydrogen Business Model, do you agree that capital grant funding is the most effective option for low carbon hydrogen projects to come forward? Please explain your answer.**
6. **If capital grants were not available, would you consider applying for government loan funding?**

3.2 Type of activity

3.2.1 Building new hydrogen production facilities

We have considered whether the NZHF can usefully be spent co-funding the construction of new production facilities.

Commercially deploying low carbon hydrogen production during the lifetime of the NZHF is crucial if we are to meet our 5GW ambition by 2030. As such, the NZHF aims to provide projects with the required financial boost for construction to begin.

We recognise that first mover status also comes with risks and disadvantages, and that developers will face some challenges for early hydrogen projects, such as bearing some learning costs that can be harnessed by subsequent projects to manage risk. We want to share these risks with developers through positioning the NZHF to help guarantee and/or accelerate deployment by de-risking investment through Capital Expenditure (CAPEX) co-funding. We propose to do this by offering a percentage of the initial project cost estimate, including contingency.

We propose that the NZHF provide funding for CAPEX for projects which require revenue support, and for those which do not, as this reflects the distribution of the known pipeline of projects.

Capital co-funding for projects that will also require a hydrogen specific business model

With support from parallel funding policies, we expect a number of projects to be moving forward at scale in the UK during the spend period. Financial support (i.e., Hydrogen Business Model) for initial CCUS-enabled hydrogen projects could be allocated via the CCUS cluster sequencing process. Initial thoughts on allocation of the business model support contract for projects not eligible for that process are set out in the Hydrogen Business Model consultation.

Any projects selected through the CCUS cluster sequencing process are likely to see a Hydrogen Business Model as the main factor driving decisions towards FID. These projects may also benefit from NZHF funding to help lower the quantum of upfront costs and risks and contribute to reducing a project's internal rate of return (IRR) and lowering its financing costs.

This could result in a project overall requiring less support through a Hydrogen Business Model. We therefore propose that projects that require a hydrogen specific business model should be allowed to apply for NZHF capital co-funding, subject to meeting the relevant eligibility criteria. For the NZHF, we propose to run a series of competitions at intervals, which would be in conjunction with other government support mechanisms where possible.

Any decision to award NZHF funding will be subject to government satisfaction that subsidy control requirements have been met, government is comfortable with any balance sheet implications, all relevant statutory consents have been completed, and government is comfortable that funding represents value for money for the consumer in the context of other government support mechanisms.

Capital co-funding for projects that do not require a hydrogen specific business model to take FID

Current market intelligence indicates there are hydrogen projects that do not require revenue support access via a Hydrogen Business Model to take FID. We believe these are likely to be smaller, often electrolytic hydrogen projects which:

- expect to secure revenue support via the RTFO; or
- are proposing an end user for their hydrogen who will use it to replace an expensive counterfactual fuel e.g., diesel; or
- do not require revenue support because e.g., they are selling into an existing market; or
- are research and development projects, intended to demonstrate the hydrogen value chain in action from end-to-end in or as part of a novel process with future applicability across other projects.

We think there is value in delivering CAPEX to such projects via the NZHF where this enables deployment of commercially tested technologies. As set out in the Hydrogen Strategy, whilst our targets require a move to large scale deployment across the 2020s, we see smaller-scale electrolytic projects as playing an important role in the UK hydrogen economy in the early 2020s. We believe it is important we adopt the approach of “learning by doing” and begin deploying these projects, as well as any other new, low carbon hydrogen projects that do not require a hydrogen specific business model to take FID as soon as possible. This will deliver important technical learnings in the market, increase investor confidence, and provide a pipeline of projects to allow the supply chain to grow, which will be a crucial foundation to enable us to reach our 2030 hydrogen ambition.

We do not yet know what range of projects would come forward for this funding but anticipate that a decision to support projects which do not require a hydrogen specific revenue support model to take FID may in practice result in significant interest from transport projects that have secured revenue support via the RTFO. Whilst it is not our policy intention to prioritise certain end use sectors, we believe this outcome may be acceptable, noting:

- the heavy mobility sector is one of the highest value end use sectors of hydrogen (making overall subsidy requirements relatively small)
- transport is projected by the Hydrogen Strategy to be one of the largest users of hydrogen in 2030

- this approach will allow a quicker deployment of hydrogen projects than would otherwise happen if we were to wait until Hydrogen Business Models are allocated before delivering CAPEX to projects.

Questions

7. **Do you agree that CAPEX support through the NZHF will help projects to reach Final Investment Decision? Please explain your answer.**
8. **Do you know of any projects that may only want CAPEX support, without a requirement for a hydrogen specific business model, in order to take FID? If so, please give details of the project(s).**
9. **What reflections do you have on the approach we have identified to address the main challenges in building new hydrogen production facilities?**

3.2.2 Stimulating a future pipeline

The deployment of low carbon hydrogen production technologies which is both cost effective and at scale will require changes to operational processes. Typically, before such changes are made, a company will evaluate the feasibility and potential impact of a project. This is often done by conducting feasibility and FEED studies. These studies reduce risks and provide more accurate cost estimates, which enable informed investment decisions.

Companies face both financial and technical barriers to undertaking these studies, including difficulties raising the internal capital and third-party finance to fund them. Many companies also lack the technical staff needed to conduct studies or to oversee the deployment of projects in-house.[11] This means they need to employ external consultants, increasing costs. We recognise that some companies will require support to address these barriers.

One option to prevent a gap between First-of-a-kind (FOAK) and Nth-of-a-kind (NOAK) projects and boost the project pipeline before 2030, is for the NZHF to offer development support (DEVEX). DEVEX refers to the type of funding that is associated with a project before the project starts to build.

What type of projects could we support?

DEVEX could come into play at a number of stages in a project's life cycle including:

- **Feasibility and Pre-FEED:** The earliest stage of development where the technical and commercial viability of a project are first being examined.
- **FEED**: To build on the feasibility and pre-FEED work to achieve a fully worked through project.

[11] BEIS, 2015, Industrial Decarbonisation and Energy Efficiency Roadmaps to 2050: Cross-sector summary. Available at: https://www.gov.uk/government/publications/industrial-decarbonisation-and-energy-efficiency-roadmaps-to-2050

- **Post-FEED/Pre-FID**: Funding at this stage could allow projects to begin work normally undertaken after reaching FID such as planning applications, site preparation works or any other costs that are able to be capitalised within the capitalisation policy of the recipient.

We propose to offer grant co-funding to companies conducting feasibility and FEED studies. This would be specifically for companies to procure the specialist support they need to conduct feasibility and FEED studies and deploy projects. This may be engineering and technical consultant support, or project management expertise.

Additionally, grant co-funding may be provided to support with post-FEED costs for projects seeking support via a Hydrogen Business Model.

Project types

Government is already funding the innovation of new hydrogen technologies via targeted Innovation Funding (see section 1.2: Policies to support hydrogen production), however it is targeted primarily at FOAK projects. It is recognised that at this stage of market formation government support for DEVEX could aid even established technologies.

DEVEX would be allocated to projects which can demonstrate a viable path to delivery on top of meeting in the eligibility criteria for the full NZHF.

Questions

10. **Do you agree that there is a need/demand for government intervention to support hydrogen production projects with their development costs?**
11. **In light of available funding sources for project development, at what stage of the project life cycle would government support ensure the most effective use of the NZHF's resources and why?**

4. NZHF Delivery

4.1 Eligibility and project assessment criteria

We propose the following eligibility and assessment criteria for projects that apply to the NZHF. Eligibility criteria serve several functions. They help ensure financial support is aligned with the NZHF's strategic objectives, provide clarity to market participants on what projects could potentially receive financial support, and can also discourage speculative applications. Our proposed eligibility criteria are designed to ensure applicants to the NZHF are credible, new low carbon hydrogen projects in the UK.

The assessment criteria will be used to test a project's appropriateness for NZHF funding and to ensure the projects that are selected best advance the NZHF's objectives. Weightings will be assigned to the detailed assessment criteria to allow projects to be scored fairly. The weightings will be set out in detail in the application guidance.

Economic benefits

We propose to require applicants to demonstrate the socio-economic and industrial benefits of projects. As noted in the hydrogen strategy, we want to see opportunities for the UK supply chain businesses, technologies, and people to benefit from the growth of the hydrogen economy. As set out below, we propose to introduce assessment criteria to ensure that project developers are offering fair opportunities for the supply chain, investing in relevant skills, and ensuring good quality jobs are created. We intend to provide more detail on this aspect of the assessment later this year, in advance of NZHF applications opening.

We anticipate that over time this aspect of the assessment will evolve, as the now nascent hydrogen market develops, potentially in the direction of the model of other established low carbon sectors such as offshore wind.

Minimum grant size

We recognise the urgent need to bring forward low carbon hydrogen production in the immediate term and so do not propose setting a minimum grant threshold for the NZHF, which could act as a barrier to smaller-scale project deployment.

However, we will keep this under review as the hydrogen market develops. It is possible that we may choose to introduce a minimum grant threshold at a later stage to ensure we are bringing forward larger projects which will achieve the scale up required to meet our 2030 ambition and do so at affordable costs by harnessing economies of scale.

Table 5 – proposed eligibility criteria

Proposed criteria	
New low carbon hydrogen production projects	Bids will be required to demonstrate they: • Are creating additional hydrogen production. • Are creating low carbon hydrogen, to be defined by the low carbon hydrogen standard under development within BEIS. The standard is intended to be finalised in early 2022, ahead of the NZHF opening, and is being consulted on alongside this consultation. For further information please see the Low Carbon Hydrogen Standard consultation.
Geographical scope	• Projects must be based in the UK.
Technology readiness	• Projects must be using core technology that is proven and has been tested in a commercial environment. These are projects with a Technology Readiness Level (TRL) of 7 or more, and ensures our funding picks up where the innovation funding (set out in Table 2) ends.
Offtaker	• **Projects that are applying for CAPEX:** projects must prove they have an agreement in principle with an offtaker for some or all of their production volumes lined up. Application guidance will set out the minimum threshold of production volumes these agreements must cover. • **Projects that are applying for DEVEX:** projects must demonstrate demand for the hydrogen, in order to discourage speculative applications. • Primary offtaker must be ready to accept hydrogen by the projects target Commercial Operation Date.
Finance requirements	• Projects must demonstrate they have lined up the required private sector financial backing, which will be set out in application guidance. • Projects must demonstrate they are able to take FID within the required timeframe, which will be set out in application guidance. This will be within the timeline of the NZHF, i.e., 2025 or earlier. • Where RTFO is required to make a business case, applications must provide a provisional letter of approval from the Department of Transport (DfT) to be considered eligible.

Table 6 – proposed assessment criteria

Proposed criteria	
Scalability / replicability	• Whether the project could be replicated by others in the sector and/or is scalable.
Cost	• Whether the project will deliver cost-effective hydrogen and value for money.
Deliverability and risk	• Reasonable delivery schedule. • Appropriate risk assessment including mitigating actions.

Economic Benefits	• The extent to which a project can demonstrate it:
	  • Could deliver economic growth in places across the UK and contribute to the country's longer term industrial transformation to a green economy and by creating and maximising opportunities for investment and growth in local economies in the UK.
	  • Will deliver and support high skilled, high paid jobs and, in particular, develop a diverse workforce and deliver training to employees to attain the skills needed for hydrogen production in ways that minimise skill shortages and increase productivity.

Hydrogen market development and learning	• The extent to which the project offers growth opportunities in the production and usage of hydrogen.
Emissions reduction	• The extent to which the project delivers carbon savings to the economy and contributes to the UK government's 2030 hydrogen ambitions.

Questions

12. **Do you agree with the proposed high-level eligibility criteria for NZHF applications? Please expand your answer.**

13. **Do you agree with the proposed high-level assessment criteria for NZHF applications? Please expand your answer.**

4.2 Bidding system

We intend to launch the NZHF in early 2022 and we intend to run a series of competitions at intervals. This could help to ensure applicants who are unable to submit applications in spring 2022 still have an opportunity to apply later. Applicants would be required to complete an initial eligibility screening stage before being invited to submit a full application for NZHF funding. By ensuring that ineligible projects are identified prior to submitting a full application, we will minimise unnecessary work for applicants and NZHF assessors.

We will publish detailed application guidance closer to the NZHF's launch, which will set out the final eligibility and assessment criteria and information on how to apply.

Questions

14. Do you have any comments on the application process for the NZHF? Please explain any practical considerations the government should take into account when designing the final bidding system.

4.3 Potential Applicants

In order for us to understand the types of projects that may be looking for support from the NZHF, we are looking to gather some further information from potential applicants. The information you provide will not be used to assess any future applications to the NZHF.

Questions

15. If your organisation is likely to apply to the NZHF, could you please state whether you would be seeking capital or development support and the estimated size of the bid? If your projects require capital support, please also express this as percentage of the overall costs.

16. If you are seeking capital support, what stage of your construction are you looking to get funding for?

5. Geographic coverage of the NZHF

The UK government and the Devolved Administrations have a shared interest in adopting low carbon hydrogen production to meet net zero targets by 2050. The Government's Plan for Growth[12] sets out the levelling up agenda which will look to support the transition to new, high skilled green jobs and clean economic growth across the UK, including in vital industrial clusters. It will be important for all parts of the Union to work together in delivering this agenda, with the scaling up of the low carbon hydrogen economy at the heart of this.

There are already low carbon hydrogen policies being announced across the United Kingdom. HMG announced in March 2021 that it will invest £4.8m in the Holyhead hydrogen hub in Wales which will be designed to produce and distribute green hydrogen made using renewables for use in HGVs, helping to decarbonise high carbon-emitting transport. The Scottish Government has announced[13] £100m of funding for the hydrogen sector over the next five years, helping to drive a green recovery and transition to net zero. In addition, the Welsh Government consulted[14] on a pathway for developing the hydrogen energy sector in Wales with a view to publishing a Low Carbon Delivery Plan in November 2021. Furthermore, £11.2m was recently announced[15] to develop and manufacture low-cost hydrogen fuel cell technology for buses and create a hydrogen centre of excellence with Wrightbus in Ballymena, Northern Ireland.

The scope of this consultation is UK-wide. Our preferred approach is for the NZHF will be funded and delivered on a UK-wide basis to support decarbonisation across the UK. We will continue to work closely with the Devolved Administrations as we develop and finalise the design of the NZHF, with a particular focus on how the funding streams will interlink.

[12] Build Back Better: Our plan for growth:https://www.gov.uk/government/publications/build-back-better-our-plan-for-growth/build-back-better-our-plan-for-growth-html
[13] Building a new energy sector: https://www.gov.scot/news/building-a-new-energy-sector/
[14] Hydrogen in Wales consultation: https://gov.wales/sites/default/files/consultations/2021-01/hydrogen-in-wales-consultation.pdf
[15] Hydrogen for buses announcement: https://www.gov.uk/government/news/emissions-cutting-trucks-and-next-gen-hydrogen-buses-closer-to-hitting-the-road-with-54-million-government-led-funding

6. Subsidy Control

In general terms, a subsidy is a financial contribution using public resources which confers a benefit on the recipient. This could include, for example, a cash payment, a loan with interest below the market rate, or a loan guarantee. Subsidies are administered by all levels of government in the UK.

Any funding provided under the NZHF will need to be in compliance with appropriate subsidy control rules. As we finalise the eligibility and project assessment criteria for the NZHF, following consultation with stakeholders, we will be doing so in accordance with the appropriate subsidy control rules. Any decision to award funding will be subject to the application of subsidy control requirements, any balance sheet implications, the status of any relevant statutory consents and that the project represents value for money for the consumer.

If awards are made in Northern Ireland and are in scope of Article 10 of the Northern Ireland Protocol, EU State aid rules will apply.

7. Next steps

We will use the responses to this consultation to inform the policy design of the NZHF. We will also be holding virtual stakeholder events in September to gather feedback.

We will publish a summary of responses to this consultation which will set out detailed scheme design and plans for implementation in due course.

We intend to launch the NZHF in early 2022.

A. List of Consultation Questions

1. **What wider benefits could the NZHF deliver, such as local growth and low carbon leadership opportunities?**
2. **Do you agree with the proposed scope for the NZHF?**
3. **Are there any technologies for low carbon hydrogen production, other than CCUS-enabled and electrolytic hydrogen, that you think could begin production of low carbon hydrogen during the early 2020s? Please give details.**
4. **What boundary should the NZHF set around production projects? Please explain your rationale, including any considerations that may change over time and / or vary according to the types of projects.**
5. **Noting the importance of revenue support which could be covered by the Hydrogen Business Model, do you agree that capital grant funding is the most effective option for low carbon hydrogen projects to come forward? Please explain your answer.**
6. **If capital grants were not available, would you consider applying for government loan funding?**
7. **Do you agree that CAPEX support through the NZHF will help projects to reach Final Investment Decision? Please explain your answer.**
8. **Do you know of any projects that may only want CAPEX support, without a requirement for a hydrogen specific business model, in order to take FID? If so, please give details of the project(s).**
9. **What reflections do you have on the approach we have identified to address the main challenges in building new hydrogen production facilities?**
10. **Do you agree that there is a need/demand for government intervention to support hydrogen production projects with their development costs?**
11. **In light of available funding sources for project development, at what stage of the project life cycle would government support ensure the most effective use of the NZHF's resources and why?**
12. **Do you agree with the proposed high-level eligibility criteria for NZHF applications? Please expand your answer.**
13. **Do you agree with the proposed high-level assessment criteria for NZHF applications, and in particular? Please expand your answer.**
14. **Do you have any comments on the application process for the NZHF? Please explain any practical considerations the government should take into account when designing the final bidding system.**
15. **If your organisation is likely to apply to the NZHF, could you please state whether you would be seeking capital or development support and the estimated size of the bid? If your projects require capital support, please also express this as percentage of the overall costs.**
16. **If you are seeking capital support, what stage of your construction are you looking to get funding for?**

B. Glossary

Acronym	Definition
CAPEX	Capital Expenditure
CB6	Carbon Budget 6
CCUS	Carbon Capture Usage and Storage
CCC	Climate Change Committee
DEVEX	Development Expenditure
FID	Final Investment Decision
FOAK	First of a Kind
FEED	Front End Engineering Design
GW	Gigawatt
HGVs	Heavy Goods Vehicles
ICC	Industrial Carbon Capture
IETF	Industrial Energy Transformation Fund
IRR	Internal Rate of Return
MW	Mega-Watt
MWh	Mega-Watt hours
NOAK	Nth of a Kind
NZHF	Net Zero Hydrogen Fund
RTFO	Renewable Transport Fuel Obligation
T&S	Transport and storage
t CO_2	Tonnes CO_2
TRL	Technology Readiness Level
TWh	Terawatt hours

Term	Definition
Ten Point Plan	Sets out the approach government will take to build back better, support green jobs, and accelerate our path to net zero.
Allocation	The process of allocating revenue support through the hydrogen business model.
Business model	The mechanism which Government proposes to establish to support producers of low carbon hydrogen.
Carbon Budget 6	Limits the volume of greenhouse gases emitted over a 5-year period from 2033 to 2037, taking the UK more than three-quarters of the way to reaching net zero by 2050.
Carbon Capture Utilisation and Storage	The process of capturing carbon dioxide from industrial processes, power generation, certain hydrogen production methods. The captured carbon dioxide is then either used, or stored permanently.
Carbon price	A cost applied to carbon pollution to encourage polluters to reduce the amount of greenhouse gases they emit into the atmosphere.
CCUS cluster sequencing process	The process by which CCUS industrial clusters are chosen, with two anticipated by the mid-2020s, and a further two clusters by 2030 as outlined in the 240Ten Point Plan.
CCUS-enabled hydrogen production	Low carbon hydrogen produced from-methane reformation with CCUS.
Counterfactual fuels	The main fuel currently used in an end use sector, which a low carbon alternative could replace.
Electricity Market Reform	A government policy to incentivise investment in secure, low carbon electricity, improve the security of Great Britain's electricity supply, and improve affordability for consumers.
Electrolysis	A hydrogen production process which involves using electricity to generate hydrogen from water, with no CO_2 emissions at the point of production. Low carbon hydrogen is created when low carbon electricity is used as the input fuel.
Electrolytic hydrogen production	Hydrogen produced from electrolysis.
First of a Kind	A facility, technology, or process considered to be in some way novel or untested in the market.

Term	Definition
Green Gas Support Scheme	A financial support scheme to incentivise the proportion of green gas in the grid, through support for biomethane injection by the process of anaerobic digestion.
Grey/Carbon intensive hydrogen	Hydrogen that is produced from unabated methane-reformation, commonly used in industrial processes.
Industrial Energy Technology Fund	A grant scheme for industrial businesses to implement energy efficiency and deep decarbonisation solutions. The fund covers feasibility and engineering studies and deployment of projects.
Low carbon hydrogen	Hydrogen that is produced with significantly lower greenhouse gas emissions compared to current methods of production – methods include methane reformation with CCUS or electrolysis using renewable electricity.
Methane-reformation	A process for hydrogen production in which methane is the input fuel.
Net Zero	Legislation passed by the Government to reduce greenhouse gas emissions to net zero by 2050.
Net Zero Hydrogen Fund	A £240m fund to support low carbon hydrogen production.
Nth of a kind	A facility, such as a power plant, using mature technologies and processes.
Renewable Heat Incentive	A fixed rate tariff designed to incentivise the use of renewable heat for both domestic and non-domestic properties.
Renewable Obligation	An obligation on licenced electricity suppliers to source an increasing proportion of the electricity they supply from renewable sources.
Renewable Transport Fuel Obligation	A requirement on suppliers of transport and non-road mobile machinery fuel in the UK to show that a percentage of the fuel they supply comes from renewable and sustainable sources.
Revenue support	The funding provided on an ongoing basis, for an agreed term, which would cover a proportion of operating costs and an appropriate rate of return on private sector capital invested.
Strike price	Reflects the pre-agreed production cost of low carbon hydrogen under a variable premium model.
Volume risk	A hydrogen production facility is unable to sell enough volumes of hydrogen to cover costs with reasonable confidence.

This consultation is available from: www.gov.uk/government/consultations/designing-the-net-zero-hydrogen-fund

If you need a version of this document in a more accessible format, please email enquiries@beis.gov.uk. Please tell us what format you need. It will help us if you say what assistive technology you use.