



# HYDROGEN INSIGHTS

Part 7



INCORPORATING  
KIETI LAW LLP, KENYA



# Bird's eye view of global clean hydrogen developments: strategy, policy and legislation

BY STEFAN ZIMMERMAN AND JACKWELL FERIS

The policy and legislative landscape around hydrogen is rapidly changing in several jurisdictions around the world. There are countries that have been leading the call for greater decarbonisation of the global economy, with these countries having adopted hydrogen strategies (or being in the process of doing so) as part of their respective commitments to achieve their GHG emissions targets and goals by 2030 and 2050.

This is a high-level bird's eye view of what is happening with the development of policies and the regulatory frameworks for clean hydrogen in several jurisdictions.

## United Kingdom

The UK has released a Hydrogen Strategy as part of its commitment to reaching net-zero carbon emissions by 2050. The document sets out detailed plans to achieve a goal of 5GW of clean hydrogen by 2030.

## Key takeaways

**Hydrogen targets:** The UK has maintained its existing target of 5GW of hydrogen production by 2030. It will launch a €240 million Net Zero Hydrogen fund in early 2022 with a series of competitions at intervals. It plans to finalise the Hydrogen Business Model in 2022, aiming to award contracts in 2033.

**Contractual support model:** The UK Government has proposed a contractual support model to incentivise hydrogen production, borrowing heavily from the UK's Contract for Difference (CfD) regime for renewables. By using a contractual support mechanism similar to the CfD regime for renewables, the UK Government hopes that it will see a clean hydrogen revolution, akin to the success and rapid expansion of renewable power generation in the UK. Under this model, the UK Government has sought to mitigate two key risks: (i) market



price risk (the risk that production costs are high compared to the market price achieved); and (ii) volume risk (the risk that producers cannot sell enough hydrogen to cover their costs).

**Market price risk:** The UK has considered three methods for dealing with price risk, its preferred option appears to be the “*variable premium*” model. Similar to the CfD regime for renewables, the proposed “*variable premium*” model will aim to mitigate market price risk by topping-up producers’ revenue up to an agreed “*strike price*”. Where the hydrogen reference price exceeds the “*strike price*”, producers will be required to repay revenues down to the “*strike price*”. The effect of this is to provide producers with a stable revenue stream.

**Volume support:** The UK Government has considered a number of volume support options, including (i) availability-based payments, or (ii) acting as a backstop purchaser of last resort where a producer has been unable to sell minimum quantities due to low demand. The UK Government’s preferred approach to provide volume support is through sliding scale price support. This would involve higher price support where volumes sold are low. Sliding scale support would divide production levels into tranches, with different price support levels for each tranche, the aim being to achieve a minimum economic return at lower volumes sold.

**Demand focused policies:** the UK is considering a range of policies to create demand for hydrogen production, including:

- **Carbon pricing** – by strengthening the UK Emissions Trading Scheme pricing, the UK Government hopes to promote investment in low carbon technologies, including clean hydrogen.
- **Creation of a low-carbon hydrogen standard** – to support the demand for low carbon hydrogen by providing confidence to end users that the hydrogen purchased is a low carbon alternative to existing fuels.
- **Sector-specific policies** – for example, the Renewable Transport Fuel Obligation in transport, the Capacity Market in the power sector, and the Industrial Energy Transformation Fund in industry.

**Broad regulatory regime:** Further clarity is yet to be provided on licencing requirements and roles, for example, whether hydrogen production, storage and transportation will require a licence, and whether the national grid’s role as the gas transmission operator will be extended to encompass hydrogen, or whether a new regulated entity will be created. A review of the Gas Act of 1986 will also be launched to consider the future regulation of a gas industry that includes hydrogen.

**Hydrogen storage:** The strategy acknowledges the need to increase hydrogen storage infrastructure and to assess whether regulatory interventions are required.

## Japan

On 26 December 2017, Japan adopted a basic hydrogen strategy to represent its direction and vision for realising a hydrogen-based society and provides an action plan to achieve this.

### Key takeaways

By 2030, Japan aims to produce commercial-scale supply chains to generate 300,000 tonnes of hydrogen annually and reduce the cost of hydrogen.

From 2030 Japan aims to target international supply chains and produce hydrogen at a competitive international price.

To promote regulatory reform, the Government has identified technological development and co-operation with the private sector in the strategic development of hydrogen stations as important for increasing supply and reducing supply costs. This includes:

- Discussions about accelerating current initiatives based on the Regulatory Reform Implementation Plan, and considering a regulatory system based on the realities of hydrogen.
- Government to support hydrogen stations and other players in the market to reduce upfront investment costs and effectively promote the optimum location of hydrogen stations based on simulated demand.

Government and private sector to create standards for hydrogen station infrastructure and relevant equipment development and ensure that they are compatible.

To increase the significance of hydrogen use in the mobility sector and provide users with incentives for using hydrogen, the Government will consider a system to visualise the environmental value of hydrogen assessment and certification.

## Australia

Existing regulations already apply to industrial applications of hydrogen, however there is a need to prepare a legal framework for large-scale production and use of hydrogen as an energy carrier.

### Key takeaways

Currently, there is no targeted regulation for hydrogen production facilities in Australia. There is an existing framework of technical regulation (e.g. for the transport of gaseous materials) that provides broad coverage regarding the use of hydrogen and related technologies. Any hydrogen production facility will be governed by existing energy, water, gas and environmental regulations. However, given the increasing attention given to hydrogen by political parties and the renewable energy industry, regulatory reform is likely to occur in the near future. Considering this, and depending on the intended end-use application of the hydrogen produced by a facility, it is important to understand the current regulatory frameworks applying to: the export of hydrogen and related substances in Australia and the destination country; and, participation in the domestic gas market. While they are yet to be any introduced in Australia, hydrogen-specific standards are being developed internationally through organisations such as the International Organisation for Standardization and the International Electro-technical Commission. These standards remain voluntary unless codified as Australian law. However, it is important to consider these technical

standards when developing a hydrogen project as equivalent specifications between Australia and potential export markets can simplify processes and help to reduce costs.

Directly applicable laws include those applicable to hydrogen production, transport to market, use as a fuel, use in gas networks, safety, project approvals, environmental protection and economic effects of the industry.

The first stage would be for the Government to review existing legislation, standards, and regulations to determine whether their legal frameworks can support hydrogen safety and hydrogen industry development.

Government needs to agree on co-ordinated reviews of the existing legal framework to:

- Support the development of technical safety standards for the hydrogen industry, taking into account the role of Standards of Australia.
- Consider and evaluate, with the aim of developing a nationally consistent approach as far as practicable, a regulatory model to address and support both hydrogen safety and hydrogen development.
- Where necessary, amend existing legislation and regulations or draft new legislation to address hydrogen safety and support hydrogen industry development.

The Australian Government will follow the Council of Australian Governments' Principles of Best Practice Regulation for any new regulations associated with hydrogen.



The following factors have been noted regarding industry growth:

- **Collaboration** – aligning national and international regulations, considering the broader regulatory ecosystem. Governments should share expertise to promote consistent frameworks.
- **Fit for purpose** – taking a systems approach to regulation, focusing on outcomes and performance. Governments should ensure regulation is consistent with strategic objectives.
- **Flexibility** – recognising that, as the industry evolves, regulatory frameworks may require continuous adjustments. Governments should use adaptive, iterative approaches, and use standards, codes of conduct and other tools to allow flexibility.
- **Innovation** – fostering innovation and using models such as regulatory sandboxes and accelerators to test new ideas. Governments should be open to experimentation and new approaches to frameworks appropriate for an emerging industry.



Environmental regulatory considerations, should include:

- if the facility will engage any activity that may have a “*significant impact*” on a “*matter of environmental significance*” and whether the project requires approval under the Environment Protection and Biodiversity Conservation Act of 1999;
- whether any licences are required under federal and state legislation, e.g. an environment protection licence; and
- if reporting to the National Pollutant Inventory is required and any relevant reporting obligations which may apply.

**Storage and transport regulatory considerations:**

On-site storage of hydrogen post-production and subsequent transport off site is governed by multiple laws, regulations and codes at both the federal and state levels. Substances other than hydrogen may be present during the production

process and these may also be subject to such regulatory requirements. Key considerations regarding compliance, licensing and reporting obligations include:

- the presence of any “*dangerous goods or substances*” at a facility as prescribed under the Australian Dangerous Goods Code;
- which licences are required (if any) to store or transport any relevant dangerous goods or substances; and
- any technical standards which may apply to storage and transportation depending on the type and volume of any dangerous goods or substances, e.g. permissible types and specifications for storage conditions or tanks.

**Water for hydrogen electrolysis:** The production of “*green*” hydrogen requires water for the electrolysis process. A key challenge of production is sourcing and securing a sufficient volume of quality water. Relevant considerations include:

- any licensing or approval requirements for connecting to the relevant water network in the state or territory where the facility is located; and
- if using seawater, the relevant state licensing requirements regarding the operation of a desalination facility (including limitations on water temperature increases at the point of discharge, and brine management and disposal).

**Hydrogen project approval requirements:** As the current hydrogen projects are pilot projects, the approvals requirements have been regulated on a case-by-case basis by the relevant authorities under feasibility study, demonstration or pilot project regimes, enabling smaller-scale proof-of-concept testing without the need for lengthy formal assessments and approval processes. If the technology is proven, it is most likely that regulations will be amended to introduce a new category of energy specific projects and approval guidelines will be developed (as has happened for wind and solar projects).

Regardless of the regulatory approval pathway, given the potential for significant environmental and safety risks it is likely that these projects will be subject to comprehensive environmental assessments and public consultation regimes.

**Taxes and levies:** Most energy commodities produced are subject to taxation, excises, fees or levies. Hydrogen is not explicitly considered as an energy source in these regimes. As hydrogen production and use grows, appropriate taxation, excises, fees or levies could help ensure that the community shares in the economic benefits from developing a hydrogen industry. The Australian Government recognises the importance of the Australian public receiving a share of future benefits from a hydrogen industry and for investors to have certainty about future revenue arrangements.



## Canada

Canada has adopted a hydrogen strategy which lays out the hydrogen opportunity in Canada and an action plan to achieve certain targets by 2050.

### Key takeaways

The strategy notes that policy and regulation are a specific challenge because:

- There is a lack of comprehensive, long-term policy and regulatory frameworks that include hydrogen.
- Where certain policies are in place they are not consistent across regions, which slows down their adoption.
- The strategy states that a radical transformation of the energy sector requires a clear and co-ordinated regulatory and policy effort.

Certain policies should be implemented, including:

- Policies and regulations that encourage the use of hydrogen technologies such as low carbon fuel regulations, carbon pollution pricing, vehicle emissions regulations, zero emissions regulations, zero emission vehicle mandates, creation of emission free zones, and renewable gas mandates in natural gas networks.
- Codes and standards relating to hydrogen production and best practices need to be implemented across all regions. Such codes need to meet international standards in order to facilitate growth in the export and trade markets.
- There also needs to be implementation of codes and practices regarding blending hydrogen into the natural gas system.
- Canada is also working with countries around the world to develop and align codes and standards through efforts like the Canada-US Regulatory Cooperation Council.

## Germany

The legal and regulatory framework for hydrogen in Germany is not yet comprehensive. There is no consistent and complete framework covering the hydrogen value chain in the country. Regulations and definitions are lacking or unclear. A framework for carbon capture and storage necessary for the market launch of “blue” hydrogen is lacking completely. Even the fundamental question of whether and, if so, how the established regulatory system for gas should apply to hydrogen is still waiting for a reply. All of this will have to be tackled within the context of the implementation of the National Hydrogen Strategy.

### Key takeaways

#### **Construction of hydrogen production facilities:**

The construction and operation of a hydrogen production facility such as a power-to-gas plant requires the execution of an authorisation procedure pursuant to the Federal Emission Control Act. This encompasses a preliminary audit under the Environmental Impact Assessment Act. The requirements of the Hazardous Incident Ordinance also have to be fulfilled.

**Transportation:** The definition of “gas” in the Energy Act encompasses hydrogen as long as it is produced by electrolysis (power-to-gas).

Hydrogen produced by electrolysis also falls within the definition of “biogas” in the Energy Act, thereby profiting from the privileges for biogas concerning preferential network connection, network access and balancing.

Since hydrogen produced from electrolysis is defined as gas, pipelines transporting such hydrogen would qualify as gas supply networks under the Energy Act. To make things difficult, this applies to only distribution networks, since the definition of gas transmission in the Energy Act refers to the transmission of natural gas, thereby excluding hydrogen of any type.

Other types of hydrogen like blue hydrogen are not covered by these definitions at all. Consequently, they fall outside the scope of the Energy Act and its related regulations.

Pure hydrogen transmission networks are not covered by the existing regulatory framework.

As of today, a maximum of 10% hydrogen can be blended into the natural gas grid. According to the reports from the Technical Gas Association this share may be increased up to 20%.

As part of Germany's National Development Plan the TSOs have announced their intention to completely convert existing pipeline sections to hydrogen and to build new hydrogen trunklines.

**Network tariffs:** Under the Network Access Regulation, the injection of biogas (and hence hydrogen produced from electrolysis) into the gas transmission grid is free of charge. Under the regulation, the injection of gas (and hence hydrogen produced from electrolysis) into the local gas distribution network is free of charge.

Generally, facilities producing hydrogen from electrolysis are exempted from network access charges under the Energy Act.

**Draft Amendment to Energy Act Regarding the Regulation of Hydrogen Networks:** On 10 February 2021, the German Government passed the draft of an amendment to the Energy Act which contains new provisions for the regulation of hydrogen networks. The purpose of the amendment to the Energy Act is to gradually build up a hydrogen infrastructure in Germany. The provisions are intended as a transitional solution until corresponding European guidelines are available. The EU Commission has announced that it will present proposals on this by the end of 2021. Implementation into German law is expected from 2025 onwards.

So far there are only a few hydrogen pipelines in Germany that are not regulated as they are direct pipelines used for industrial purposes. According to the explanatory notes on the legislation, in view of this, there is no intention to subject existing or future hydrogen pipelines to mandatory regulation. Instead, this decision is to be left up to the pipeline operators. However, the German Government presumes that as more and more interconnected hydrogen networks are developed, there will be a need to subject them to comprehensive regulation.

The draft provides for the following framework conditions:

- In the definition of the term "energy" in section 3(14) of the Energy Act, hydrogen is fundamentally categorised as an independent energy carrier alongside gas. However, this is only intended to apply to pure hydrogen pipelines. For the blending of hydrogen into the natural gas network, the existing legal framework continues to apply on the basis that hydrogen produced by electrolysis falls under the definition of gas.
- According to section 3(39)(a) of the Energy Act, a hydrogen network is a network for the purpose of supplying customers with hydrogen which, in terms of its size, is not designed from the outset to supply specific customers or customers which are specifiable at the time when the network is constructed but which is, in principle, open for the supply of all customers. Industrial pipelines which connect a generation plant with dedicated individual consumption sites are therefore not covered by the Energy Act by their very definition.
- Section 28(j) of the Energy Act gives operators of existing networks and newly constructed networks a unique and irrevocable right to choose whether they want to be subject to the newly introduced regulation of hydrogen networks or not. This also applies to the conversion of natural gas pipelines to hydrogen. The right to choose applies to the operator in general and not to individual pipelines. Those who choose not to be regulated will not be covered by the requirements regarding network access, tariffication and unbundling as explained below.



According to section 28(n) of the Energy Act, network operators are required to grant access and connection to their hydrogen networks based on the principle of negotiated network access. The standardised contracts for regulated network access to the natural gas network, which have been continuously developed since 2006, therefore do not apply. Whether a correspondingly uniform contractual practice will nevertheless emerge remains to be seen.

Section 28(o) of the Energy Act provides for cost-based tariffication which is largely in line with the current legal situation. The conditions and tariffs must be reasonable, non-discriminatory and transparent. Application of the Ordinance on the Incentive Regulation of Energy Supply Networks is not planned but has not been completely ruled out. This is logical as benchmarking between network operators would not make sense in the beginning with only few operators to compare. A prerequisite for cost recognition is a positive needs assessment of the hydrogen infrastructure in accordance with section 28(p) of the Energy Act.

According to section 28(k) of the Energy Act, the operators of hydrogen networks must carry out separate accounting and bookkeeping for their networks (unbundling of accounts). This serves to avoid cross-subsidisation and discrimination. Particularly in the case of simultaneous operation of long-distance gas networks, the aim is to prevent costs for the hydrogen infrastructure being included in the transmission tariffs.

In accordance with section 28(m) of the Energy Act, hydrogen network operators may not construct, operate or own facilities for the production, storage or distribution of hydrogen. The requirements on informational unbundling also apply in the sense that the operator of a hydrogen network must be separated from an energy supply company in terms of its legal form is not prescribed.

Section 113(a) of the Energy Act regulates the transfer and continued application of rights of way and easements for gas pipelines. Under this provision, these also apply to the operation of these pipelines with hydrogen. This also applies, as a matter of principle, to concession agreements. This is intended to facilitate the transition from gas pipelines to hydrogen.

Transmission system operators can identify pipelines that could be converted to hydrogen in the framework of the Gas Network Development Plan in accordance with section 113b of the Energy Act. It must be ensured in this respect that the remaining network can meet the capacity requirements.

An independent Network Development Plan is to be drawn up for the hydrogen networks. The target year for this is 2035. This rejects the idea of joint network planning with the natural gas network.





## United States

There is currently no comprehensive hydrogen regulatory regime for the US. However, the US Department of Energy's (DOE) Hydrogen Program Plan suggests that it is starting with one in earnest.

### Key takeaways

The US Federal Government's major initiative regarding hydrogen as a fuel source has been to incentivise research in the area, including by funds made available through programmes in multiple agencies. One of the most important is the DOE's \$100 million pledge, which reflects its intention to invest up to this amount in two new DOE National Laboratory-led consortia to advance hydrogen and fuel cells technology research, development, and demonstration over the next five years. One consortium will develop affordable, commercial-sale electrolysers, which use electricity to divide water into hydrogen and oxygen, and the other consortium will assist in accelerating the development of fuel cells for vehicles, specifically for long-haul trucks.

In November 2020, DOE released its updated Hydrogen Program Plan, which underscores the DOE's department-wide commitment to facilitating the growth of hydrogen as a source of energy and provides a *"strategic framework for the department's hydrogen activities"*.

This is an important aspect of developing the hydrogen economy, however the Federal Government will need to incorporate hydrogen into its broader regulatory scheme for hydrogen to truly become part of the energy infrastructure in the US. Much of this may fall on agencies other than DOE. Several federal agencies already address hydrogen in their regulations; however, they only address it incidentally, as one of the many substances regulated under their regimes. For example, most environmental regulations on hydrogen deal with hydrogen's properties, such as its flammability/explosivity (which often requires it to be regulated as a hazardous substance). These regulations are scattered throughout the Code of Federal Regulations and are not organised to address hydrogen in a cohesive manner. Instead, disparate regulations touch upon a portion of the hydrogen industry or issues related to the characteristics of hydrogen itself, but do not focus on regulation of the hydrogen industry as a whole.

Currently, the federal agencies with the most extensive regulation of hydrogen are the Occupational Safety and Health Administration, EPA, and PHMSA. Hydrogen regulations are not a central part of these agencies' missions, but the agencies will continue to play an important role as hydrogen becomes more prevalent and technologies advance and change.



# Acronyms

AfCFTA	African Continental Free Trade Area
CfD	Contract for Difference
COP26	The 26 <sup>th</sup> UN Climate Change Conference of the Parties
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
EPRA	Energy and Petroleum Regulatory Authority
ESG	Environmental, Social and Governance
EU	European Union
GDP	Gross Domestic Product
GHG	Greenhouse Gas
HSRM	Hydrogen Society Roadmap for South Africa
IRENA	International Renewable Energy Agency
MENWA	National Environmental Management: Waste Act 59 of 2008
NDC	Nationally Determined Contribution
NEMA	National Environmental Management Act 107 of 1998
NEMAQA	National Environmental Management Act: Air Quality Act 39 of 2004
NWA	National Water Act 36 of 1998
PtX	Power to X
SEMA	Specific Environmental Management Acts
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
VAT	Value-added Tax
WUL	Water Use Licence

## OUR TEAM

For more information about our Industrials, Manufacturing & Trade sector and services in South Africa and Kenya, please contact:



### Jackwell Feris

Sector Head  
Director  
Industrials, Manufacturing & Trade  
T +27 (0)11 562 1825  
E jackwell.feris@cdhlegal.com



### Mashudu Mphafudi

Director  
Finance & Banking  
T +27 (0)11 562 1093  
E mashudu.mphafudi@cdhlegal.com



### Njeri Wagacha

Partner | Kenya  
T +254 731 086 649  
+254 204 409 918  
+254 710 560 114  
E njeri.wagacha@cdhlegal.com



### Tessa Brewis

Director  
Corporate & Commercial  
T +27 (0)21 481 6324  
E tessa.brewis@cdhlegal.com



### Megan Rodgers

Sector Head  
Director  
Oil & Gas  
T +27 (0)21 481 6429  
E megan.rodgers@cdhlegal.com



### Clarice Wambua

Partner | Kenya  
T +254 731 086 649  
+254 204 409 918  
+254 710 560 114  
E clarice.wambua@cdhlegal.com



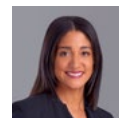
### Muhammad Gattoo

Practice Head  
Director  
Real Estate  
T +27 (0)11 562 1174  
E muhammad.gattoo@cdhlegal.com



### Roxanna Valayathum

Director  
Corporate & Commercial  
T +27 (0)11 562 1122  
E roxanna.valayathum@cdhlegal.com



### Margo-Ann Werner

Director  
Environmental Law  
T +27 (0)11 562 1560  
E margo-ann.werner@cdhlegal.com



### Nonhla Mchunu

Director  
Corporate & Commercial  
T +27 (0)11 562 1228  
E nonhla.mchunu@cdhlegal.com



### Andrew van Niekerk

Sector Head  
Director  
Power & Energy  
T +27 (0)21 481 6491  
E andrew.vanniekerk@cdhlegal.com



### Anton Ackermann

Associate  
Corporate & Commercial  
T +27 (0)11 562 1895  
E anton.ackermann@cdhlegal.com



### Phetole Modika

Director  
Finance & Banking  
T +27 (0)11 562 1625  
E phetole.modika@cdhlegal.com



### Laura Wilson

Associate  
Corporate & Commercial  
T +27 (0)11 562 1563  
E laura.wilson@cdhlegal.com



**BBBEE STATUS:** LEVEL ONE CONTRIBUTOR

Our BBBEE verification is one of several components of our transformation strategy and we continue to seek ways of improving it in a meaningful manner.

**PLEASE NOTE**

This information is published for general information purposes and is not intended to constitute legal advice. Specialist legal advice should always be sought in relation to any particular situation. Cliffe Dekker Hofmeyr will accept no responsibility for any actions taken or not taken on the basis of this publication.

**JOHANNESBURG**

1 Protea Place, Sandton, Johannesburg, 2196. Private Bag X40, Benmore, 2010, South Africa.

Dx 154 Randburg and Dx 42 Johannesburg.

T +27 (0)11 562 1000 F +27 (0)11 562 1111 E [jhb@cdhlegal.com](mailto:jhb@cdhlegal.com)

**CAPE TOWN**

11 Buitengracht Street, Cape Town, 8001. PO Box 695, Cape Town, 8000, South Africa. Dx 5 Cape Town.

T +27 (0)21 481 6300 F +27 (0)21 481 6388 E [ctn@cdhlegal.com](mailto:ctn@cdhlegal.com)

**NAIROBI**

Merchant Square, 3<sup>rd</sup> floor, Block D, Riverside Drive, Nairobi, Kenya. P.O. Box 22602-00505, Nairobi, Kenya.

T +254 731 086 649 | +254 204 409 918 | +254 710 560 114

E [cdhkenya@cdhlegal.com](mailto:cdhkenya@cdhlegal.com)

**STELLENBOSCH**

14 Louw Street, Stellenbosch Central, Stellenbosch, 7600.

T +27 (0)21 481 6400 E [cdhstellenbosch@cdhlegal.com](mailto:cdhstellenbosch@cdhlegal.com)

©2022 10857/MAR