Department for Energy Security & Net Zero

Offshore hydrogen regulation

A consultation on legislative proposals for offshore hydrogen pipelines and storage

Closing date: 22 May 2023

April 2023

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

Contents

General Information

Why we are consulting

Hydrogen can support the decarbonisation of the UK economy, particularly in 'hard to electrify' UK industrial sectors, and can provide greener, flexible energy across power, transport and potentially heat. Hydrogen produced in the UK could create thousands of jobs across the country, and provide greater domestic energy security, lowering our reliance on energy imports. Analysis by the Department for Energy Security and Net Zero (DESNZ) for Carbon Budget 6 suggests 250-460TWh of hydrogen could be needed in 2050, making up 20-35 per cent of UK final energy consumption.

For these reasons, in the British Energy Security Strategy (BESS), the UK Government doubled its ambition to up to 10GW of new low carbon hydrogen production capacity by 2030, subject to affordability and value for money, with at least half of this coming from electrolytic hydrogen production. Hydrogen transport and storage infrastructure will be critical to enable this 10GW ambition, and related economic benefits. It will connect producers with consumers, and balance misalignment in supply and demand.

Both industry and the Government are keen to operationalise viable projects urgently. We already have a mature offshore regulatory system for other offshore energy activities. The purpose of this consultation is therefore to propose certain amendments to the existing system of offshore pipeline and gas storage regulation that will enable first of a kind (FOAK) offshore hydrogen projects to be realised. The legislative amendments proposed in this consultation do not cover onshore hydrogen regulation, nor offshore hydrogen production. This current limited consultation will not preclude future consultations - either on further amendments to existing regulation, or a more bespoke hydrogen regulatory solution.

In addition, there are laws covering planning, environment, pollution control, health and safety and other matters. Prospective hydrogen developers will need to obtain relevant seabed rights and carry out their own due diligence to ascertain which laws will apply. Different rules may apply depending on factors such as location and project design.

Consultation details

Issued: 24 April 2023

Respond by: 22 May 2023

Enquiries to:

Email: HydrogenTransportandStorage@beis.gov.uk

Or

Hydrogen Networks and Markets team
Department for Energy Security and Net Zero
5th Floor
1 Victoria Street
London
SW1H 0FT

Consultation reference: Consultation on legislative proposals for offshore hydrogen pipelines and storage

Audiences:

This consultation will be of particular interest to all parties involved in the offshore hydrogen economy:

- Hydrogen producers
- Hydrogen consumers
- Gas transporters
- Storage operators
- Investors
- Consumer champions
- Trade associations
- Academics

Territorial extent:

These proposals apply to the offshore areas of the United Kingdom - including relevant territorial seas and the United Kingdom Continental Shelf (UKCS). Department for Energy Security and Net Zero will work with the devolved administrations as we develop offshore regulation in order to ensure that our policies take account of devolved responsibilities.

How to respond

Your response will be most useful if it is framed in direct response to the questions posed, and with evidence in support wherever possible. Further comments and wider evidence are also welcome. When responding, please state whether you are responding as an individual or representing the views of an organisation.

We encourage respondents to make use of the online e-consultation wherever possible when submitting responses as this is the Government's preferred method of receiving responses. However, responses in writing or via email will also be accepted. Should you wish to submit your main response via the e-consultation platform and provide supporting information via hard copy or email, please be clear that this is part of the same consultation response.

Respond online at: beisgovuk.citizenspace.com/industrial-energy/offshore-hydrogen-regulation

Email to: HydrogenTransportandStorage@beis.gov.uk

Write to:

Hydrogen Networks and Markets team
Department for Energy Security and Net Zero
5th Floor, Victoria
1 Victoria Street
London
SW1H 0FT

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.

Chapter 1: Introduction

Context – The Hydrogen Economy

Hydrogen can support the deep decarbonisation of the UK economy, particularly in 'hard to electrify' UK industrial sectors, and can provide greener, flexible energy across power, transport and potentially heat. Hydrogen produced in the UK will create new jobs across the country, and secure greater domestic energy security, lowering our reliance on energy imports. Analysis by the Department for Energy Security and Net Zero (DESNZ) for CB6 suggests 250-460TWh of hydrogen could be needed in 2050, making up 20-35 per cent of UK final energy consumption.[1]

In 2021, the UK Government published the Net Zero Strategy, which sets out policies and proposals for decarbonising all sectors of the UK economy to meet our net zero target by 2050.[2] This supports the preceding publications of the Hydrogen Strategy, the Energy White Paper and the Prime Minister's Ten Point Plan, along with other notable publications that set out the development of the UK hydrogen economy as a UK Government priority. Building on the Ten Point Plan and Hydrogen Strategy, the British Energy Security Strategy (BESS) doubled our 5GW low carbon hydrogen production capacity ambition to deliver up to 10GW by 2030, subject to affordability and value for money, with at least half of this coming from electrolytic hydrogen.[3] In March 2023, the UK Government published Powering Up Britain.[4] Powering up Britain brings together the Energy Security Plan, and Net Zero Growth Plan, and sets out how the UK Government will enhance our country's energy security, seize the economic opportunities of the transition, and deliver on our net zero commitments.[5] These strategies combine near term pace and action with clear, long-term direction to unlock the innovation and investment critical to meeting our energy security and net zero ambitions.

Hydrogen transport and storage infrastructure will be critical enablers for the necessary growth in the hydrogen economy required to meet our 10GW ambition, which could support over 12,000 jobs in hydrogen production, distribution, and storage by 2030.[6]

The offshore hydrogen economy has the potential to utilise offshore energy infrastructure and the engineering expertise of workers from the oil and gas industry. Offshore hydrogen production could derive from offshore wind, with electrolytic hydrogen being produced offshore and piped onshore. Moreover, offshore hydrogen storage may be key to advancing the

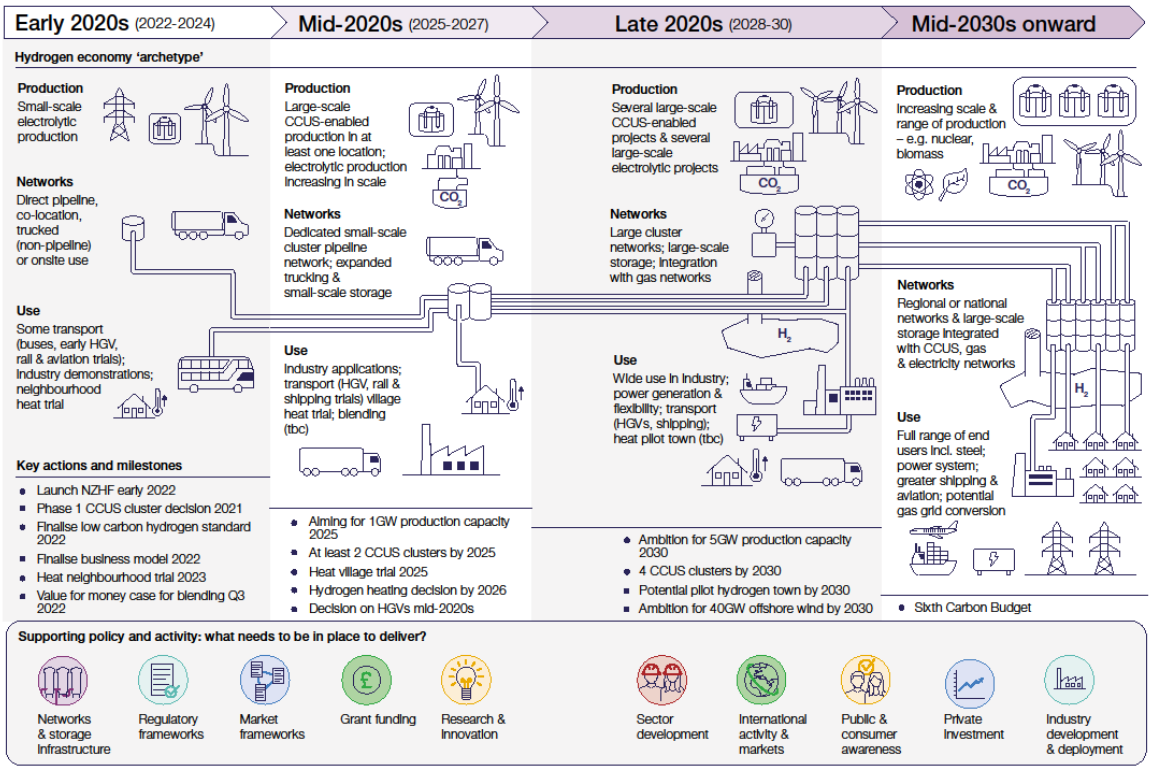
[1] Impact Assessment for the Sixth Carbon Budget (2021): https://www.legislation.gov.uk/ukia/2021/18/pdfs/ukia_20210018_en.pdf
[2] Net Zero Strategy: Build Back Greener (2021): https://www.gov.uk/government/publications/net-zero-strategy
[3] British Energy Security Strategy (2022): https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy
[4] Powering Up Britain (2023): https://www.gov.uk/government/publications/powering-up-britain
[5] Ibid.
[6] Internal BEIS analysis based on the Energy Innovation Needs Assessment (EINA) methodology with updated domestic and global scenarios; figures consider jobs linked to hydrogen production, distribution, and storage. EINA methodology provided by Vivid Economics (2019): https://www.gov.uk/government/publications/energy-innovation-needs-assessments

development of the hydrogen economy to achieve net zero by 2050.[7] As technical and economic proposals for the future offshore hydrogen economy still require further investigation, the significance of offshore infrastructure in the early growth of the hydrogen economy remains to be proven. Nonetheless, it is important that Government supports research and development projects to enable innovative findings and consider the potentially large value of the offshore hydrogen economy, in our efforts to achieve net zero.

The Hydrogen Roadmap

The Hydrogen Strategy included a roadmap that set out our vision for the expected growth of the hydrogen economy in the 2020s and beyond. The size and nature of the hydrogen economy and supporting network in 2050 will depend on several factors and policy decisions. This includes the roles of hydrogen across its different potential end uses in industry, power, transport and potentially heat. As summarised in the Hydrogen Economy 2020s Roadmap (Figure 1), we expect the hydrogen economy to reach regional and/or national scale transmission networks supported by both small and large-scale storage from the mid-2030s onwards.[8]

Figure 1: Hydrogen Economy 2020s Roadmap (Hydrogen Strategy)



[7] A quantitative assessment of the hydrogen storage capacity of the UK continental shelf (2021): https://www.sciencedirect.com/science/article/abs/pii/S0360319920347005?dgcid=author

[8] Hydrogen Strategy (2021): https://www.gov.uk/government/publications/uk-hydrogen-strategy. Note that the British Energy Security Strategy has since updated the hydrogen production capacity ambition for 2025 from 2GW/2030 to 10GW, and the offshore wind capacity ambition up to 50GW by 2030

This Consultation – Offshore Hydrogen Economy

In August 2022, Government published our Hydrogen Transport and Storage Infrastructure Consultation, which included a chapter on Regulatory Frameworks. Evidence from the responses to that document have been used to inform this consultation, but we shall provide a full Government response to the August 2022 consultation in due course.

This consultation focuses on two specific areas for legislative amendments that we believe will support effective regulation for the pipeline and certain storage elements of first of a kind (FOAK) offshore projects. The changes will cover: a) granting approval to construct and operate offshore pipelines; and b) licensing of offshore hydrogen storage. These changes would have the consequential effects of ensuring FOAK pipelines and storage fall within scope of the existing environmental assessment and regulation applicable to other offshore oil and gas projects. These amendments will be required to support project development and ensure that activities are conducted with proper regulatory oversight; with consideration for the environment and for other users of the offshore region; and are subject to decommissioning when activities are completed.

Industry is familiar with existing regulation for other offshore energy activities. We believe that the existing regulatory system has sufficient flexibilities to enable it to provide workable and effective solutions for FOAK offshore projects, pending any longer-term reform. DESNZ are following the Hydrogen Strategy Roadmap to ensure that Government will continue to work with industry and regulators in the early 2020s to identify and address regulatory barriers faced by FOAK hydrogen projects, as well as designing initial and more robust frameworks later in the decade. Our intention is to evolve the existing oil and gas framework to apply to hydrogen where suitable.

We shall not be consulting in this document on all areas that will be essential to the future offshore hydrogen economy. The future market framework and funding; offshore hydrogen production/manufacturing, and onshore regulation are not covered. Health and safety legislation also falls outside of the remit of this consultation. The Health and Safety Executive (HSE) is the independent regulator for workplace health and safety within Great Britain. The Health and Safety at Work Act (1974) and a large number of health and safety regulations extend to the offshore region (including the territorial seas and UKCS area). DESNZ are not seeking to make any changes to health and safety regulation via this consultation, but we will continue to work closely with HSE to ensure the existing offshore regulatory framework is suitable for offshore hydrogen projects.

This chapter does not, therefore, set out a comprehensive analysis of the existing offshore regulatory landscape. Instead, it provides an opportunity for stakeholders to comment on specific policy proposals to support FOAK projects and assist the development of pipeline and storage elements of future offshore hydrogen projects. DESNZ intends for these policy proposals to provide an initial approach to regulatory design for the offshore hydrogen economy, which will be operable for early projects. DESNZ will continue to work with the relevant governmental and/or regulatory bodies to keep all aspects of the regulatory framework under review - and ensure it remains robust as the hydrogen economy evolves. DESNZ further

recognises that, for any such regulatory framework to be effective, it will also need to account for wider issues, such as resourcing, funding, and time constraints. Further analysis on costs to business can be found in our accompanying de-minimis assessment. As offshore hydrogen is a rapidly developing field, DESNZ recognises that there may be future changes or developments that will need to be accounted for. This proposal does not pre-empt any future developments of the offshore regulatory framework.

Other forms of consent, licensing or exemption may be required depending on the particular form of hydrogen activity and project specifics. For example, provisions of the Gas Act 1986 may apply. Developers will need to seek their own legal advice on what project consent, licences and/or permits etc. may be needed to proceed.

Your feedback in this consultation will enable us to develop informed policy and legislation.

Chapter 2 covers proposed changes to enable the North Sea Transition Authority (NSTA) to grant Pipeline Works Authorisations for offshore hydrogen pipelines, and for the Offshore Petroleum Regulator for Environment & Decommissioning (OPRED) to operate a functioning pipeline decommissioning regime.

Chapter 3 sets out proposals to extend the NSTA's existing offshore gas storage licensing provision, to also include offshore hydrogen storage.

Chapter 4 highlights our proposals for environmental regulation of pipeline and storage elements of offshore hydrogen infrastructure. These do not require any additional legislative amendments but will be consequential on the two changes being made.

DESNZ will work with the devolved administrations in order to ensure that our policies take account of devolved responsibilities.

Chapter 2: Offshore Hydrogen Pipeline Construction & Use and Decommissioning

Brief History to Existing Regulations/Rationale for Change

As the low carbon hydrogen economy is in its relative infancy, there is an opportunity to understand how best government(s) and regulators can work together to ensure prospective projects are best informed on the offshore regulatory processes they must consider and follow. The UK Government intends to work closely with devolved administrations to understand the best way to optimise hydrogen project development across the whole of the UK.

Offshore oil and gas pipelines have been in operation since the 1960s, particularly in the UKCS. Pipelines have been critical to the transportation of oil and gas from production sites/facilities to shore, for commercial and non-commercial use. Regulation has evolved to create a UK-wide regime today that has attracted significant levels of investment, created jobs, and boosted the UK's security of supply.

The NSTA is the UK regulator responsible for authorising the construction and use of offshore oil and gas pipelines in the UKCS, under Part 3 of the Petroleum Act 1998. The NSTA is the business name of the Oil and Gas Authority, a company given functions under the Energy Act 2016. The NSTA has well established technical processes and expertise to regulate offshore oil and gas activities. Currently, offshore pipelines carrying oil, relative hydrocarbons, natural gas (including such gas as a liquid) and carbon dioxide are regulated by the NSTA.

The environmental regulation and decommissioning of offshore oil and gas assets is the responsibility of the Secretary of State through OPRED.

Current Regulatory Assessment

The current regulatory framework for offshore oil and gas pipeline construction and use is mostly governed by the Petroleum Act 1998. A Pipeline Works Authorisation (PWA) is required to construct and use new subsea pipelines in the UKCS and territorial seas. PWA applications are made to the NSTA via the PWA Portal system, with supporting technical, operational, and geographical data that relate to the system operation and efficiency of pipelines to be authorised. Throughout the PWA process, the NSTA work closely with relevant authorities, such as the HSE and OPRED, to share relevant technical information and to seek input on the PWA application.

This process is set out under Part 3 of the Petroleum Act 1998. The Petroleum Act 1998 (Specified Pipelines) Order 2011 specifies a description of pipelines for the purposes of section 24(2A) of the Petroleum Act 1998 (pipelines disregarded for the purposes of Part 3 of that Act etc.) as pipelines other than those used in relation to relevant substances. Relevant substances are defined as oil or relative hydrocarbons, natural gas (including such gas as a

liquid) or carbon dioxide. Pipelines other than those used in relation to oil, gas or carbon dioxide can therefore be disregarded for the purpose of Part 3 of the Act, meaning they do not require authorisation. Pipelines used in relation to oil, gas or carbon dioxide therefore do require authorisation.

Part 4 of the Petroleum Act 1998 (applied to offshore carbon capture usage and storage (CCUS) via section 30 of the Energy Act 2008), governs decommissioning of offshore installations and offshore pipelines.[9] The provisions for decommissioning of offshore oil and gas and CCUS installations protect the taxpayer from decommissioning liabilities. The Secretary of State, through OPRED, is generally the regulator although Scottish ministers have functions for decommissioning of CCUS infrastructure. There is a similar decommissioning regime for offshore renewables in the Energy Act 2004.

Part 4 of the Petroleum Act 1998 aims to ensure that those who have benefited from the exploitation or production of oil and gas bear the responsibility for decommissioning. Section 29 (s29) of the Petroleum Act 1998 enables the Secretary of State to serve notices requiring the recipient to submit a costed decommissioning programme for approval and to carry it out.

Specific Regulatory Proposal

DESNZ recognises the benefits of extending the current PWA regime administered by the NSTA to provide an operable regulatory regime for offshore hydrogen pipelines. As an initial approach to regulatory design for offshore hydrogen pipeline construction and use, the proposal is to make an order using the powers conferred by sections 24 and 25 of the Petroleum Act 1998. This would bring offshore hydrogen pipelines within scope of Part 3 of the Petroleum Act. The legislative change would grant the NSTA powers to issue PWAs for the construction and use of offshore hydrogen pipelines, and would contribute to our initial approach to design parts of the offshore hydrogen regulatory framework.

If offshore hydrogen pipelines are covered by Part 3 of the Petroleum Act 1998, then under existing provisions they would also fall within scope of the decommissioning provisions in Part 4 of that Act.

Question 1:

Do you agree with Government's approach to use the powers in Part 3, section 24 of the Petroleum Act 1998, to specify hydrogen pipelines to be covered by Part 3 of the Petroleum Act 1998. Please state "Yes" or "No" and your reasons why.

Question 2:

Do you agree with Government's proposal to bring offshore hydrogen pipeline decommissioning under Part 4 of the Petroleum Act? Please state "Yes" or "No" and your reasons why.

[9] There are similar decommissioning provisions for offshore renewable energy installations in Energy Act 2004.

Chapter 3: Offshore Hydrogen Storage Licensing and Decommissioning

Existing Regulation

The Energy Act 2008 provides for a licensing regime that governs gas importation and storage activities. Offshore gas storage activities require a licence from the NSTA under the Offshore Gas Storage and Unloading (Licensing) Regulations 2009 (the Gas Storage Regulations) (SI 2009/2813).

However, the definition of 'gas' within section 2(4) of the Energy Act 2008 does not include hydrogen. Therefore, the Gas Storage Regulations do not cover hydrogen.

Offshore hydrogen storage potential will require technical and geological investigations into the suitability of the location and design. DESNZ wishes to use existing regulatory mechanisms to enable realisation of FOAK projects, but will be reviewing whether these are sufficient and suitable for the complex range of projects that we anticipate could develop in the future.

Specific Regulatory Proposal

As part of our initial approach to designing the offshore hydrogen economy, we are proposing to make regulations to designate hydrogen as a gas under section 2(4) of the Energy Act 2008. This will enable the NSTA to issue offshore licences for any activities listed under section 2(3) of that Act, including offshore hydrogen storage. This proposal does not pre-empt any future developments of the offshore regulatory framework, and work will continue in respect of offshore hydrogen production and storage.

Designation under section 2(4) of the Energy Act 2008 would mean that a hydrogen storage would fall under the definition of "offshore installation" in section 44 of the Petroleum Act 1998. As a consequence, the installation would then be subject to the decommissioning regime in Part 4 of that Act.

Question 3:

Do you agree with Government's proposal to make a statutory instrument designating hydrogen as a gas under section 2(4) of the Energy Act 2008? Please state "Yes" or "No" and your reasons why.

Question 4:

Do you agree that hydrogen storage installations should be subject to decommissioning under Part 4 of the Petroleum Act 1998? Please state "Yes" or "No" and your reasons why.

Question 5:

Are there additional issues with future offshore hydrogen storage regulation that need to be addressed? Please state "Yes" or "No" and your reasons why.

Chapter 4: Offshore Hydrogen Pipelines and Storage - Environment

Brief History to Existing Regulations

As noted in Chapter 2, the Petroleum Act 1998 is the principal legislation governing a consenting regime for submarine pipelines (Part 3), as well as decommissioning of offshore installations and pipelines (Part 4) in the territorial seas and UKCS. This is supplemented by the Energy Act 2008.

The Offshore Oil and Gas Exploration, Production, Unloading and Storage (Environmental Impact Assessment) Regulations 2020 ("the 2020 Offshore EIA Regulations") apply to activities related to proposed offshore oil and gas exploration and production, gas unloading and storage, and storage of carbon dioxide ("offshore projects"). They make provision for the Secretary of State's consideration of the environmental impacts of proposed offshore projects when deciding whether to agree to the grant of consent for such projects.

The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 ("the Habitats regulations") provide the legislative framework for the protection of a national network of protected sites. The relevant provision of the Habitats regulations is Regulation 5 which requires that, before the grant of any licence, consent, authorisation or approval involving a proposed activity that is likely to have a significant effect on a relevant protected site, whether individually or in combination with any other plan or project, the Secretary of State must make an appropriate assessment (a Habitats Regulations Assessment) of the implications for the site in view of the site's conservation objectives.

Current Regulatory Framework

The 2020 Offshore EIA Regulations make provision for the Secretary of State's consideration of the environmental impacts of proposed offshore projects when deciding whether to agree to the NSTA's grant of consent for such projects. The 2020 Offshore EIA Regulations require that projects listed in Schedules 1 – 3 are subject to Regulations 5 – 7 before the Secretary of State can agree to the grant of consent by the NSTA for the project. The projects listed under these Schedules 1 – 3 refer to pipelines for the transport of oil, "combustible gas" or chemicals. For these purposes, combustible gas means any combustible substance which forms a gas at normal pressure and temperature and which consists wholly or mainly of methane, ethane, propane or butane, as designated under section 2(4) of the Energy Act 2008.

Our proposal in Chapter 3 to designate hydrogen as a gas under this subsection would bring offshore hydrogen pipeline and storage in scope of the 2020 Offshore EIA Regulations.

The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 requires that the NSTA shall not grant any Petroleum Act or Energy Act licence, consent or authorisation

without the agreement of the Secretary of State. Where the Secretary of State considers that anything that might be done in accordance is likely to have a significant effect on a relevant site, he/she is required to make an appropriate assessment (a Habitats Regulations Assessment) of the implications for the site in view of the site's conservation objectives. This includes consulting appropriate nature conservation authorities. The Secretary of State will generally not agree to the grant of consent unless he/she is satisfied there will be no adverse effect on the site, although the Secretary of State can do so if there are imperative reasons of overriding public interest.

By requiring hydrogen pipelines to be covered under the PWA regime for their construction and/or use, as proposed in Chapter 2, the provisions of the Habitats Regulations would apply and a habitats consideration would be required to be undertaken by the Secretary of State before a PWA is granted by the NSTA. These Habitats Regulations would also apply to an installation carrying out any activity listed under section 2(3) of the Energy Act 2008, including gas storage.

Specific Regulatory Proposal

This consultation proposes no specific legislative changes in respect of the environmental regulations described above. This does not preclude those regulations being reviewed as part of other workstreams.

Next Steps

The purpose of this consultation is to ensure that ongoing policy development on offshore hydrogen regulation takes in to account all relevant considerations in meeting the policy objectives that government initially set out and summarised above and that all stakeholders have the opportunity to provide relevant feedback.

The consultation will be open for **4 weeks closing on 22 May 2023**. The department will analyse all responses to identify if we have overlooked any aspects that may inhibit the application of policy and address any relevant points made by stakeholders to ensure we can fully achieve our policy aims. We aim to publish our response to this consultation alongside a summary of the responses received in **Q3 2023**.

On-going engagement will form an important part of our work. We intend to continue to engage with stakeholders through working groups, forums and bilateral meetings.

This consultation is available from: www.gov.uk/government/consultations/proposals-for-offshore-hydrogen-regulation

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