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Energy & Infrastructure Legal Outlook 2025

January 2025

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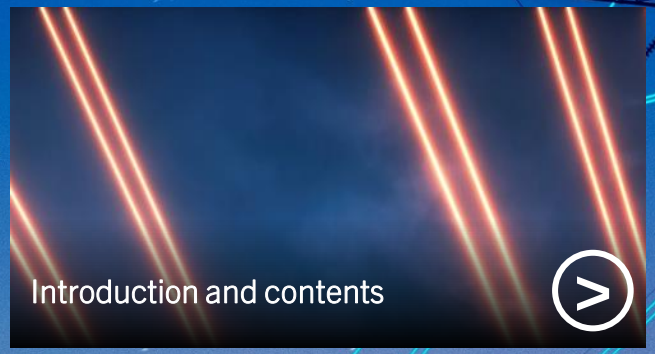

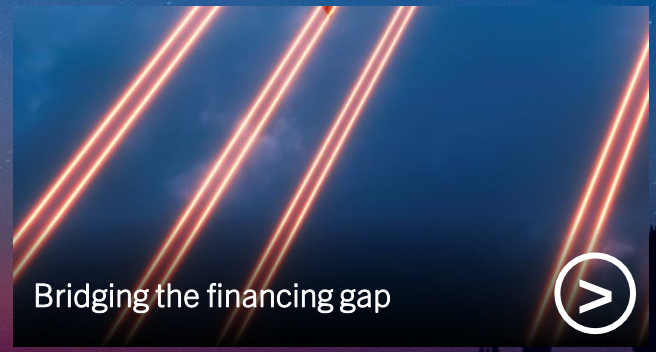

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Energy & Infrastructure Legal Outlook 2025: introduction and contents

Despite the uncertainty of the geopolitical landscape, the march on towards clean energy means there is a positive outlook for activity in the energy and infrastructure sector across the globe. Easing supply chain pressures, falling inflationary costs and progress in regulatory frameworks globally will continue to gradually increase certainty and improve economics for energy transition project developers and investors.

In this Energy & Infrastructure Legal Outlook we explore the latest developments in the UK and other key markets across the globe, highlighting the legal and regulatory changes to look out for in 2025 and beyond.

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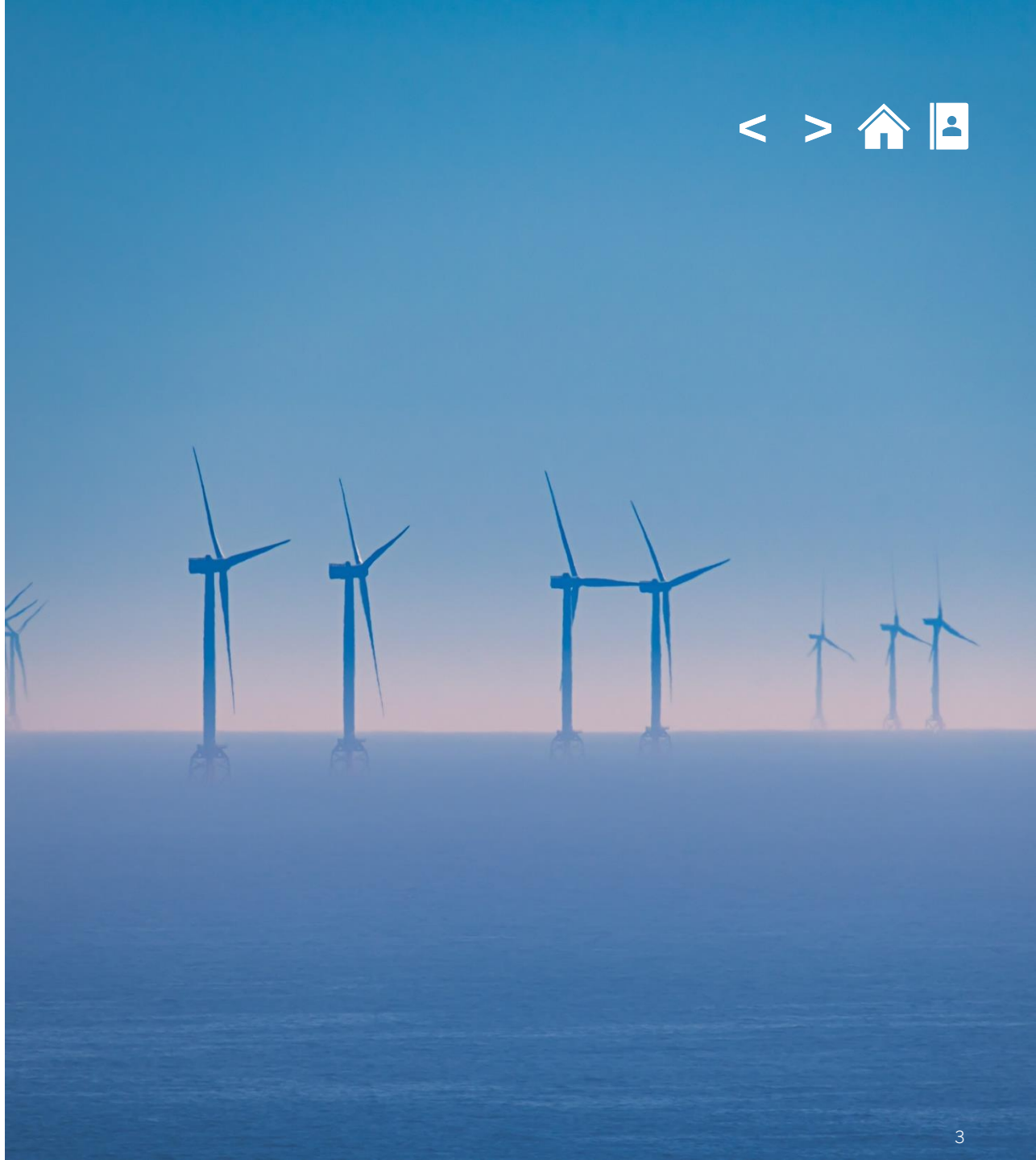
Energy & Infrastructure Legal Outlook 2025

Energy transition – a new phase



01 Meeting future clean energy demand

The energy transition is underway

The transition to clean energy is well underway and will continue. New industrial policies and climate regulation continue to advance the move towards global low carbon energy. The transition is now not only well-established - with success proven by over a decade of large-scale renewable deployment and maturing development of innovative low carbon technologies - it will continue to grow and accelerate.

Energy has become a critical factor in geopolitics, as evidenced by the energy crisis and exacerbated by the lasting effects of the pandemic. While immediate pressures in energy markets have eased, the risk of further disruption persists. 2024 was a record year for elections globally which brought with it further uncertainty about policy direction and risks associated with ongoing conflicts.

The rethinking of national energy strategies and a focus on energy security has seen the sector increasingly subject to state involvement and the introduction of new industrial policies. Governments recognise that energy demand will increase significantly in both the short and medium term due to electrification of transport and industry, the build-out of data centres and increasing global temperatures (creating further demand for cooling). For example, in the UK, the Climate Change Committee sets out that demand for electricity is expected to increase by 50% by 2035 and double by 2050.

Determining how to achieve clean energy, meet future demand, ensure energy security and facilitate economic growth is a big challenge for governments worldwide.

Meeting future energy demand

In Europe the answer is a strong drive toward renewable energy. The EU's binding renewable target for 2030 is a minimum of 42.5%, with the aspiration to reach 45% of energy sourced from renewables by 2030. In the UK, having turned off the country's last coal-fired power station in 2024, the government is committed to clean energy by 2030. The recently published Clean Power 2030 Action Plan (see section 11) has made clear that renewables will comprise the bulk of the UK's energy mix.

The incoming administration in the US has indicated it will be taking a different approach; it remains to be seen what the ambition of US "energy dominance" looks like in practice and the extent to which that position is different from current volumes of US oil production.

The global marketplace is likely to be the key driver for decisions taken by energy companies in terms of where to invest. Clients and stakeholders are demanding sustainable practices to reduce the corporate carbon footprint. Businesses also recognise that sustainable strategies contribute to longer-term efficiencies as the cost of climate change becomes more immediate and apparent.

The scale of future energy demand is likely to leave the US in a similar position to other countries: all possible forms of energy production will be required.

02 Planning the future energy mix

The future global energy mix needs to be able to meet increased energy demand in a net zero world. If renewables are to be the core of that mix, in some major jurisdictions initially at least, there also needs to be available generation from non-intermittent sources.

Taking the UK as an example, the government has set out its ambitions for:

> 43 to 50GW of offshore wind

> 27 to 29GW of onshore wind

> 45 to 47GW of solar power

by 2030, significantly reducing fossil fuel dependency.

This system will need to be complemented by both flexible capacity such as batteries, long-duration electricity storage (LDES) – which, it was announced at the end of 2024, will be supported by a cap and floor style subsidy mechanism - interconnectors and demand side response.

In addition, to ensure stability and security of supply there is an acknowledgment that firm power from nuclear and dispatchable power from biomass, gas or hydrogen plants (both abated and unabated) will inevitably form part of the 2030 power supply.

Key questions for governments globally

The key questions for all governments are:

1) what proportion do each of those energy sources represent in the future power mix, and

2) within what timescale is a cleaning-up of the energy system achievable?

In practice, higher levels of both renewable and new dispatchable generation will be needed in the longer term. Prudent governments are, therefore, likely to have an eye on ensuring the policy and market frameworks are in place for growth in both.

There are various critical enablers which need to come together to achieve clean power globally:

> transmission infrastructure build-out to suit a renewables-based energy mix

> solutions to supply chain constraints and skills shortages

> greater regulatory support for nascent technologies and markets, including improved planning

> unlocking of increased private capital

> positive engagement from the public

All of these will play a crucial role in reaching the clean power goal. Clarity for investors on the outlook for each of these elements will be vital to mobilising the vast amounts of private capital needed in time to meet the nearer-term emissions reduction goals.

What about a fossil fuel roll-back?

The timescale for a roll-back of unabated fossil fuel power is less clear on a global scale. In Europe, as renewable energy sources become more prevalent and their low dispatch costs facilitate the sale of renewable electricity more cheaply, fossil fuel power plants may become increasingly less profitable to operate.

Existing fossil fuel generators are weighing up the economics of converting to hydrogen or retrofitting carbon capture. Similarly, new fossil fuel projects in many jurisdictions must assess the viability of future dispatchable revenue streams.

The incoming US administration has a clear ambition to boost oil and gas production on federal lands and in federal waters. To achieve this, it is expected to roll back Biden-era regulations that limited available drilling lands and revise the five-year offshore drilling program to offer more acreage for production.

02 Planning the future energy mix

There is some scepticism within the industry, however, as to whether this ambition will translate into any significant change. Oil production in the US is already at an all-time high and there is a nervousness about whether demand from the sector is sustainable.

The industry is conscious of returning capital to investors and so it remains to be seen whether expansion of production is a priority.

Nonetheless, there will continue to be a need for natural gas as part of the energy mix. However, with the potential for increased LNG exports from the US and a large number of new LNG projects globally planned to come online over the next few years, there may be an oversupply of LNG notwithstanding the role it has to play while the energy system transitions.

Decarbonising fossil fuel power

Even in Europe, which is driving towards renewables as the core of the future energy mix, the need for firm power (i.e. plants which are not weather dependent) will see gas power plants continuing, with a view to their decarbonisation in the longer term.

Under the UK's Decarbonisation Readiness plans, legislation will expand the requirement to decarbonise to new build and substantially refurbishing combustion power plants. From February 2026, in scope plants will need to commit to conversion to hydrogen-firing generation or retrofit carbon capture technology within their lifetime.

Upcoming changes to the UK's capacity market are also aimed at supporting the decarbonisation of new gas power and the retrofitting of substantially refurbishing assets (see more at section 15 on capacity markets globally).

In Asia, LNG is recognised as an important transition fuel to deliver the Paris Agreement goals. The Asia Zero Emission Community lists decarbonisation of thermal power (through the use of hydrogen, ammonia and carbon capture) as one of the priorities for collaboration in the region.

With the global trend towards the continuing use of fossil fuels as a tool to smooth and facilitate the transition to clean energy, many major oil and gas companies are announcing plans to decarbonise their plants using carbon capture.

We anticipate further announcements in this vein during the course of 2025 as the industry seeks to adapt its business models to a net zero energy landscape.

03 Spotlight on offshore wind

Offshore wind in the UK

In the UK, there has been a slight slow-down in the volume of offshore wind capacity coming online in 2024. This is expected to pick up in 2025, with several large projects scheduled for construction completion.

An increased budget for the renewables contract for difference (CfD) in 2024 saw the most successful allocation round yet. For offshore wind, which neared 5GW of awarded capacity in AR6, it was a reassuring comeback from the dearth of applications tabled in AR5. Applications in AR7 will need to be significantly higher again in 2025 if the government is to achieve the huge expansion of renewables envisaged by the National Energy System Operator (NESO) as being necessary to achieve a clean power system by 2030. We have set out more details on reform of the CfD in section 10.

Offshore wind in Spain

The Spanish government approved its roadmap for the development of offshore wind and marine energy in December 2021. The aim of the roadmap is to establish Spain as a leading European hub for floating renewable energy projects, taking advantage of its extensive coastline and synergies with other strategic sectors including shipbuilding and civil engineering. The roadmap focuses on offshore wind as the priority sector, with a target of 3GW of installed capacity by 2030, but marine energy and floating solar PV farms are also contemplated in the plan.

In 2023 Spain introduced five maritime spatial plans (MSP) which identify high-potential locations for the development of offshore wind farms, based on resource availability as well as preservation of the marine environment and biodiversity.

Regulations for offshore energy production came into force in September 2024 which provide a framework for offshore energy auctions. The details of the competitive tender process will be set out in subsequent announcements. Read our client alert for more information.

Against this backdrop, developers of Spanish projects are now awaiting details of the first auction, expected to be held during 2025.

Industry stakeholders have also made clear to the Spanish government that a timetable for future developments is needed to achieve the target of 3GW of offshore wind capacity by 2030.

Offshore wind in the US

In the US, the federal government has approved half of the capacity needed to achieve the US target of 30GW offshore wind by 2030. Multiple projects are in the construction phase, with the Vineyard Wind 1 project being the first commercial US offshore wind project to supply power to the grid. It remains to be seen how the new administration will address offshore wind permitting and how it will impact the momentum of the US offshore wind industry.

It is expected that, at least in the near term, the new administration will delay approving, initiating and finalising environmental reviews for US offshore wind projects. The new administration is also expected to reassess and/or repeal the five-year schedule for offshore wind lease sales announced by the Biden administration to promote US offshore wind development.

While many agree there is likely to be some adjustment in the US offshore wind market, the bigger picture is that, with the huge increase in energy demand and the drive towards decarbonisation, an expansion of the US offshore wind market over time remains on the cards.

Offshore wind in Asia

Asia has seen sustained growth in offshore wind which is expected to continue throughout 2025 with the latest round of capacity allocations in Taiwan, Japan, Korea and the Philippines. India and Vietnam are also targeting offshore wind as part of their renewable energy mix and have announced regulatory support programmes.

03 Spotlight on offshore wind

Offshore wind in Taiwan

Taiwan reached almost 3GW of installed offshore wind capacity by November 2024 with the trend expected to continue as more fixed bottom projects allocated in the Zonal Development Round 2 reach commercial operations.

In addition to this, the Ministry of Economic Affairs has allocated approximately 2.3GW and 2.7GW of new capacity through Zonal Development Round 3 Phases 1 and 2 to be commissioned prior to 2030. An additional 3GW+ is expected to be auctioned in Round 3 Phase 3 and a further 6GW allocated in the remaining stages of Round 3, aggregating to 15GW of new capacity by 2035.

While the majority of Round 2 projects benefitted from long term offtake by the state owned Taipower under a fixed feed-in tariff, Round 3 projects awarded to date have been on a zero-tariff basis, meaning that developers must rely on corporate offtake for revenues.

A separate tender for floating offshore wind projects was delayed from 2024 and may take place during 2025. The final tender rules have not yet been announced.

Key developments to watch for in Taiwan in 2025 include:

- expansion of corporate offtake solutions and offtakers, including as a result of the government's new offtaker credit guarantee scheme and retail offtake programme.
- clarification on how the government will implement changes to localisation requirements introduced in Round 2 and strengthened in Round 3, which have impacted cost and attracted criticism from developers, following the World Trade Organisation dispute with the EU in 2024.
- the evolution of financing structures and terms to reflect the move to corporate offtake and other market dynamics, including efforts to broaden the sources of debt finance for projects.

Offshore wind in Japan

In Japan, two floating demonstration projects funded by the Green Innovation Fund were awarded in 2024 and the results of the Round 3 offshore wind auction were announced on 24 December 2024. The annual auctions (approximately 1GW in total) are expected to continue with the government noting it is still on track to achieve Japan's offshore wind ambition of 45GW by 2040. Round 4 is expected to be launched in the first half of 2025.

A new bill was submitted to the National Diet in March which would allow offshore wind projects (most of which are expected to be floating) in the Exclusive Economic Zones (EEZ). The bill was approved by the House of Representatives but is waiting for approval at the House of Councillors. Discussions on key post-award issues are ongoing, including whether to permit adjustments to the tariff due to inflation.

Offshore wind in the Philippines

The Philippines holds immense opportunity for offshore wind, with the World Bank estimating over 178GW of offshore wind potential in the country.

In December 2024, the Department of Energy announced the fifth round of the Green Energy Auction (GEA-5), exclusively dedicated to offshore wind projects. This auction, which is set to launch in Q3 of 2025, marks a significant milestone in the Philippines' journey toward offshore wind power generation by 2028.

Other government initiatives in support of the offshore wind industry include the repurposing of three strategic ports (the Port of Currimaoin Ilocos Norte, Port of Batangas in Sta. Clara, Batangas City and Port of Jose Panganiban in Camarines Norte) to ensure they are fully equipped to handle the installation, commissioning and operational requirements of offshore wind projects.

03 Spotlight on offshore wind

Whilst the market is still in its early stages (with no offshore wind project yet having reached construction phase), there are a number of advanced projects that aim to achieve first power by 2028, with one project having secured environmental compliance certification in October 2024. To expedite the development, the Philippines government has awarded a number of "green lane" certificates to leading developers. This certification is expected to assist with quicker permitting and licensing processes as well as resolving strategic investment issues.

With GEA-5 and other green energy initiatives, the Department of Energy has reaffirmed its dedication to positioning the Philippines as a global contributor to the green energy transition, with offshore wind as its focus.

The challenges for offshore wind

The growth of global offshore wind at the rate needed for renewables to become the core generator of electricity still faces several challenges. The green hydrogen production industry, which is a huge future consumer of renewable power, has had a slow start and state support for hydrogen projects is still in the nascent stages (see more on hydrogen in section 04).

Supply chain constraints also remain challenging. Although inflationary pressures have eased, the balance still lies in favour of suppliers, with developers competing for capacity and timely delivery. Developers around the world are also racing to secure the specialist skills needed to bring these projects to fruition given how many countries have ambitious wind generation targets. Engineering and project development skills will need to be transferred in from other sectors, such as oil and gas and the armed forces, if such targets are to be achieved.

For UK generators, the lower electricity price has also been a challenge. Significant uncertainty prevails in this area as reform of the energy market is set to change the basis of electricity pricing, potentially substantially (read more on this in section 09).

Outlook for offshore wind

Subject to successful grid build-out (see section 08) and an increase in storage capacity to ensure the flexibility and resilience of a renewables-based energy system, the outlook for offshore wind looks hugely positive. There is a greater mix of funding sources available for offshore wind projects (see page 29) and, with corporate shareholders providing pressure towards decarbonisation, corporate power purchase agreements (CPPAs) are increasingly being relied upon as a key, stable revenue source.

Floating offshore wind

Floating offshore wind will have an increasingly important role to play in the energy transition, particularly in jurisdictions such as Portugal where there is a shallower sea depth than is needed to install fixed bottom turbines.

The primary challenge for floating offshore wind is that existing large turbine manufacturers have, to date, shown relatively little interest. Success and scale for the floating offshore wind sector will likely depend on new manufacturers entering the market.

04 Spotlight on hydrogen

Low carbon hydrogen has long been touted as being key to the achievement of net zero by 2050. It is seen as particularly valuable for "deep decarbonisation" in hard-to-abate sectors such as steel, fertilisers, refinery processes, maritime and aviation. The industry holds further potential for decarbonising electricity production in markets with few alternatives, contributing to energy storage and system resilience and unlocking renewable potential in remote locations.

Signs of confidence

Despite the huge potential, the pace of deployment of hydrogen projects globally has been slower than initially anticipated due to evolving policy and regulatory frameworks, high capital costs and high-profile cancellations of some first-mover projects.

While current global hydrogen demand is principally covered by production from unabated fossil fuels, International Energy Agency analysis indicates that capacity for low carbon hydrogen production (whether electrolysis or fossil fuels with carbon capture) will increase at least fivefold by 2030. This anticipated increase is a response to efforts by governments globally to stimulate demand for low-emissions hydrogen.

While the number of countries with a hydrogen strategy in place is growing, there continue to be policy and regulatory gaps that act as a brake on project development. We anticipate an increase in the pace of transfer of supportive policy into legislation over the coming years to address these gaps.

Hydrogen market stakeholders will also be watching continuing developments in regulation addressing the environmental attributes of low carbon hydrogen throughout 2025 and beyond.

Progress on the alignment of low carbon hydrogen certification schemes, as well as clarification of requirements under national legislation, will be key to cultivating certainty for investors and project developers.

Certification which confirms whether a product complies with certain criteria which evidence its contribution to emissions reduction, along with consistency about what those criteria are, will also be crucial for successful cross-border hydrogen trading.

It is hoped that certification schemes already in place or proposed, and their underlying rules, will see greater alignment globally so as to reduce administrative burden and complexity.

Support for hydrogen in the UK

The UK is a good example of where confidence in the future market for low carbon hydrogen is growing. Over £2bn in revenue support for 11 commercial scale green hydrogen production projects totalling 125MW was announced in December 2023, with several of these projects having finally signed the related support instruments in December 2024.

The combination of the government's hydrogen production business model providing revenue certainty through the Low Carbon Hydrogen Agreement and the physical location of the projects in the UK's industrial hubs helps alleviate two of the key risks for hydrogen production projects: a reliable offtake market and the cross-chain risk of access to enabling infrastructure.

At the end of 2024, the need for market intervention for hydrogen to power (H2P) (the conversion of low carbon hydrogen to produce low carbon electricity) was confirmed by the UK government announcing an H2P business model based on a dispatchable power agreement-type mechanism.

The increased investment risk and uncertainty which results from H2P being a first-of-a-kind technology, along with the current underdevelopment of critical enabling infrastructure (i.e. pipelines and storage) are the key barriers the business model is seeking to overcome.

04 Spotlight on hydrogen

Clear and viable routes to market are also recognised as crucial to maximising the potential of H2P. To this end the government has committed to enabling participation of H2P in the capacity market “as soon as practical".

A market engagement document will be published in Spring 2025 outlining further detail on the proposed design of the H2P business model, including how it might interact with Great British Energy investment opportunities (see section 12 for more on Great British Energy).

Japan CfD subsidy

Market observers will also be keenly focused on Japan, where a JPY 3trn (approximately US$20bn) low carbon fuel contract for difference (Japan CfD Subsidy) programme launched in November 2024.

The Japan CfD Subsidy, funded by the Japanese Government’s GX economy transition bond programme, will be provided for 15 years from the start of commercial operations and sized based on the price gap between a strike price and a reference price.

The scheme covers domestic supply of low carbon hydrogen, ammonia, e-methane and synthetic fuel projects as well as cross-border projects exporting low carbon fuels to Japan.

The application window closes in March 2025. See our client alert for more information on Japan’s subsidy support for low carbon fuels.

Blue hydrogen in the US

In the US, despite persistent challenges from cost pressures, difficulty securing offtake agreements and navigating complex regulatory environments, there are signals that the blue hydrogen sector will surge in 2025 with at least three large-scale projects expected to reach a final investment decision.

The new administration is expected to bring continued optimism for the US hydrogen industry given the opportunities for the hydrocarbon industry to participate in this market and recent relaxation of rules on tax credits for hydrogen producers.

05 Spotlight on nuclear

Meeting baseload power demand

Nuclear energy is seeing a resurgence around the globe. As the enormity of future energy demand becomes clear, there is a recognition that nuclear will need to form a key part of many economies' baseload power. The International Atomic Energy Agency sets out that investments in nuclear energy currently stand at around US$50bn annually; this figure needs to increase to at least US$125bn per year to meet predicated capacity goals.

In the US, annual investment in data centre construction has doubled in the past two years alone. To meet data centres' large energy demands, tech companies have started to rely on nuclear energy to balance out the intermittency of renewable energy sources and help meet their carbon neutrality goals. The US Congress recently passed a bipartisan law (the ADVANCE Act) that streamlines the permitting process and incentivises developments of new-wave nuclear projects, like small modular reactors, which may be used to support data centres.

Financing large nuclear projects has historically been challenging due to high capital costs, long construction timelines, concerns around environmental issues and the challenges of public perception as well as a lack of consistency from policy makers.

A turning point for nuclear financing

There are several moving parts now converging which have the potential to transform nuclear financing:

- the urgency of achieving net zero goals and a renewed focus on energy security is leading to greater government support for nuclear as a low carbon energy source. The German government, for example, is reconsidering its position in relation to nuclear energy to which it has historically been opposed. In Japan, the government has proposed that nuclear power is raised to approximately 20% of the electricity supply in 2040.
- innovative, collaborative investment models are developing to distribute risk between the public and private sectors.
- pseudo-state entities in the form of export credit agencies and multilateral institutions are also getting on-board.
- the development of advanced modular reactors and small modular reactors are providing an alternative, lower risk investment opportunity into the nuclear sector.

Read more on the future of nuclear financing in our client alert.

06 Spotlight on CCUS and carbon markets

Carbon capture utilisation and storage (CCUS) is now becoming established as a core technology in the energy transition, reducing emissions from hard-to-abate industrial processes and directly removing greenhouse gases from the atmosphere. Many economies are also aiming to realise the potential the CCUS sector has for creating low carbon jobs and new business opportunities.

The UK CCUS sector is one of the most advanced. Financial close was announced on the debt financing for the Net Zero Teesside Power (NZT Power) and Northern Endurance Partnership (NEP) projects, which are the first carbon capture and storage projects in the UK and on which Linklaters advised.

The NEP carbon capture and NZT Power projects are part of the East Coast Cluster, one of two Track 1 industrial CCUS clusters selected by the UK government to advance carbon capture initiatives as part of its net zero emissions strategy. The two Track 1 clusters will be operational in the mid 2020s.

Two further clusters will be established through the Track 2 process, with the government's selection of the anchor projects anticipated in Spring 2025, along with a shortlist for the expansion of Track 1.

Cross-border CO2 transfer

The market for cross-border CO2 transport and sequestration continues to evolve. With some precedent for cross-border deals within the EEA (such as Yara International's deal with the Northern Lights project in Norway), it remains to be seen whether cross-border CO2 transportation for storage can be enabled between the UK and Europe.

While some technical barriers, such as the bilateral country arrangements needed to circumvent the prohibition on cross-border CO2 transfer under the London Protocol can be overcome, broader agreement between the UK and EU on equivalence of carbon capture arrangements to allow mutual recognition for the purposes of the UK and EU emissions trading schemes (ETS) is proving harder to negotiate.

The CCUS industry will be following developments on these issues closely during the coming year, not least because they will set an important precedent for cross-border CCUS projects in other regions. Asia, in particular, will be taking note as there are multiple cross-border CCUS projects planned in Malaysia, Indonesia and Australia.

Carbon border adjustment mechanisms

The UK has confirmed it will introduce a carbon border adjustment mechanism (CBAM) from 1 January 2027. A CBAM is intended to address carbon leakage which is the movement of production and associated emissions from one country to another due to different levels of carbon pricing and climate regulation.

The aim of a CBAM is to level the playing field between domestic industries which are accountable in their own jurisdiction for the carbon they produce and those abroad which provide goods into domestic markets but are not subject to domestic carbon pricing.

Under the UK CBAM, highly traded carbon intensive goods in the aluminium, cement, fertiliser, hydrogen, iron and steel sectors imported into the UK will be made subject to a carbon price that is comparable to what would have been payable had such goods been produced in the UK. Glass and ceramics production will not be included on the basis that they are less emissions-intensive than the covered sectors and, therefore, relatively less exposed to carbon leakage risk. Aligning the UK CBAM with the EU CBAM will be key to ensure that domestic industries are not prejudiced in either case.

06 Spotlight on CCUS and carbon markets

Carbon markets and emissions trading schemes

The way governments around the world approach regulating carbon emissions in their jurisdiction will depend both on their view of climate change as a human-caused phenomenon and their acceptance of greenhouse gas emissions as an externality that needs to be priced into goods and services.

We have seen in recent years a general convergence towards cap and trade schemes as a method for introducing carbon pricing at both a national and an international level. Tax schemes are also prevalent, sometimes paired with a cap and trade solution.

The variance in measures introduced is significant (sector coverage, trading schemes vs tax measures, levels of ambition, absolute vs efficiency-based caps) meaning that no single universal price has or is likely to emerge in the short to medium term.

Robust, liquid, long term and transparent carbon markets are, however, likely to be the key driver to the success of CCUS as an industry and ultimately to global decarbonisation, so it is important to track the emergence of these carbon pricing regimes.

The aim of compliance-based cap and trade schemes and carbon taxes is to create a price signal for cutting carbon emissions and, therefore, an incentive for emitting less, in economic terms, internalising the externality that is the emission of greenhouse gases into the atmosphere.

This creates an economic case for shifting capital towards lower carbon technologies and away from high-emission activities.

That economic incentive can take various forms including:

- a revenue stream derived from selling tradable carbon credits issued in connection with a carbon reduction or removal activity (a Project Mechanism).
- a cost avoidance benefit from not having to purchase carbon credits to meet a compliance obligation in respect of the captured greenhouse gas where the activity is subject to an emissions cap set under a cap and trade scheme.
- for tax schemes, reducing the tax burden through a corresponding reduction in greenhouse gas emitting activities.

Certain activities, such as bioenergy carbon capture and storage may, where regulated under a cap and trade scheme, have a double benefit from both avoiding the obligation to comply under the scheme (as no emissions are deemed to have occurred) whilst also achieving carbon removals through the biological capture of CO2 in the plant material which is then permanently stored.

The removals can be credited under a Project Mechanism, such as that promulgated by Puro Earth, and then sold into the market.

UK ETS

In respect of the UK ETS compliance scheme, the price participants pay for allowances has been relatively low in recent times in comparison to that under the EU ETS. This is primarily because of the relative lack of liquidity associated with a lack of 'offsetting' demand now that EU emitters can no longer buy UK issued allowances for their own domestic compliance.

The lack of compensatory demand pools that absorb the excess emissions resulting from comparatively quicker UK decarbonisation has resulted in a lower carbon price in the UK system.

The UK government is looking to reform and expand the scope of the UK ETS over the coming years including adding sectors such as energy from waste and waste incineration as well as domestic maritime emissions and CO2 venting by upstream oil and gas installations.

It is hoped that this will increase liquidity generally in the system and support a higher carbon price.

06 Spotlight on CCUS and carbon markets

Voluntary carbon markets

Demand for verified ('voluntary market') carbon credits generated by Project Mechanisms is currently almost exclusively philanthropic in nature and depends on corporates' continued willingness to create a market by investing in the activities which generate these credits or by purchasing them from secondary sources.

For this market, including CCUS projects, to continue and scale it is critical to provide a long term and predicable demand signal; further, there needs to be a clear benefit either reputationally or financially for corporates to participate. Alternatively, some form of regulatory intervention to maximise potential market demand is required through the creation of regulatory obligations to offset emissions.

Progress towards an international carbon market between government actors was made at the 2024 COP in Baku at which standards for assessing projects involving greenhouse gas removals were adopted for the purpose of creating the new UN carbon market, known as the Paris Agreement Crediting Mechanism.

These standards will help project developers create and submit methodologies for their projects, to allow them to be registered under the new mechanism. The carbon credits generated by these projects can be traded privately to create liquidity and ultimately sold to governments as the end users.

It is hoped that the new UN mechanisms will unlock new funding of opportunities for projects as countries work to achieve emission reduction targets. Indeed, it is hoped that these new pockets of demand will stimulate funding for carbon removal activities.

The CCUS industry will be watching these developments closely to align around creating projects that are able to deliver into these new pockets of demand.

07 Steady progress on SAF

Aviation continues to be a major source of global hard-to-abate CO2 emissions. The aviation industry and governments globally are, however, making progress on increasing the amount of sustainable aviation fuel (SAF) in the overall aviation fuel mix.

Such progress is a response to both increasing discretionary uptake and the implementation of a number of mandated SAF targets. Given the huge CO2 emissions of the aviation industry, maximising the potential carbon savings that SAF offers will be crucial to global net zero goals.

The UK's Sustainable Aviation Fuel (SAF) Mandate, which came into force on 1 January 2025, requires suppliers of aviation fuel to ensure that SAF makes up an increasing proportion of jet fuel supplied to the UK each year. The mandate begins at 2% of total UK jet fuel demand and increases to 10% in 2030 and 22% in 2040.

To support the development of newer SAF production pathways, the mandate also provides that:

- HEFA can contribute a maximum amount (100%) of SAF demand in 2025 and 2026, decreasing to 71% in 2030 and 35% in 2040.
- from 2028, 0.2% of total jet fuel demand will need to be satisfied from power-to-liquid pathways (rising to 3.5% of total jet fuel demand in 2040).

The UK government has also announced its intention to implement a revenue certainty mechanism in order to further support deployment of new SAF production capacity in the UK. A number of options for the mechanism were outlined in a 2024 consultation document.

A further consultation is expected to be launched early in 2025, potentially providing important clarity to investors on the government's preferred approach to this issue.

The EU has similar targets as part of its Fit for 55 package, with requirements for 2% of fuel at EU airports to be SAF by 2025 (rising to 6% by 2030, 20% by 2035 and gradually to 70% by 2050, of which a proportion – 50% by 2050 – must be sourced from synthetic sources).

Binding targets such as these, coupled with CORSIA and other voluntary CO2 reduction mechanisms, will help to provide long-term demand support to the SAF industry and, it is hoped, push forward the investment needed to increase the development and production capacity of SAF at scale.

Even with a number of sources of potential grant funding and other forms of support available (such as the financial support afforded by the EU-ETS SAF allowance mechanism, and the permitting and administrative support contemplated by the EU's Net Zero Industry Act), there remain cost-competitiveness and systemic challenges that are constraining the deployment of new SAF projects.

In the near-term the limited availability of sustainable feedstock to support production of first and second generation SAF is a particular challenge for the industry.

Further policy and regulatory intervention can, therefore, be anticipated in the coming years to support the market as it matures and help unlock the financing needed to enable the industry to grow.

08 Building out the grid

The scale and pace of development of electricity transmission networks needs to increase significantly to enable a timely transition to low carbon energy systems and to support increasing load demand.

Globally, existing grids were designed to transport coal and gas-fired generation to relatively limited areas of high industrial and urbanised demand. Renewable generation is often located far from the demand it needs to serve; getting ever-increasing volumes of offshore-generated electricity to homes and businesses requires new transmission lines and infrastructure both on- and offshore.

With electricity demand forecast to increase exponentially over the coming years, current grids are unlikely to be able to handle such demand. In the US alone, electricity demand is forecasted to increase 15.8% by 2029.

Coordination and planning

The UK electricity transmission network needs roughly five times more funding in the next six years than has been invested in the last 30 years. A Centralised Strategic Network Plan being worked on by the energy regulator (Ofgem), NESO and the UK's transmission operators is due in 2027. It is hoped the plan will improve the coordination of investment into the grid.

In the meantime, various interim plans to reinforce the existing network are being implemented.

Developers and investors in new energy generation must navigate the uncertainty about whether the grid build-out will materialise in the timeframes and locations needed for their projects to successfully connect and generate revenue.

Our Real Estate Outlook 2025 contains information about UK planning reform which is acknowledged as a key enabler of successful grid development.

In the US, there have been significant grid expansion policies and developments, including the Federal Energy Regulatory Commission's Order 2023 on generator interconnection and Order 1920 on transmission planning and cost allocation and the Department of Energy's National Transmission Needs Study and National Transmission Planning Study.

Challenges remain, however, including long permitting times (up to ten years for new transmission projects), planning uncertainty, local opposition, siting issues and supply chain disruptions.

Supply chain constraints

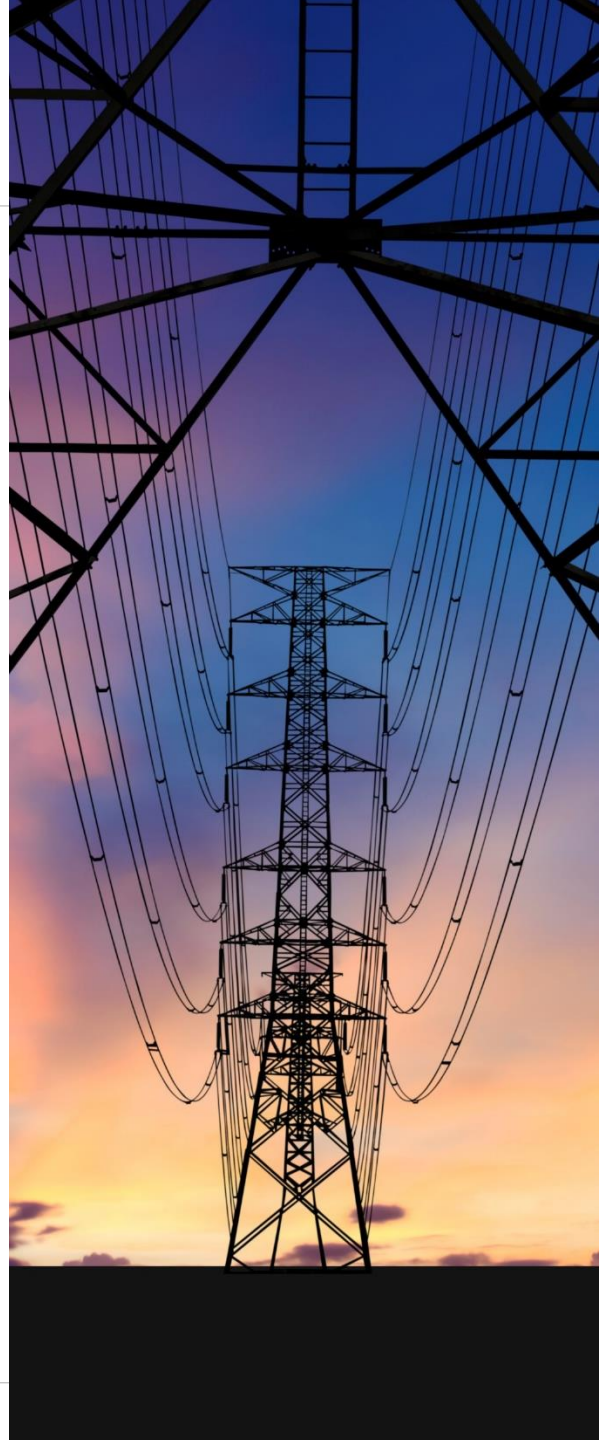
Constraints to the supply of some equipment and services critical for network expansion are also an ever-present challenge to grid build-out.

In the UK, one of the tools Ofgem is considering to ensure the grid is fit for clean energy by 2030 is a new advanced procurement mechanism (APM) worth between £5bn and £8bn.

The APM, which could be introduced in early 2025, would provide transmission owners with a use-it-or-lose-it allowance to secure capacity for equipment procurement (of assets which can be transferred between different projects or for which the detailed specifications can be set out at a later date) years in advance of when it is needed.

The intention of the APM is to fund spending that would otherwise happen later in the project life cycle; by bringing such spending forward the hope is to mitigate potential supply chain delays. The APM would be implemented via a modification to the RIIO-ET2 licences.

Ofgem is also considering a model similar to the APM to facilitate additional offshore network connections for offshore transmission owners and interconnectors.



08 Building out the grid

Patterns of energy consumption

In Spain, government policies focused on the decarbonisation and digitalisation of the economy have changed patterns of energy consumption.

There has been a significant rise in applications for grid access to particular supply points with large demand, such as from EV charging stations, hydrogen producers, battery facilities, port electrification and data centres.

To prevent speculators from monopolising permits and to ringfence storage systems, in September 2024 Spain's markets and competition authority (CNMC) announced the method and conditions for granting Spanish grid access and connections to facilities with electricity demand (Circular 1/2024, de 27 de Septiembre).

The new CNMC procedures award permits through an auction process where there is competition for access at a particular node on the transmission network.

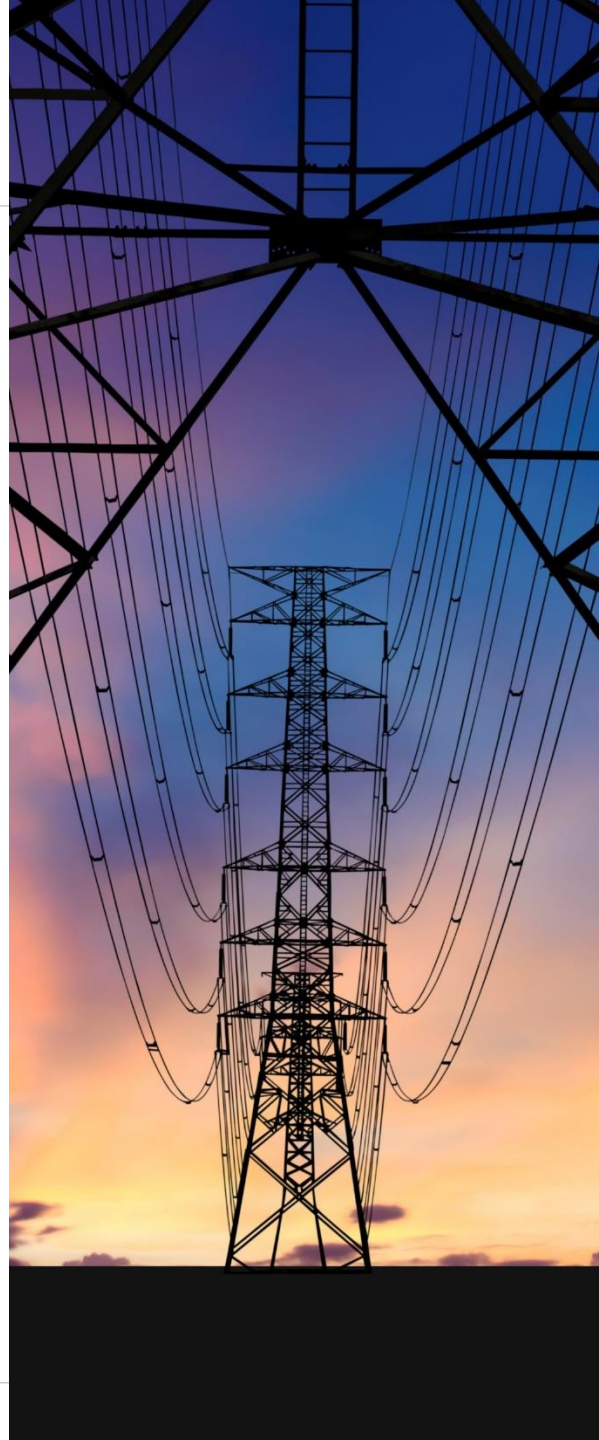
New demand-based terms have also been introduced which prioritise access and connection for storage facilities with a view to increasing the flexibility of the overall system.

The new procedure, which the sector has long been calling for, came into effect on 11 January 2025. Its full application, including the grant of flexible permits, depends, however, on the introduction of detailed regulations which are expected during 2025.

Protecting the power grid

At the end of 2024, the US Department of Energy announced nearly US$2bn for 38 projects that were identified to protect the US power grid against growing threats of extreme weather and to increase grid capacity to meet load growth arising from increased manufacturing, data centres and electrification.

It is unclear whether the new US administration will continue to address the grid expansion issues and whether it will support the selected projects.



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Energy & Infrastructure Legal Outlook 2025

Changing regulatory landscape

09 Electricity market and network arrangements

As the 2030 and 2050 targets near, the pace of regulatory reform is likely to increase. Many governments are introducing extensive legislation affecting the design of the gas and electricity markets and to establish the framework for the scale-up of low carbon generating technology.

This changing regulatory landscape, and temporary uncertainty, will continue into 2025. All major countries will produce revised Nationally Determined Contributions by February 2025 pursuant to the Paris Agreement, which is expected to trigger further new policies and incentive measures globally.

In some jurisdictions, electoral changes are also contributing to policy uncertainty. Following the dissolution of the three-party coalition, for example, Germany is scheduled to have early general elections in February 2025, delaying several critical decisions. Numerous legislative projects pertinent to the energy sector will not be completed, such as the plans for tenders for hydrogen-ready gas-fired power plants and the design of an electricity capacity mechanism.

The election results may influence the future role of fossil fuels, including natural gas, in Germany's energy strategy. Irrespective of the outcome of the elections, the need for investment in German energy infrastructure, as elsewhere, continues to be vast both in respect of electricity networks and generation and hydrogen production and networks.

Network reform in Germany

Unaffected by the elections, the German Federal Network Agency (BNetzA) has taken first steps to reform the system of network access and network fees to comply with a judgment of the European Court of Justice of 2021 which found that the current German system left too little decision-making power for the BNetzA.

The authority has already implemented some changes to the network fee regime and has presented its strategy for the remuneration of operators of gas and electricity distribution networks and of gas transmission networks. Plans for electricity transmission operators are expected to be published in 2025.

REMA

In the UK, industry is still awaiting the outcome of the government's Review of Electricity Market Arrangements (REMA).

Energy generators, investors, financiers, suppliers and consumers will be affected by the decision about whether future electricity pricing will be governed by a reformed version of the current national marginal pricing mechanism or move to a location-focused zonal pricing method.

Reform of the electricity markets through the REMA process is intended to ensure that the power markets are fit for purpose for driving decarbonisation, subject to security of energy supply.

Reform is needed because there is a growing mismatch between how the UK electricity markets are structured and how renewable and other low carbon long-duration energy technologies operate.

With the publication of REMA 2 in March 2024, the government narrowed down its proposals, discounting many of the more fundamental changes originally proposed.

It is hoped the move away from the more radical market reform changes will temper investment uncertainty and help the UK attract the private capital needed to develop and scale-up low carbon, flexible technologies.

There remain strong views in industry in favour of both pricing options still under consideration. Whichever option is decided upon, it will represent great change for the industry and for so long as the decision remains outstanding, the uncertainty will play into the risk analysis that developers and financiers undertake for any given project or acquisition.

We understand that a final decision on pricing will be made in the middle of 2025 at the earliest.

10 UK CfD reform

The UK government is focused on the delivery of the renewable deployment needed to meet the 2030 clean power target (see section 11 for more on the Clean Power 2030 Action Plan). The renewable CfD scheme is a key tool to achieving this aim.

Aside from increasing the budget for renewables in the CfD auctions, the scheme continues to undergo reform to adjust to the changing energy environment.

It is evolving to extend to floating offshore wind and repowered onshore wind projects. Consideration is also being given to how it could better support projects that connect into multi-purpose interconnectors.

The Clean Power 2030 Action Plan confirms there will be further consultation on CfD reforms in early 2025 to consider how to enable the delivery of renewables at sufficient scale to meet the 2030 clean power target. These include:

- changes to the information used to determine the final budget for fixed bottom offshore wind
- putting in place an auction schedule to ensure greater transparency and predictability of the auction process
- reviewing the auction parameters, including the approach to the reference price
- relaxing eligibility criteria for offshore wind where projects have yet to obtain full planning consent (which, whilst welcomed by some in the industry, is met by others with unease due to the potential for opening the floodgates to speculative applications)
- changes to CfD contract terms that would give longer market certainty once contracts are awarded, including consideration of the merits of increasing the current 15-year CfD term

Non-price factors

A further potential evolution of the UK CfD scheme and other similar state support for low carbon technology globally is the incorporation of non-price factors (NPFs) in assessment of the project for subsidy support.

NPFs incentivise projects and developers to deliver broader value to society and the environment across the wider supply chain, rather than simply rewarding the lowest cost projects.

While the introduction of complexity is a key consideration, this potential change reflects the broader environmental, social and governance movement of which governments and corporations alike are increasingly conscious.

11 UK Clean Power 2030 Action Plan

The UK government's December 2024 Clean Power 2030 Action Plan is slated to "usher in a new era of clean electricity". The ambitious goal is for the 2030 power system, in a typical weather year, to "see clean sources produce at least as much power as Great Britain consumes in total over the whole year, and at least 95% of Great Britain's generation".

Clean Power 2030 (CP30) is intended to be a signal to investors to locate in the UK and build strong domestic supply chains for key aspects of the clean power economy.

Following the advice of NESO, the UK's pathway to clean power contemplates an energy mix made up of:

- variable power from wind and solar
- firm power from nuclear
- dispatchable power from biomass, gas with carbon capture, hydrogen and unabated gas
- flexibility from LDES, batteries, interconnectors and demand side response

Gas power will be retained at levels similar to today to ensure security of supply.

The plan requires a significant increase in flexibility (requiring community and consumer engagement) and renewable capacity plus an increase in firm nuclear power. New legislation and policy changes will be required to implement the plan over the coming years.

Next steps on CP30

Immediate key actions the government is proposing to take to implement CP30 include:

- speeding up the reform of the electricity network and connections process
- an upgrade of the planning and consenting regime
- removing blockages to renewable and nuclear project delivery
- reform of the electricity markets
- publishing a roadmap for short-duration energy storage and flexibility
- providing support (in the form of a cap and floor scheme) for long-duration flexible assets
- creating a sector plan to shore up the clean energy supply chain and workforce

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12 Great British Energy, National Wealth Fund and The Crown Estate

The creation of a new state-owned, operationally independent energy company, Great British Energy (GBE), is one of the UK government's key tools to achieving its vision for the 2030 power system.

The Great British Energy Bill 2024, which will place GBE on a statutory footing, is making its way through Parliament. The Bill is not expected to change fundamentally as part of the legislative process but in the House of Lords, proposed amendments have been put forward to require government to consult before a statement of strategic priorities is published and to include requirements for GBE to report on the projected impact of its investments on wholesale electricity prices over the following ten years.

The role of GBE in the energy market

GBE's mission is to "responsibly accelerate the energy transition" through project development, ownership and investment as well as to support domestic clean energy supply chains and community energy projects.

While there has been some uncertainty as to what role GBE will play in the UK energy market, it is likely that, in addition to supporting community energy projects, it will support innovative technology such as floating offshore wind and facilitate the expansion at pace of more established low carbon technologies. In relation to the latter, the Clean Power 2030 Action Plan confirms GBE will be a tool to accelerate the delivery of onshore and offshore clean energy projects by leading or co-leading (alongside public and private sector partners) projects through the pre-development phase and, in some cases, construction and operation.

GBE is also expecting to be able to add significant value by offering technical expertise; it is actively recruiting, with some key senior appointments having already been made by the end of 2024.

Support from GBE will come specifically through equity, loans, grants, insurance and guarantees with its initial investment activities being run by the National Wealth Fund (NWF, formerly the UK Infrastructure Bank) (see below for more on NWF).

GBE and The Crown Estate

A partnership now in place between GBE and The Crown Estate is anticipated to leverage up to £60bn of private investment into the UK's drive for energy independence. The Crown Estate estimates this partnership will lead to up to 20 to 30GW of new offshore wind development reaching seabed lease stage by 2030.

The Crown Estate itself is also evolving in a manner to further support the clean energy transition with the Crown Estate Bill 2024 making its way through Parliament.

The Bill seeks to modernise The Crown Estate by removing outdated restrictions on its activities so it can, for example, invest in digital technologies to assist spatial mapping of the seabed. It also seeks to expand The Crown Estate's investment powers and grant it borrowing capabilities.

As GBE establishes, further working partnerships with industry and unions, as well as communities and other public sector organisations will be formed.

We are expecting GBE to publish its statement of strategic priorities during 2025 which will likely set out further detail as to where it sees opportunities to make the most meaningful impact in the clean energy transition in the UK.

National Wealth Fund

NWF, initially capitalised with £27.8bn, has a slightly broader remit and enhanced risk budget in comparison to the former UK Infrastructure Bank. Green steel, ports, gigafactories, green hydrogen and CCUS will remain core sectors and have a ringfenced funding pool of £5.8bn.

The aim is for NWF to facilitate private sector investment by taking on elements of delivery risk, operational/performance risk and policy risk that the private sector cannot.

Its products remain the same and include senior debt, guarantees for senior debt, credit enhancement guarantees (to address cost overruns or dips in asset performance, for example) and direct equity.

13 UK connections reform

A change in the landscape for investors and developers

Existing processes for connecting to the electricity grid are designed for a time when the demand for electricity was much lower, less complex and without a view to decarbonisation. As a result, in the UK, project developers are waiting too long to connect to the network. There are also projects in the queue that are holding capacity and then not progressing.

Connections reform is needed, therefore, to make the connections process more agile, simpler to understand and ultimately aligned with the transition to clean power.

NESO's proposed package of connections reforms, submitted to Ofgem in December 2024 for approval in Q1 2025, will redefine how the connections queue is established and managed. Connection to the grid will move from a "first-come, first-served" model to one which considers both "project readiness" and "strategic alignment" with the path to clean power.

The proposed reforms will include rights for NESO to terminate projects with grid connection contracts if they are not progressing against agreed project milestones.

NESO will also have the ability to re-jig the connections queue to prioritise connection for projects which are aligned with the government's plan to get the right type of energy generation in the right location.

Additional financial commitment

To prevent speculative applications into the connections process, NESO is also proposing to require an additional financial commitment from connections applicants.

In an initial Call for Input on the proposals, NESO recognises the additional financial commitment would "change the landscape for investors and developers".

The proposal has generated much discussion in the industry given it is a potentially significant cost for developers. Known as the capacity commitment fee and sized at a rate of £20,000 per MW, it would exist in tandem with the current cancellation charges regime which seeks to cover NESO's wasted costs in the event a connection agreement is terminated.

Strategic Spatial Energy Plan

NESO has been separately commissioned to create a Strategic Spatial Energy Plan for Great Britain which will determine the location for new energy infrastructure, focusing on generation and storage of electricity, including hydrogen assets, to facilitate the clean energy transition.

Developers and investors will be keenly awaiting the first iteration of the plan due by 2026.

14 US federal environmental reviews and permitting

Federal environmental reviews and permitting for all US energy projects will be in focus as a result of the change of federal administration on 20 January 2025.

Implementation of the National Environmental Policy Act

All three branches of the US government have been and will continue to be focused on the scope and implementation of the National Environmental Policy Act (NEPA), which governs federal environmental reviews and permitting, and its impact on energy projects, infrastructure and regulatory rules.

The DC Circuit recently held that the White House Council on Environmental Quality (CEQ) – an entity within the Executive Office of the President that has overseen NEPA policy and implementation for over five decades – has no statutory authority under NEPA to promulgate binding regulations.

Undoubtedly, the decision will create significant uncertainty about the scope of federal agencies' NEPA obligations as they assess the environmental impacts of proposed "major Federal actions" (as used in NEPA), such as those for infrastructure projects, onshore and offshore oil and gas, offshore wind and onshore solar and wind.

For at least the near term, the decision will likely further slow the permitting process down and increase litigation risk.

It remains to be seen how the federal agencies that rely on the CEQ's NEPA regulations will react, whether the decision will be appealed and how the decision will be implemented by the incoming administration.

Seven County Infrastructure Coalition v Eagle County

The US Supreme Court is expected to issue a ruling in *Seven County Infrastructure Coalition v Eagle County*, which asks the justices to limit federal environmental reviews to environmental impacts close to a project itself and restrict agencies' ability to analyse the broader climate effects of projects.

This case challenges an environmental review decision that was issued by the US Supreme Court in 2017. In making their ruling, the justices may address CEQ's rulemaking authority that was called into question by the DC Circuit.

Outlook for permitting

Congress continues to introduce laws that streamline permitting and environmental review requirements for all types of energy projects.

To date, no such reforms have been passed and enacted. In general, the parties have failed to agree on the scope of permitting and environmental review reforms that are necessary. It is likely that such legislative efforts will continue in 2025.

President-elect Trump has identified permitting as a priority of his administration. In social media posts, he has promised to expedite federal permits for energy projects and other construction worth more than US$1bn.

15 Capacity markets

The primary role of capacity markets is to enhance the reliability of the energy system by compensating generators to be available to supply power when needed to meet peak demand. They have been introduced in varying forms around the globe, often in the wake of specific concerns about security of supply.

Where they exist, capacity markets are undergoing reform to respond to the changing energy system. They will become a revenue stream of particular importance for dispatchable power plants in a future renewables-based energy system.

The UK has had a successful capacity market since 2014. Changes are currently being considered, for introduction in early 2025, which support the economic case for investment to decarbonise ageing unabated gas plants and ensure that all participating substantially refurbishing or new combustion power plants have a credible plan in place to decarbonise (through conversion either to hydrogen to power or power CCUS).

In Japan, a capacity market has existed since 2020 with a long-term decarbonisation power source capacity auction beginning from 2023. In 2024, 20-year capacity contracts were awardees to 4GW of clean energy and 5.7GW of gas-fired projects.

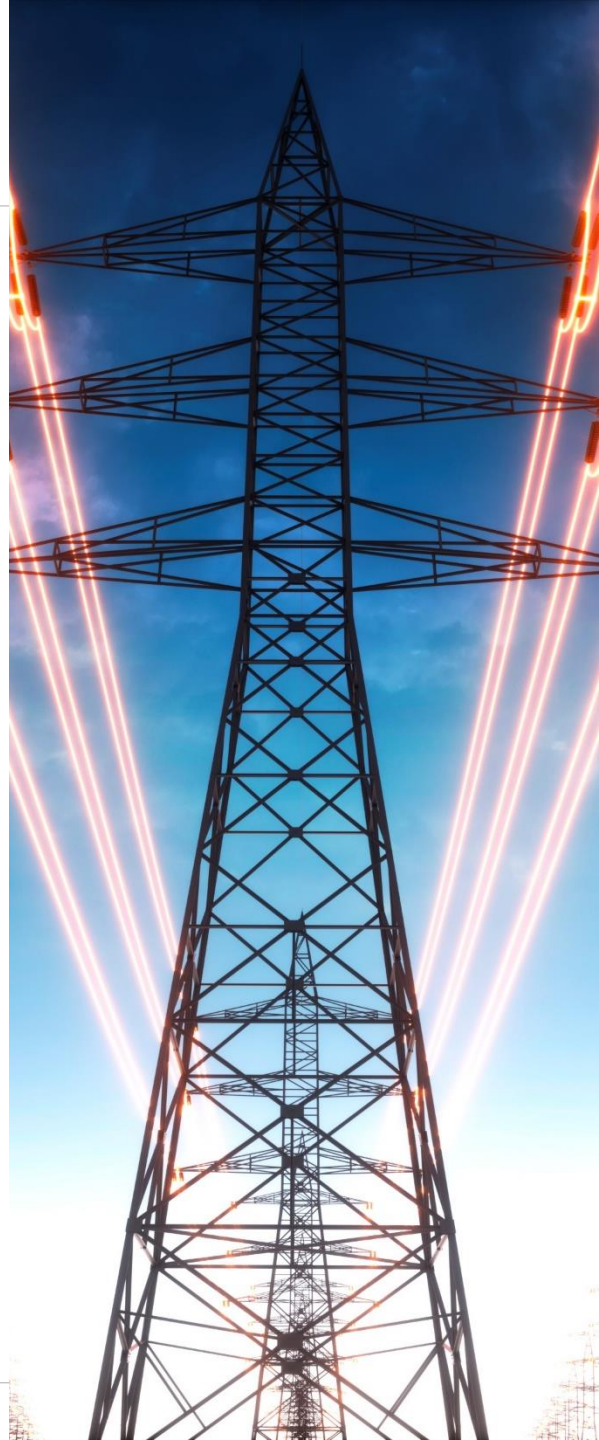
Many other markets have yet to establish a capacity market-type mechanism.

In Germany, for example, although a large-scale capacity market has been previously rejected, the government has considered plans to introduce tenders for 500MW for plants with a capacity of 10MW minimum, which can produce electricity at full load for at least 96 consecutive hours.

In 2023, the Spanish government announced capacity auctions for demand connection at nodes on the transmission network with voltages of 220kV or higher for cases where it was not possible to meet all demand connection applications.

Spain's transmission system operator has now announced the nodes concerned. These connection points are located across various Spanish autonomous regions.

The tender processes are expected to be held during 2025.



16 Measures to circumvent critical mineral supply chain challenges

China has an important role to play in the global energy system as both a major importer and consumer of hydrocarbons and the world's leading supplier of energy transition technologies and components.

With Beijing's energy policy linked to the country's regional and foreign policies, tensions in the South China Sea or in trade relations with the US and Europe will continue to cause uncertainty in global energy markets.

China's dominance of the clean energy supply chain continues to be a challenge for Western governments and most are taking steps to reduce their dependence on Chinese supplies.

The US Inflation Reduction Act is the most prominent of these measures, supporting domestic production and investment across the supply chain.

The EU's 2024 Critical Raw Materials Act is also intended to limit dependence on a dominant third country supply.

Governments will likely seek to explore twin tracks of alternative supplies as well as innovation in technologies to circumvent the need for certain critical minerals.

Developing projects to source alternative supplies is, however, time consuming and expensive thus the effectiveness of such measures is, so far, constrained.

Seeking to keep up with China on the innovation side will also remain a challenge over the coming years.

In the US, President-elect Trump has vowed to repeal all or parts of the Inflation Reduction Act. Experts suggest, however, that a full repeal of the Inflation Reduction Act is highly unlikely, especially given the number of Republican states and districts benefitting from the law.

Instead, it is expected that modifications will be made on a case-by-case basis, focusing on areas such as tax credits for electric vehicles and unspent grant money from the Department of Energy.

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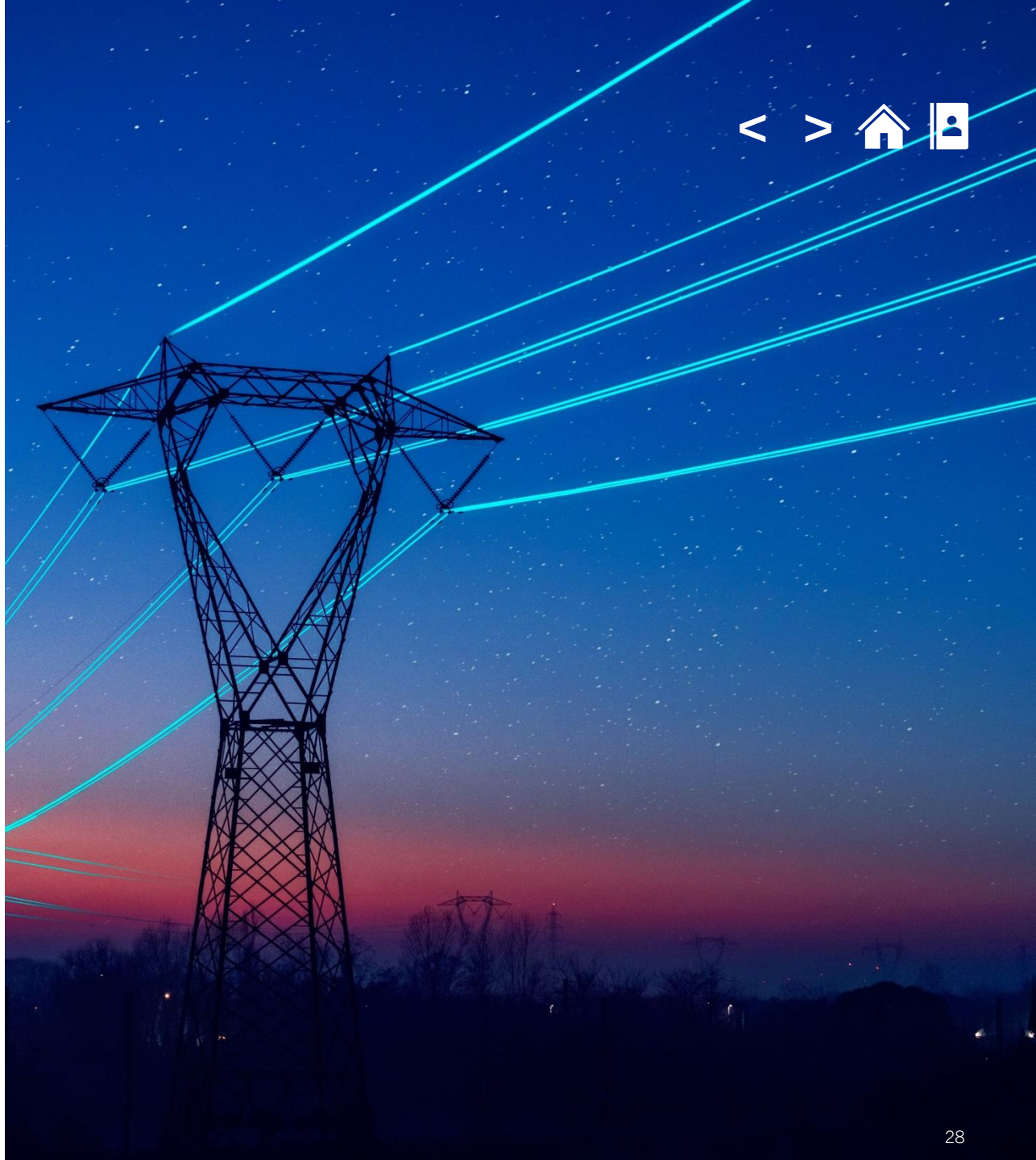
Energy & Infrastructure Legal Outlook 2025

Bridging the financing gap



17 Bridging the financing gap

The shift is underway

There has been a big shift towards more clean energy investment in recent times. International Energy Agency figures anticipated US$2trn of clean energy and infrastructure investment during 2024. For every US$1 invested in unabated fossil fuels in 2024, US$10 were expected to fund clean energy. Ten years ago, this ratio was 1:2.

Much more money is needed, however. The International Energy Agency has previously said that US$4.5trn a year is needed by the early 2030s to reach net zero by 2050.

With that background, we anticipate that the focus on clean energy spending is set to continue in 2025. Governments and corporates are under pressure to continue to decarbonise in the light of ever more compelling science to back up the dangers (and economic impact) of climate change. With governments also concerned about energy security and locking in opportunities for job creation and economic growth in the clean energy sector, many jurisdictions are seeking to create positive market signals and offer collaborative models to attract private finance.

Globally, government policies, regulations and incentives are aimed at increasing investment in a range of low carbon energy projects. Policy and regulation is also driving fossil fuel investment in climate mitigation technologies such as CCUS.

Greenfield projects and markets

In H1 2024, the number of greenfield energy projects reaching financial close globally was on par with the same period in 2023, which overall reached a high point for the sector. The key role of LNG in the energy transition has been underscored by various large US LNG projects reaching financial close, with more projects expected in the next year.

According to IJ Global figures, renewables projects comprised three quarters of total investment in Europe in 2023 and H1 2024 and over 90% of project volume, reflecting a steep decline in fossil fuel use in the region.

In the greenfield offshore wind market, there remains plenty of bank liquidity globally. Offshore wind is now a mature, proven proposition. Strong policy frameworks in many jurisdictions have provided certainty for investors and funders; the economics, broadly, continue to remain attractive.

Nonetheless, the backdrop of supply chain risks and cost challenges on top of specific challenges in certain markets (such as the potential slow-down of offshore wind permitting in the US under the incoming administration and uncertainty about electricity pricing in the UK) may mean risk allocation is rebalanced in favour of lenders.

The higher interest rate environment has also increased financing costs for energy projects, in particular capital-intensive clean energy projects such as offshore wind.

Some of these increases have been partially offset by a slight easing in the supply chain pressures, however, and the interest rate environment is expected to improve slightly over the coming year.

The rise of hybrid financing arrangements and financial sponsors

As new types of funds and financial institutions continue to expand their financing into energy transition assets, developers are increasingly looking to hybrid financing arrangements which bring in funders not traditionally familiar with project finance assets and structures.

The risk inherent in some of the newer low carbon technology projects (such as gigafactories and CCUS) is often uncomfortable territory for such funders. In some instances, innovation in insurance markets can help share such risks.

In the majority of these cases, however, lenders will be looking for additional contingency, cash sweeps, enhanced distribution restrictions and potentially even some form of equity completion support.

17 Bridging the financing gap

Nonetheless, emerging energy transition technologies such as energy storage and hydrogen are seeing growing levels of investment; a number of large commercial scale hydrogen projects, such as the UK's Net Zero Teesside, have recently closed or are in financing negotiations.

Later in the project life cycle, the renewables sector is increasingly becoming a favoured acquisition target of financial sponsors, with their M&A value and volume market share growing consistently since 2019.

Barriers to increased flow of private capital

For the nascent low carbon projects such as CCUS and hydrogen, a key barrier to funding continues to be uncertainty about the demand risk.

With independent markets for hydrogen and carbon capture not yet established, it is harder for financial institutions of all veins to have the confidence and conviction in the secure revenue streams needed to ensure funds are repaid.

In the UK, one of the ways the government has tried to address an element of this risk in the hydrogen market is by recommending the blending of up to 20% hydrogen into the existing gas network. While this falls short of the government taking the role of an offtaker of last resort, it does provide some comfort around the longer-term market for hydrogen in the UK.

Given the continued competition for renewable subsidies and supply chain pressure, developers are increasingly trying to de-link the construction timetable for their projects from being successful in subsidy bidding rounds.

Instead, developers are looking to whether CPPAs can provide all (or at least part) of the solution.

However, CPPAs are not without their own challenges both in terms of volume and duration as well as the expectations of offtakers not always being easy to reconcile with the requirements of project finance lenders (for example, credit support requirements).

As a result, for offshore wind projects, many developers are seeking to adopt a "revenue stacking" approach comprising a mix of CPPAs, CfDs and/or merchant risk.

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