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Regulation & Licence Highway - Key milestones in UK hydrogen projects

Everyone involved in the design and implementation of hydrogen projects is eagerly awaiting the UK Government's Hydrogen Strategy, revealed in the 2020 Energy White Paper for publication in "early 2021". Meanwhile, an increasing number of hydrogen projects are already progressing towards final investment decisions with some commencing construction. There is currently no comprehensive regulatory framework for production, transportation and storage of hydrogen, leaving stakeholders facing a patchwork of rules and policies – including the Gas Act 1986 and other regulatory regimes - that were enacted before the emergence of hydrogen as a realistic fuel source and as a result, needs imaginative adaptation to meet the needs of this technology.

Against this less than ideal background, this article provides a quick-reference guide for hydrogen developers, public and private funders and off-takers, setting out a timeline for progressing a UK hydrogen project in the meantime. This identifies the key regulatory milestones in the currently fragmented legislative field, focusing on England and Wales (some of the regimes and responsible authorities differ in Scotland and Northern Ireland. There are also some, more minor, differences between England and Wales). At each stage we identify the main regulatory and licencing requirements that parties will have to navigate and the main bodies you will have to deal with. We also outline what regulatory reforms the Hydrogen Strategy might announce.

In this article, we are delighted to be working in conjunction with Gordon Nardell QC from Twenty Essex. Gordon specialises in energy, infrastructure and utilities disputes. Twenty Essex is one of the leading commercial barristers' chambers in England and we thank Gordon for his time and invaluable insight preparing this piece.

1. Planning and consents

- ✓ Development consent order (DCO) - from the Secretary of State - required for major hydrogen projects if power plant with capacity of over 50MW or in any other Nationally Significant Infrastructure Project (NSIP) category. Consenting decisions taken in accordance with relevant National Policy Statement (NPS).
- ✓ Planning permission - required for smaller hydrogen projects – e.g. power plant with capacity of 50MW or under, including most demonstration-scale projects. Decisions taken in accordance with each local authority's Local Plan. National Planning Policy Framework, government planning guidance and NPS consent may also be relevant.
- ✓ Environmental Impact Assessment (EIA) – required when seeking consent for most NSIPs and some smaller projects – e.g. "surface industrial installation" if the development exceeds 0.5 hectares, and the project is "likely to have significant effects on the environment".
- ✓ Access rights – must acquire by agreement where third parties control necessary land. Otherwise must rely on compulsory purchase (which may be incorporated into a DCO). Highway works may be condition of DCO or planning permissions.
- ✓ Primary regulators: Local Planning Authority, Planning Inspectorate/Secretary of State (Secretary of State consents offshore power plants between 1MW and 100MW under Electricity Act 1989 s. 36, rather than DCO process). Offshore projects may also require a marine licence from the Marine Management Organisation (MMO).
- ✓ An environmental permit under the Environmental Permitting (England & Wales) Regulations 2010 may be needed for various activities at the construction, operation and transportation stages. A hydrogen project is likely to be an "installation" requiring a permit under one or more categories – e.g. production of a "chemical" (i.e. hydrogen) at "industrial scale" (Schedule 1, Part 2, chapter 4). Various environmental permits are currently in force for fuel cell manufacture. Permitting and enforcement functions are distributed between the Environment Agency and local authorities.

2. Licences

- ✓ A licence under the Gas Act 1986 is required to ship, transport or supply hydrogen. No licence is needed purely to produce gas, but production must be "unbundled" from transport and supply.
- ✓ A licence (where required) includes provisions relating to the safe operation of the network and price controls. To obtain a licence, the entity must:
  - demonstrate a credible plan on how it will undertake the licensed activities; and
  - allow a risk assessment to be carried out.
- ✓ Primary regulator: Ofgem.

3. Production

- ✓ Detailed safety rules derived from EU ATEX Directives. Include duty on operator/employer to eliminate/reduce risks from explosive and dangerous substances. This involves a duty to make arrangements to deal with accidents, incidents and emergencies, and to provide sufficient instruction and training.
- ✓ Operations must comply with environmental permit and planning conditions.
- ✓ Primary regulators: Health & Safety Executive (HSE), Environment Agency/local authority.

The UK is anticipated to implement a legal framework for hydrogen production. If France's recently published legal framework (April 2021) is anything to go by, the UK could classify "low carbon" or "renewable" hydrogen via a threshold for CO_2 emissions in its production, and could introduce traceability guarantees to ensure end-user confidence in the renewable origins of gas supplied.

4. Storage

Storage is regulated depending on the quantities involved:

- ✓ Consent required under the Planning (Hazardous Substances) Regulations 2015 to store two tonnes or more of hydrogen.
- ✓ Duty to implement safety plans, emergency plans and a Major Accident Prevention Policy under the Control of Major Accident Hazards Regulations 2015 where the amount of hydrogen present on site is over the lower threshold (5 tonnes).

  Between 5 tonnes and 50 tonnes, the lower tier duties apply. If the amount of hydrogen exceeds 50 tonnes, the upper tier duties apply.
- ✓ Note that these rules are also likely to apply to hydrogen production and dispensing sites, not just dedicated storage facilities.
- ✓ There are also rules, derived from EU law and policed by Ofgem, on ownership of and access to commercial gas storage facilities.
- ✓ Primary regulators: Hazardous substances authority, Ofgem, HSE.

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5. Transportation by pipeline

- ✓ Transporter licence under Gas Act 1986 (or shipping licence where arrangements made to convey gas over a transporter's network).
- ✓ Adhere to industry codes (UNC, REC, SPAA, SEC).
- ✓ Adhere to pipeline requirements for design, construction, installation, operation, maintenance and decommissioning (Pipeline Safety Regulations 1996).
- ✓ Cooperate with your local distributor within the National Transmission Network.
- ✓ Primary regulators: Ofgem, HSE.

The H100 Fife project dealt with transportation licencing 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.

6. Blending

- ✓ A dedicated hydrogen pipeline network is some way off, so it might be necessary to transport hydrogen via 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%.
- ✓ Submit a safety case to HSE.
- ✓ Amendment likely to Gas Safety (Management) Regulations 1996 (GSMR) to allow up to 20% blending if HyDeploy project is successful.
- ✓ Gas Goes Green programme will assist with the future blending framework.
- ✓ Primary regulator: HSE.

The HyDeploy Project was the first UK hydrogen project to successfully apply for an exemption to the 0.1% limit under Reg 11 of 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 Limited the exemption. An exemption takes the form of a certificate issued by HSE. It is important to note that an exemption may be subject to conditions and a time limit, and under GSMR reg. 11(1) may be revoked at any time by a further certificate.

7. Transportation by road

- ✓ Specific designs for tanks, cylinders and tubes required to transport hydrogen: Pressure Equipment (Safety) Regulations 2016.
- ✓ 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 ADR rules (carriage of dangerous goods by road).
- ✓ Primary regulator: Department for Transport.

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 4 tonnes) of hydrogen. This is to meet the need for secure, reliable and affordable logistics solutions to transporting hydrogen by road.

8. Distribution

- ✓ 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 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 HSE. Current rules govern LNG and hydrogen fuel cells.
- ✓ Currently no legal requirement for hydrogen purity levels to end purchaser.
- ✓ Future framework to include information on payment in the UK for hydrogen transmission, connection fees/charges, or remuneration for hydrogen supplied/injected.
- ✓ BEIS Business Models will assist with the distribution of hydrogen.
- ✓ Accurate measurement of hydrogen is required at hydrogen refuelling stations. This will enable taxes to be levied.
- ✓ Primary regulator: Ofgem.

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 will have to be specific to hydrogen due to its lower volumetric calorific value when compared with natural gas. The meters will also have to be located outside of the building and contain additional safety devices to prevent accumulation of hydrogen gas indoors.

What can we expect next?

The UK Government's 2020 Energy White paper was long on ambition but short on the detail of specific changes in legislation and policy to facilitate investment in hydrogen projects. Each of the project milestones involves areas of risk where the promoters of projects must try to adapt existing regulatory regimes to the requirements of hydrogen projects. The current 0.1% limit on blending hydrogen for pipeline transportation is a hard-edged limit requiring ministerial action to amend legislation. In other areas the risk results from a policy vacuum. In the planning system, for example, the absence of specific local policies and explicit national guidance heightens the possibility of arbitrary decision-making based on misunderstanding of key features of hydrogen development such as the high safety standards that apply to installations.

Risk in turn adds to project cost, including higher cost of capital and the expense of legal advice on short-term workarounds. Not surprisingly, industry is looking to the forthcoming Hydrogen Strategy not only to re-state and amplify the government's ambitions but, crucially, to provide clarity on co-ordinated change to the various regulatory regimes, together with a timescale for the necessary steps.

The White Paper references specific steps, including a 2021 consultation on "hydrogen-ready" gas appliances, and commits government to "work with HSE" to enable pipline blending of hydrogen up to 20% by 2023 – the target date for the "Hydrogen Neighbourhood" trial. Meanwhile the European Commission's Hydrogen Strategy -- published in July 2020 -- sets a brisk pace. As well as proposing new funding streams, the Commission promises to "swiftly introduce" various EU-wide regulatory instruments including a common low-carbon benchmark for hydrogen production and reforms to the EU Emissions Trading Scheme. It sees blending as a temporary solution while dedicated hydrogen infrastructure is developed. It remains to be seen what the UK Hydrogen Strategy will tell us about how far the UK plans to go, and how quickly.

Conclusion

As is evident from the above quick reference guide, any party undertaking a hydrogen project in the UK currently has a minefield of fragmented legislation and regulation to deal with. While the UK is an early mover on hydrogen research and development, the need to navigate the current patchwork of legal and administrative regimes is negatively impacting project development and investment in the UK, with compliance cost and the need to find workarounds eating into the viability of innovative projects. It is important that the UK Government take the opportunity of its Hydrogen Strategy to significantly reduce the complexity and uncertainty surrounding hydrogen projects and assist the continued development of the hydrogen sector in the UK.

Ofgem are clearly alive to the difficulties faced by stakeholders. When engaged by the applicant for the H100 Fife project, Ofgem set out a spectrum of regulatory options to the applicant and ultimately issued a letter of comfort addressing the application of the Gas (Calculation of Thermal Energy) Regulations 1996 to hydrogen supply. This is a temporary solution, however, and when hydrogen projects grow in size and complexity it will be necessary to ensure that this and other elements of the regulatory regime are properly tailored to the characteristics of this fuel source.

Hydrogen and fuel cell R&D over the last number of years has enabled some of the earlier public safety concerns associated with hydrogen technology to be substantially allayed. The UK Government now must adapt the legal and regulatory framework which in its current state is significantly restraining development. Creating a specific regulatory body responsible for hydrogen projects would be a major step forward and would increase the confidence not only of investors and developers but also the UK public. We look forward to the Government's Hydrogen Strategy this year and hope the opportunity is not missed to deal in short order with the major constraints the current framework imposes on the sector.

Get in touch

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Staying in touch

Having already been instructed on a high number of UK and EU-based hydrogen projects, Stephenson Harwood has a leading team of specialist lawyers with true strength and depth of knowledge in all aspects of hydrogen production, storage and transportation in a broad range of sectors. If there is anything arising from our article, we are very happy to set up a Zoom call to discuss or alternatively, please email us. If you want to ensure you don't miss our future hydrogen updates, seminars and bulletins, please let us know that you would like to be added to our hydrogen mailing list.

Our hydrogen quarterly bulletin can be found here.

Our previous online hydrogen seminars can be found here: https://www.shlegal.com/insights/hydrogen-projects

- Episode 1 discussed the terminology, technology and why hydrogen is becoming an essential part of sustainable energy strategies.
- Episode 2 explored major UK hydrogen projects with hydrogen developers, who discussed feasibility studies, construction, production, storage, usage and other project considerations.

Further insights by Stephenson Harwood LLP can be found here.
We also have an information hub solely focussed on offshore energy which can be found here.

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