

Hydrogen and the law



Hydrogen: The road to decarbonisation?

If the world is to tackle climate change and slash greenhouse emissions so that global temperatures do not rise above 2 degrees this century (the central aim of the Paris Agreement), industry experts, governments and business leaders all agree that 'Green' or renewable hydrogen is central to that goal.

Traditional renewables such as wind and solar power suffer from intermittent production. Batteries offer a solution but they are bulky, use exotic materials and often have a short discharge period. Battery-equipped electric vehicles require an extensive infrastructure of fast charging points, creating pinch-points for existing infrastructure and barriers to adoption.

Hydrogen is an energy vector – not just a source of energy, which mainly produces water as a by-product of use, but a substance which can be used to store and transport energy. It can be integrated with much traditional hydrocarbon-based infrastructure such as natural gas pipelines and gas-fired central heating systems, and can be used to power vehicles from fork-lift trucks to buses. In short, hydrogen is the perfect complement to traditional renewables and battery storage.

The world is embracing hydrogen

On 18 November 2020, the UK Government announced its Energy Policy with a "ten point plan for a green industrial revolution", which included a requirement to generate 5GW of low carbon hydrogen production capacity by 2030; and a goal to "develop the first town heated entirely by hydrogen by the end of the decade".

This follows the publication of the European Commission's European Hydrogen Strategy and the industry-led European Clean Hydrogen Alliance. Germany, Australia, Japan and the USA have introduced similar strategies to increase R&D and accelerate the growth of renewable hydrogen.

The Future of Hydrogen

Hydrogen production is moving from "brown" and "grey" hydrogen – produced from natural gas or coal without carbon capture and storage (CCS) – to "green" hydrogen (using electrolysis powered by renewable electricity) and "blue" hydrogen (using natural gas and CCS). From the way in which energy is delivered to our homes, to how we fuel our cars, green & blue hydrogen has the potential to reformulate our worldwide energy consumption:

- Projects in the UK and elsewhere aim to adapt existing infrastructure and facilities to produce blue hydrogen using CCS, repurposed offshore hydrocarbon fields and existing pipelines to turn industrial complexes "net zero".
- A wide range of projects are focussed on using renewable energy to produce green hydrogen, including onshore solar farms; floating bulk hydrogen production facilities co-located with offshore wind farms; and offshore tidal hydrogen production facilities.
- Hydrogen fuel cell-powered cars are already being introduced to the market. Fuel cell cars have longer travel ranges and shorter refuelling times compared to EVs. In light of the UK government's announcement that it will ban all sales of new petrol and diesel cars by 2030, hydrogen vehicle production will inevitably escalate.
- Several pilot schemes are investigating injecting increasing amounts of hydrogen into the UK's existing natural gas transmission network, and eventually transitioning to 100% hydrogen use for domestic heating and cooking. Hydrogen produced from offshore or onshore renewable power generation can also be used to supply local communities.

Hydrogen & the law

The hydrogen revolution poses many legal questions. Some of the key areas for consideration include:

Regulation

How will the production, storage, transmission and distribution of hydrogen be regulated?

Some existing legislation, such as the Gas Act 1986, which applies to gases including those wholly or partly consisting of hydrogen, may still require adaptation to be fit for purpose. The use of onshore salt caverns as storage for hydrogen would need to be monitored for structural integrity and this would require amended legislation as the Energy Act 2008 does not currently include hydrogen as a regulated 'gas' for storage purposes. Offshore storage facilities which would likely be regulated by amended forms of offshore oil & gas legislation.

Funding

What are the procedures for tendering for Government funding and contracts? What are the rules for securing government funding for this new technology? What flexibility is there in negotiating government contracts?

The UK Government has announced that a consultation for hydrogen business revenue models for hydrogen production projects will begin in Q2 2021. It is likely that initial hydrogen production projects will receive support from the UK Government in the form of bilaterally negotiated contracts. Such projects will be eligible for funding from the Net Zero Hydrogen Production Fund

There are a plethora of government funding sources for other hydrogen related projects, such as industrial & transport fuel switching related funds. Those switching related funds specifically designed for hydrogen include the: Hydrogen Supply Competition, Hy4Heat Competition and Hydrogen for Transport Programme. There are also various subsidy and incentive models which could be applied to the hydrogen market, such as the: Contracts for Difference, Renewable Heat Incentive and Renewable Transport Fuel Obligation schemes.

Corporate, finance and commercial

Where complex and ground-breaking projects require equity and debt funding, how will they be structured? How will pricing models for CO2 offtake develop for blue hydrogen projects?

In order to attract private sector investment, hydrogen production projects will have to be structured in accordance with the norms expected for bankable and investable transactions in the energy and infrastructure sector. Long established principles for project development and finance transactions in such sectors will likely be adopted for hydrogen, covering government support, regulatory matters, commercial contracts, joint ventures, financing and corporate governance.

Feedstock and offtake agreements for green and blue hydrogen projects will need to be arranged, with substantial natural gas or renewable power supply arrangement made, for instance via corporate PPAs and VPPAs. Consideration for water supply for electrolysis, potentially via associated desalination projects in countries where water supply is constrained, and CO2 offtake arrangements.

Planning

What are the planning requirements?

Appropriate planning licences and approvals needs to be obtained for the construction of production and storage facilities, as well as access to extensive pipeline networks, including for the repurposing of existing infrastructure. How efficiently hydrogen projects are able to obtain Development Consent Orders via the Nationally Significant Infrastructure Projects process, as well as gaining Local Planning Approval via the Planning Act 2008 and Town & Country Planning Act 1990, will be of significant importance to the costs of such a project.

Hydrogen & the law

Trade and transportation

How will hydrogen be traded? Will trading hubs such as those for natural gas evolve and if so, to what extent will they be regulated? What contract types will become standard?

Trading between the UK and its neighbours using the current international gas transmission network may be complicated by the differing speeds at which Great Britain, the island of Ireland and continental Europe transition to hydrogen or hydrogen blends in their domestic markets. Additional distinct infrastructure may be required to transport gaseous hydrogen, or even liquefied hydrogen (LH2).

There are various regulations involved in the transportation of gas, such as the gas quality requirements set out in the Gas Safety (Management) Regulations 1996 and the access rules set out in The Gas Act 1986, which may need to be updated. There are also metering and billing rules currently governed by the Gas (Calculation of Thermal Energy) Regulations 1996 which will need to be considered.

Construction

What issues can arise in complex onshore and offshore construction projects developing this cutting-edge technology?

Are standard construction contracts appropriate and how can risks in these cutting edge projects be minimised? To create a viable hydrogen market the construction of a vast amount of interconnected infrastructure will be required. How will developers justify the outlay for constructing expensive new projects if other parts of the hydrogen market do not have the required infrastructure in place to create demand for hydrogen? The projects themselves also involve the integration of new and complex equipment such as hydrogen compressors, chillers, dispensers and storage, which may lead to significant cost, time and quality variation issues.

Health & Safety

What are the health & safety implications of a switch to a highly flammable gas with very small molecules and low viscosity which makes it prone to leakage?

What new tests and safeguards will be required, for example in hydrogen fuel cell cars or domestic boilers, where leaks could be disastrous? As hydrogen will be highly pressurised during transportation and storage, various regulations will be applicable, such as the: Pressure Systems Safety Regulations 2000, Pressure Equipment (Safety) Regulations 2016 and Equipment and Protective Systems for Use in Potentially Explosive Atmospheres Regulations 2016. Employers will also need to carefully consider their obligations under the Health and Safety at Work Act 1974 and Management of Health and Safety at Work Regulations 1999 as it relates to the risks of working with hydrogen.

Environmental

What environmental regulations will need to be considered and update?

In close connection with planning approvals, hydrogen production, storage and transportation will need to meet various environmental regulatory standards, such as: The Environmental Permitting Regulations 2016, Control of Major Accident Hazards Regulations 2015 (COMAH), Planning (Hazardous Substances) Regulations 2015 (Hazardous Substances Regulations) and the Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

How Clyde & Co can help

Clyde & Co has assembled a team of experts who are ready to advise on and close transactions in the hydrogen sector, and advise on novel legal and regulatory issues that this new and exciting frontier of zero-carbon energy will entail.

Regulatory

Our regulatory practice covers both advisory and contentious matters in the gas, power & renewables sector, including with regards to Regulated Asset Base infrastructure. We are geared to assist with the new regulatory environment for hydrogen and other low carbon industries.

Project development and financing

Our experts will advise clients on structuring projects in the hydrogen sector, negotiating documentation, securing finance and investment, and closing deals. We advise on all forms of project documentation, including license terms, concessions, and implementation agreements. We advise on all financing, hedging, and security documentation required for projects. We have worked extensively on common terms agreements, loan facility agreements, mortgages, pledges, and assignments of receivables.

Planning & consent

Delivering market-leading advice that secures permission for clients to pursue their commercial endeavours, our planning group has an impressive track record including complex and controversial strategic developments.

Procurement

Our public procurement team has a strong reputation for commercial, risk assessed procurement law advice. Our lawyers have led on some of the largest and most innovative projects in the market in recent years, across all types of joint ventures and private finance arrangements.

Corporate

Our corporate team advises clients on the whole spectrum of corporate work, including high-value crossborder and domestic mergers and acquisitions, joint ventures, debt and equity investment, venture capital and capital market transactions.

Commercial agreements

Our team have advised on and negotiated a wide variety of commercial agreements in the gas, power & renewables sector, including fuel and feedstock supply agreements, PPAs, development agreements, grid connection agreements, O&M agreements and carbon credit agreements.

Construction

With more than 150 projects & construction lawyers globally we have developed a long-standing reputation as one of the market leading law firms in the sector. We provide the full range of project, construction and property services.

Health, safety & the environment

Over the last 30 years, we have gained a reputation as the “go-to” law firm for HSE in the gas, power & renewables sector. We have a particular specialism in both risk mitigation activities and dealing with emergency response and crisis management.

Corporate & commercial disputes

Clyde & Co has one of the largest disputes practices globally and our team of specialist gas, power & renewables dispute resolution lawyers is renowned for its deep understanding of the complexities of the industry.

Marine & offshore

Clyde & Co offers the largest marine practice worldwide, with more than 170 marine lawyers in key hubs around the globe. The breadth and complexity of issues which affect the marine & offshore sector demands legal experts who truly understand the dynamics of this area.

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