

Hydrogen projects: regulation and consents

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Practice notes | **Maintained** | England

A practice note providing a reference guide for developers, public and private funders, and offtakers, setting out the key regulations and required consents in relation to a hydrogen project in England.

Scope of this note

This note provides a reference guide for developers, public and private funders, and offtakers, for progressing a hydrogen project in England. The note identifies the key regulatory milestones in the currently fragmented legislative field in England (although many of these are the same elsewhere in the UK, some of the regimes and responsible authorities differ in Wales, Scotland and Northern Ireland). At each stage, this note identifies the main regulatory and licensing requirements that parties must navigate and the main bodies they have to deal with.

For more information about the energy transition and the role that hydrogen will play, see [Practice notes, Energy transition in the oil & gas sector: overview](#) and [Downstream gas industry: the role of hydrogen](#).

Status of the hydrogen regulatory regime

Hydrogen forms a key part of the government's strategy to transition the UK from an energy system based predominantly on fossil fuels to a low (or zero) carbon, smarter and flexible energy system.

There is currently no comprehensive regulatory framework for the production, transportation and storage of hydrogen. Any party undertaking a hydrogen project in the UK currently faces a minefield of fragmented legislation and regulation, since the existing rules and policies were enacted before the emergence of hydrogen as a realistic fuel source.

In August 2021, the [Department for Business, Energy and Industrial Strategy](#) (BEIS) published the UK hydrogen strategy, together with a series of related consultations. The hydrogen strategy recognises the need to introduce a new legal and regulatory framework to support hydrogen's continued development.

Planning

Planning regimes for hydrogen projects

There is currently no dedicated planning regime for hydrogen projects. The UK hydrogen strategy states that the government aims to have planning and permitting regimes in place before 2024. In the meantime, the regimes applicable to the chemical and gas processing industries, as well as power generation and carbon capture and storage

(CCS), may all be relevant. Depending on the size, location and type of the intended development, a hydrogen project may require:

- Development consent under the *Planning Act 2008* (PA 2008) (see *Nationally significant infrastructure projects*).
- Express planning permission under the *Town and Country Planning Act 1990* (TCPA 1990) (see *Planning permission under TCPA 1990*).
- *Section 36* consent under the Electricity Act 1989 (see *Consent under section 36, Electricity Act 1989*).

Nationally significant infrastructure projects

The *PA 2008* introduced a system of unified development consent for major infrastructure projects, known as nationally significant infrastructure projects (NSIPs).

Section 14 of the PA 2008 sets out the types of large infrastructure projects that may qualify as NSIPs, depending on whether they meet the relevant thresholds set out in *sections 15 to 30*.

The following types of energy projects may qualify as NSIPs, provided they meet the relevant thresholds:

- Power stations. For more information on the NSIP thresholds for onshore and offshore power projects, see *Practice note, Power projects in England: which planning regime?*.
- Above-ground electricity lines.
- Liquid natural gas facilities.
- Gas storage and reception facilities.
- Gas pipelines.

(*Section 14(1)(a)-(g)*.)

The relevant thresholds for the different types of energy project are set out in sections 15 to 21. Some provisions apply to projects in England only, others to projects in England and Wales.

A hydrogen project that is, or includes, any of the above types of energy project and meets the relevant thresholds is an NSIP and requires a development consent order (DCO).

The Secretary of State for BEIS is the decision-maker for energy-related NSIPs in England (onshore and offshore). The Planning Inspectorate's National Infrastructure Planning unit is responsible for examining applications for development consent for NSIPs and makes a recommendation to the Secretary of State (*Planning Inspectorate: National Infrastructure Planning*).

For more information on:

- Making an application for development consent for an NSIP, see *Practice note, NSIPs: planning applications for nationally significant infrastructure projects*.

- Examination procedures for NSIPs, see *Practice note, NSIPs: examination procedures for nationally significant infrastructure projects*.

An application for development consent for an NSIP can include consent for development associated with the NSIP, such as a grid connection or additional transmission infrastructure (*section 115, PA 2008*).

Associated development is determined on a project-by-project basis, taking into account the provisions of the PA 2008. For more information, see *Ministry of Housing, Communities & Local Government: Planning Act 2008: guidance on associated development applications for major infrastructure projects (April 2013)*. Applicants may choose to apply for planning permission for associated development under the *TCPA 1990* instead of including the associated development in their application for development consent.

For information on:

- The Energy National Policy Statements (NPSs), which set out the government's planning policy for NSIPs and are the primary consideration in determining applications for development consent for NSIPs, see *Practice note, Planning Act 2008: environmental implications: National Policy Statements (NPSs): general points*.
- The UK Marine Policy Statement and any relevant marine plan, which is a relevant consideration in an application for an offshore NSIP or an onshore NSIP next to coastal or inland waters, see *Practice note, Marine and Coastal Access Act 2009: environmental implications* and *Marine Management Organisation: Generating energy offshore*.
- The National Planning Policy Framework (NPPF), see *Practice note, Power projects in England: which planning regime?: National Planning Policy Framework (NPPF)*. The NPPF does not contain specific policies applicable to NSIPs. However, it is relevant to decisions on NSIPs because:
 - it may be an "important and relevant" matter for the Secretary of State when considering applications on NSIPs; and
 - it requires local planning authorities to work with other authorities to take account of the need for strategic infrastructure, including nationally significant infrastructure within their areas.

In September 2021, BEIS published a set of draft revised NPSs and launched a consultation on whether they provide a suitable framework to support decision-making for NSIPs (see *Legal update, Consultation on revised energy national policy statements*). The draft revised energy NPSs include references to hydrogen and state that the following hydrogen developments require consent from the Secretary of State:

- Hydrogen gas-fired electricity generating infrastructure with over 50MW capacity (*NPS for Natural Gas Electricity Generating Infrastructure (EN-2), paragraph 1.6.4*).
- A new hydrogen pipeline (whether or not the hydrogen is blended with natural gas) if it is expected to be:
 - onshore, over 800mm in diameter and over 40km in length, operating at a pressure over seven bar gauge, and conveying gas for supply (directly or indirectly) to at least 50,000 customers, or potential customers, of one or more gas supplier; or

- over ten miles long and would otherwise require authorisation under [section 1](#) of the Pipe-Lines Act 1962.

(NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4), paragraph 1.6.4).

- An underground hydrogen storage development (whether or not the hydrogen is blended with natural gas) if:
 - its storage capacity is expected to be at least 43 million standard cubic metres of gas or higher; or
 - it has a projected maximum flow rate of at least 4.5 million standard cubic metres of gas per day.

(NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4), paragraph 1.6.4).

In addition, an environmental impact assessment (EIA) is required as part of the procedure for seeking consent for most NSIPs (see [Infrastructure Planning \(Environmental Impact Assessment\) Regulations 2017 \(SI 2017/572\)](#)) and some smaller projects (for example, surface industrial installation) if the development exceeds 0.5 hectares and the project is "likely to have significant effects on the environment" ([regulation 2\(1\)](#) and [Schedule 2, Town and Country Planning \(Environmental Impact Assessment\) Regulations 2017 \(SI 2017/571\)](#)). For more information on when an EIA is required and the process involved, see [Practice notes, Environmental impact assessment \(EIA\): when do you need an EIA?](#) and [Environmental impact assessment \(EIA\): summary](#).

Planning permission under TCPA 1990

Planning permission under the [TCPA 1990](#) is required for smaller hydrogen projects (for example, an onshore power plant with capacity of 50MW or under), including most demonstration-scale projects.

Developers must obtain planning permission for "carrying out of any development on land" ([section 57\(1\), TCPA 1990](#)). It does not apply offshore, but it applies to the onshore elements of an offshore power project.

Planning applications are considered by the local planning authority, who decides the application and grants or refuses planning permission.

In certain circumstances, the Secretary of State can "call in" a planning application ([section 77, TCPA 1990](#)). The Planning Inspectorate makes a recommendation on the application to the Secretary of State, who grants or refuses planning permission.

Decisions are taken in accordance with each local authority's local development plan. The NPPF, government planning guidance and NPSs may also be material considerations in decision-making.

Larger onshore projects (except onshore wind) require a DCO under the [PA 2008](#) (see [Nationally significant infrastructure projects](#)), although a separate application for planning permission under the TCPA 1990 may be required for parts of the project that are not "associated development".

For more information on planning applications in general, see Practice notes:

- [Planning applications: an overview](#).
- [Planning permissions: an overview](#).

Consent under section 36, Electricity Act 1989

If a development consent under the *PA 2008* is not required, the developer must obtain a consent under *section 36* of the Electricity Act 1989 where the hydrogen project involves constructing, extending or operating a generating station that is:

- Onshore with a capacity of over 50MW.
- Offshore with a capacity of over 1MW and under 100MW.

Applications for section 36 consent for an onshore project are determined by the Secretary of State.

Applications for section 36 consent for an offshore project are determined by the Marine Management Organisation (MMO) (*section 12, Marine and Coastal Access Act 2009*).

The procedure for an application for a section 36 consent is set out in *Schedule 8* to the Electricity Act 1989 and the *Electricity (Offshore Generating Stations) (Applications for Consent) Regulations 2006 (SI 2006/2064)*.

When granting consent under section 36 of the Electricity Act 1989, the Secretary of State has the power to give a direction under *section 90* of the TCPA 1990 that planning permission is deemed to be granted.

The section 90 directions usually include most of the conditions that apply to the construction of the power station, so that they are enforceable by the local planning authority.

For more information, see *Practice note, Power projects in England: which planning regime?: Consent under section 36 of the Electricity Act 1989*.

Additional permits and consents

The developer must acquire access rights by agreement where third parties control necessary land. Otherwise, the developer must rely on compulsory purchase (powers to carry out compulsory acquisition are often incorporated into a DCO). Highway improvement works may be a condition of a DCO or planning permission.

Offshore projects may also require a marine licence from the MMO (see *Practice note, Marine and Coastal Access Act 2009: environmental implications: Part 4: marine licensing*).

An environmental permit under the *Environmental Permitting (England & Wales) Regulations 2010 (SI 2010/675)* may be needed for various activities at the construction, operation and transportation stages (see *Practice note, Environmental Permitting: regulation of industrial installations in England and Wales*). A hydrogen project is likely to be an "installation" requiring a permit under one or more categories, for example production of a "chemical" (hydrogen) at "industrial scale" (*Schedule 1*). Various environmental permits are currently in force for fuel cell manufacture. Permitting and enforcement functions are divided between the Environment Agency and local authorities.

For more information on related consents, see *BEIS: Consents and planning applications for national energy infrastructure projects*.

Licences

A licence issued by Ofgem under the Gas Act 1986 is required to ship, transport or supply hydrogen. Conducting any of these activities without a licence, or an applicable exemption, is a criminal offence (*section 5, Gas Act 1986*). No licence is needed purely to produce hydrogen, but production must be "unbundled" from transport and supply (*section 7(3A), Gas Act 1986*). For more information on hydrogen licensing, see *Practice note, Downstream gas industry: the role of hydrogen: Licensing*.

A licence (where required) includes provisions relating to the safe operation of the network and price controls. To obtain a licence, an entity must:

- Demonstrate a credible plan on how it will undertake the licensed activities.
- Allow Ofgem to carry out a risk assessment.

(the *Gas (Applications for Licences, Modifications of an Area and Extensions and Restrictions of Licences) Regulations 2019 (SI 2019/1024)*).

For more information, see *Practice note, Downstream gas licensing: overview: Licence applications*.

Production

Hydrogen production is subject to detailed safety rules. These include a duty on the operator or employer to eliminate and reduce risks from explosive and dangerous substances. The operator or employer must have a plan for how to deal with accidents, incidents and emergencies, and provide sufficient instruction and training.

Operations must comply with any environmental permit and planning conditions.

The primary regulators are the *Health & Safety Executive* (HSE), the *Environment Agency* and relevant local authority.

For more information, see *Practice note, Control of major accident hazards (COMAH) regime*.

Future legal framework for hydrogen production

The UK is expected to implement a legal framework for hydrogen production. If France's legal framework (published in April 2021) is anything to go by, the UK could classify "low carbon" or "renewable" hydrogen using a threshold for CO₂ emissions in its production, and introduce traceability guarantees to ensure end-user confidence in the renewable origins of gas supplied.

Storage

Regulation of hydrogen storage differs according to the quantities of hydrogen being stored.

A consent is required under the *Planning (Hazardous Substances) Regulations 2015 (SI 2015/627)* to store two tonnes or more of hydrogen.

There is a duty to implement safety plans, emergency plans and a Major Accident Prevention Policy under the *Control of Major Accident Hazards Regulations 2015 (SI 2015/483)* where the amount of hydrogen present on site is over the lower threshold (five tonnes).

Where between five tonnes and 50 tonnes of hydrogen are to be stored, the lower-tier duties apply. If the amount of hydrogen exceeds 50 tonnes, the upper-tier duties apply. For more information, see *Practice note, Control of major accident hazards (COMAH) regime: Lower tier and upper tier establishments*.

These rules are also likely to apply to hydrogen production and dispensing sites, not just dedicated storage facilities.

There are other rules, derived from EU law and policed by Ofgem, on ownership of and access to commercial gas storage facilities. For more information, see *Practice note, Downstream gas industry: overview: Gas storage*.

Transportation by pipeline

If a party plans to transport hydrogen through a pipeline, it requires a transporter licence issued by Ofgem under the *Gas Act 1986* (or a shipping licence where the hydrogen is sent through another transporter's pipeline network). For more information, see *Practice note, Downstream gas licensing: overview: Licensable activities*.

The party transporting hydrogen must adhere to pipeline requirements for design, construction, installation, operation, maintenance and decommissioning (*Pipeline Safety Regulations 1996*), as well as industry codes (such as the *Uniform Network Code*, *Retail Energy Code* and *Smart Energy Code*), which are binding on operators through conditions of licences issued by Ofgem (see above). It must also co-operate with its local distributor within the *National Transmission System*.

For more information on the gas industry codes and how to find them, see *Practice note, Finding and using the industry documents: electricity and downstream gas*.

Hydrogen transportation licensing in practice

The H100 Fife project dealt with transportation licensing by appointing a third-party shipper to take on ownership of the gas beyond the electrolyser, allowing Scotland Gas Networks plc (ScGN) to deliver and operate the regulated network components of H100 Fife without the need for derogation or exemption from its gas transporter licence.

Blending

A dedicated hydrogen pipeline network does not currently exist, so it might be necessary to transport hydrogen through the existing natural gas pipeline network by means of blending followed by offtake. The concentration of hydrogen in gas pipelines is limited to 0.1% (*paragraph 1, Schedule 3(I), Gas Safety (Management) Regulations 1996 (SI 1996/551)* (GSMR)).

Before doing so, the relevant parties must submit a safety case to the HSE.

Exemption to the blending limit

The HyDeploy project was the first UK hydrogen project to successfully apply for an exemption to the 0.1% limit under *regulation 11* of the GSMR. The parties involved are now permitted to inject a blend of up to 20% into a private gas grid in Keele under the exemption. Following the application in 2018, the HSE ultimately concluded that "it is satisfied that the health and safety of persons likely to be affected by the Exemption will not be prejudiced in consequence of it" and granted Cadent Gas Ltd the exemption.

An exemption takes the form of a certificate issued by HSE. An exemption may be subject to conditions and a time limit and may be revoked at any time by a further certificate (*regulation 11(1), GSMR*). It is speculated that the GSMR may be amended to allow up to 20% blending if the HyDeploy project is successful.

Transportation by road

Specific designs for tanks, cylinders and tubes are required to transport hydrogen under the *Pressure Equipment (Safety) Regulations 2016 (SI 2016/1105)*.

Existing standards need to be revised to allow higher vessel capacities, both in terms of volume and pressure.

Hydrogen transport is prohibited through ten road tunnels in the UK based on its classification under the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR).

Developing hydrogen logistics

Hydrogen haulage is quickly developing across Europe and Australia, with companies such as TrojanH2 Logistics now developing vehicles capable of hydrogen-specific molecular storage, haulage and distribution. One ADR-approved liquid hydrogen trailer is anticipated to be capable of holding around 55,000 litres (or nearly four tonnes) of hydrogen. This is to meet the need for secure, reliable and affordable logistics solutions to transporting hydrogen by road.

Retail

Ofgem regulates the retail gas market through supply licences which incorporate rules on smart meters, network price controls and guaranteed standards of performance. The *Gas (Calculation of Thermal Energy) Regulations 1996 (SI 1996/439)* operate by reference to natural gas (methane).

Storage and dispensing of fuels, including at retail filling stations, is governed by a variety of safety regulations, policed mostly by the HSE. Current rules govern liquefied natural gas and hydrogen fuel cells.

There is currently no legal requirement for hydrogen purity levels to an end purchaser.

A future framework will likely include information on payment in the UK for hydrogen transmission, connection fees and charges, or remuneration for hydrogen supplied or injected.

BEIS business models will assist with the distribution of hydrogen.

Accurate measurement of hydrogen is required at hydrogen refuelling stations to enable taxes to be levied.

Hydrogen metering

The domestic metering lead organisation for the H100 project in Fife (Ofgem's regulation of supply and metering covers the whole of Great Britain) has indicated that conventional diaphragm gas meters without smart metering functions should be suitable for hydrogen metering. However, they must be specific to hydrogen due to its lower volumetric calorific value when compared with natural gas. The meters must also be located outside of the building and contain additional safety devices to prevent accumulation of hydrogen gas indoors.

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