Carbon capture and storage: Has the insurance market adequately responded to operator needs?

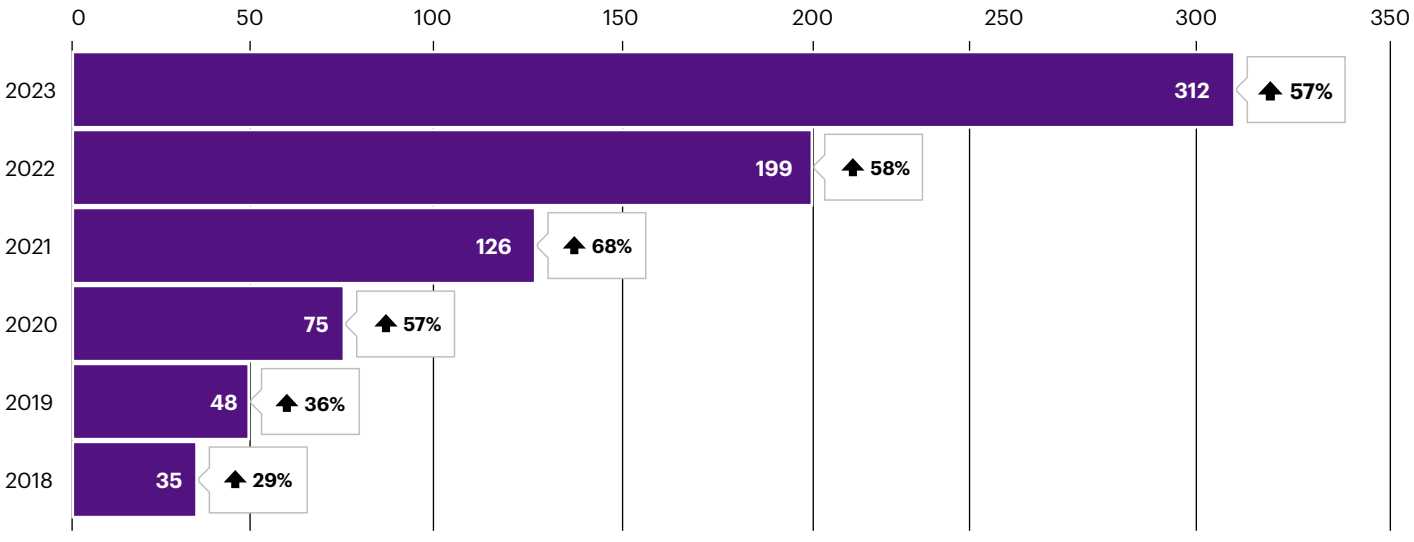
With key climate milestones rapidly approaching, the energy transition is at the forefront of many oil and gas companies' minds, as they continue investing in carbon capture and storage (CCS) projects to abate their emissions. Between 2022 and 2023, the number of CCS projects in construction and development increased by 57%.

The pace of deployment will continue to increase with over 855 Mtpa of carbon capture capacity to be in operation by 2030 globally, 74.5% of which will be from projects based in the U.K. EU, or U.S. — see Figure 2 overleaf.

Figure 1:

Year-on-year growth in capture capacity of CCS projects in construction and development (Mtpa CO_2)

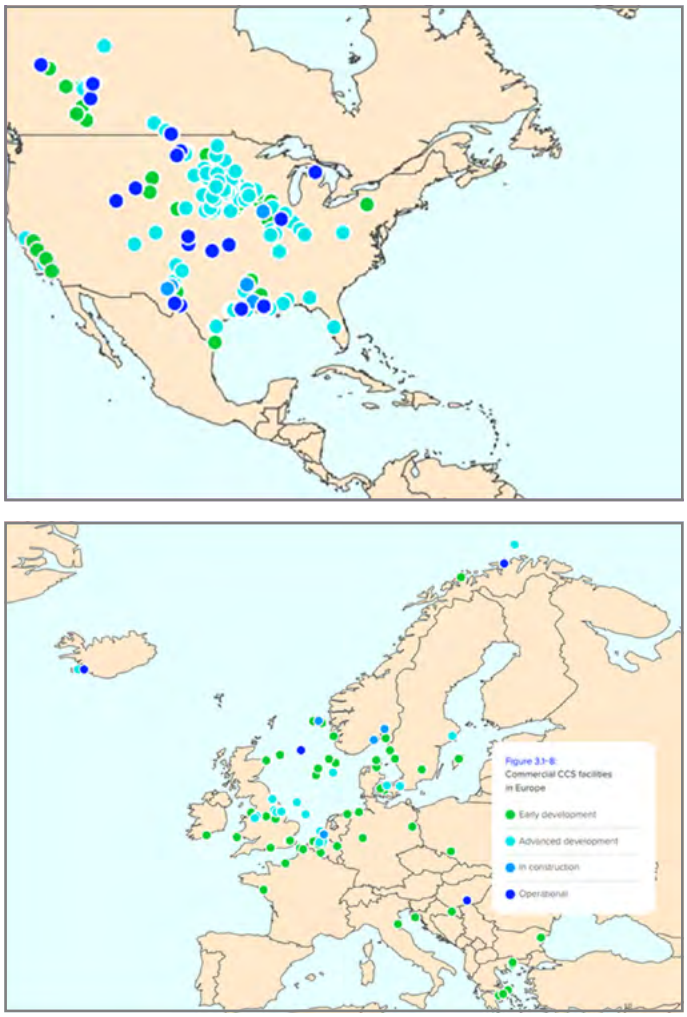
(excludes capacity in operation).



Source: Global status of CCS 2023 — scaling up through 2030 (2023) Global CCS Institute.
https://www.globalccsinstitute.com/wp-content/uploads/2024/01/Global-Status-of-CCS-Report-1.pdf

Figure 2:

Global status of CCS projects, 2023



Source: Global CCS Institute

The coming years will be crucial in the implementation of this technology as 83% of global CCS projects are still in the development stage (1). With potential projects ranging from small local solutions to large new international CCS networks, what should CCS stakeholders be conscious of when prioritising regional investment decisions and the associated risks? We will examine how the different regulatory regimes in the key CCS jurisdictions of the U.K., EU, and U.S. incentivise CCS investment and how these regulatory differences alter the risk requirements potential investors should consider.

The regulatory regimes

The U.K. is one of the top five countries globally for CCS deployment.[1] A staunch supporter of the technology, it has committed to '20 in 20' by investing £20 billion in the next 20 years to boost the early development of CCS projects.[2] The North Sea Transition Authority (NSTA) is responsible for regulation that drives the energy transition and ensures that upstream emissions are cut by 50% by 2030, of which CCS is billed as an important solution.[3,4] Its sole stakeholder is the Department for Energy Security and Net Zero (DESNZ), who provide funding support on behalf of the U.K. Government for CCS projects and stipulates the insurance requirements for such projects. To be eligible for funding support, the transport and storage operator (T&SCo) must follow an insurance schedule.[5] This includes the "specification for insured risks and insured losses" for which they must evidence a regular attempt ("at least every twelve months") at gaining commercial insurance coverage from insurers of a "good standing". If commercial insurance is in place but a claim is larger than the limit of the policy, the Secretary of State (SoS) will pay the excess (only if the 'primary insurance provider(s)' have settled the rest of the claim). The SoS has the right to review whether the T&SCo has adequately tested commercial insurance. Confirmation can come from independent brokers, emphasising the importance of appointing a trusted broker who can evidence market testing, possibly achieve coverage, and support your bespoke CCS insurance needs.

Europe is a region that has seen many early adopters of CCS technology and regulation, particularly in the Nordics. The region's CCS regulatory landscape is largely influenced by the European Union (EU), with most of the countries in Europe also member states of the EU. Whilst the EU's CCS Directive outlines the regulatory framework for CCS, the choice remains with the member states to decide which carbon storage sites are permitted.[6] The operator of the site must establish an agreed level of financial security before the injection of CO_2 starts, to ensure that the requirements of the Emissions Trading Directive are met.[7] Business interruption policies can provide key support to injectors if the injection process is disrupted. Here, a key consideration is the environmental liability that lies with the operator, with the risk of surrendering emission allowances (as part of the Emissions Trading Scheme) in the case of leakage.[6]

The regulatory regimes

The U.S. is the top country globally for CCS deployment[1] and like the U.K., CCS has received firm policy support, most beneficially at a federal level. Here, the Inflation Reduction Act (IRA) offers $369 billion to support infrastructure reinvestment and clean energy development, including CCS.[8] Any project that commences construction in the next ten years will be eligible for an increased credit value of the current Section 45Q tax credit as well as an extension of its coverage to include CCUS alongside enhanced oil recovery (EOR) and direct air capture (DAC) and allowing smaller facilities and the owners of the facilities, not just the operator to be eligible.[9] The credit can be claimed by the taxpayer per metric tonne of carbon oxides captured and stored that would otherwise have been emitted into the atmosphere. For example, if a leakage occurs and the CO_2 fails to be stored, liability is the taxpayer's, i.e. the party who is seeking to claim the credit (the T&SCo).[10] The federal support detailed has led to a boom in exploration of CCS opportunities, which has only been tempered by the complexities of Class VI well status being controlled by the federal level U.S. Environmental Protection Agency (EPA), with few states having primacy over these decisions.

Cross-territory CCS networks are now emerging as a business model. Networks capture at the emission site before transporting the CO_2 to a different facility, either by pipeline or ship, the first example of a project of this nature is Northern Lights in Norway. Shipments are transported to the storage site from the Netherlands and other emitters in Norway via liquified CO_2 vessels.[11] One key challenge for the future development of CCS networks is a piece of legislation called the London Protocol. This is an international treaty that categorises CO_2 streams for sequestration as a waste product to protect and preserve the oceans.[12] As a waste product, CO_2's transportation to offshore storage facilities and the storage below the seabed was prohibited. To be able to do both crucial components of CCS networks, contracting parties must apply for provisional licenses for projects in their jurisdiction, notify the International Maritime Organisation of their intention to store CO_2 subsea and sign a bilateral agreement with the country they wish to send/receive a shipment from. So far, seven countries have applied for a provisional licence, namely the U.K., Netherlands, Belgium, Republic of Korea, Denmark, Sweden, and Norway.[13] The key risks associated with marine shipment of CO_2 relate to the liquification and compression processes that allow a greater quantity to be moved. With this comes the need for specific marine transportation insurance products covering marine cargo, pollution liability, marine general liability, marine hull, and Protection (P&I) and Indemnity.

CCS insurance considerations

For the capture and storage stages of the CCS value chain, the insurance market considers many of the associated risks to be within business-as-usual appetite. Whether this be risks associated with the construction of capture technology, or the transport of CO_2 through pipeline, the market has comfortably understood these risks for several years and provided cover on this basis. One potential coverage gap in this space, is the risk associated with the tax incentives claimed for the emitter of CO_2. In the instances where this CO_2 is not captured at the expected rate, or the volume of CO_2 permanently stored does not equal the volumes claimed, there emerges a tax liability that the emitter may be responsible for. Tax insurance markets are emerging to fill this gap but is it a nascent product area given the relatively new changes to the 45Q credits.

Conversely, insurance coverage for the storage project is much more troublesome in some areas. If injection of CO_2 into a storage site is prevented, for example by leakage (perhaps through a geological fault or inadequate storage integrity), then many regulators require the T&SCo to fix the leak before it resumes operations to store CO_2. In this case, the T&SCo will not receive income during the outage period and a business interruption (BI) policy can be purchased to cover the lost income during the leakage, indemnifying the T&SCo for lost income. This coverage could be extended to cover the emitters whose income stream may be impacted by their inability to offload CO_2. In U.K. and EU regulation (U.K. licensing was created in line with the EU Directive 2009/31/EC under Section 7 of the 2008 Energy Act), the T&SCo does not owe the emitter as the regulatory models provide for this coverage. In the U.S., the ultimate responsibility falls on the T&SCo to repay the 45Q tax credit.[9] The precise terms of this will depend on the terms agreed in the contract between the T&SCo and the emitter.

For damage caused to the environment such as groundwater pollution or marine life degradation, environmental impairment liability insurance (EIL) can provide coverage. This incorporates cover for the costs associated with clean up (for sudden and gradual pollution), third-party claims, legal costs, and expenses. This may be a necessary purchase for CCS T&SCo's in the U.K. (if it is commercially viable), Europe and the U.S. as the T&SCo is the one who is liable in the case of environmental damage.

After the useful life of the asset is complete and the CCS storage facility and wells are closed, there is still the potential for (long-term) liability post closure, for example from the leakage of CO^2. Despite emerging research from the U.K. showing exceptionally low leakage probability from the geological studies that have been conducted, the T&SCo remains responsible until the relevant authority agrees the license can be terminated (up to 20 years) post-closure.[14] In the U.S., some states have a similar timeframe, but the Federal regulator has limited long term liability responsibilities. For example, in Wyoming liability ends after 20 years post completion[15]; whilst in North Dakota it is not even half that at 10 years.[16] California requires T&SCo's to monitor CO_2 plume movement for 100 years after injection is completed.[17] On the contrary, in Illinois the state assumes liability immediately after the well is closed.[18] In the EU, Member State governments must cover, at a minimum, the anticipated cost of monitoring for a period of 30 years.[6]

Given the long-term responsibility for liability on the T&SCo post-closure in the U.K. and U.S. (and potentially EU depending on the terms of the T&SCo to Government handover), the emphasis firmly remains on the operator to protect themselves, possibly via long term insurance against CO_2 leakage. Good collaboration between Government and insurance stakeholders has helped to bridge the technical knowledge gap between the two and is certainly appreciated by the latter. The insurance market and T&SCo's must continue to work together to find appropriate liability solutions to match corporate, regulator and insurer risk appetite. Employing new and long-term monitoring technologies post-closure of a carbon capture site will provide insurers with confidence when quantifying leakage events. This is reliant upon the degree to which financial liability support from government regulators is provided as this will provide clarity concerning the gap in support which insurers must respond to.

Conclusion

The differences in regulation between the U.K. and Europe are minimal with strong alignment between the two regions. However, there is a wide variation between the US and the U.K. & Europe, whereby transporters, operators, insurers, and other stakeholders must be alert to these differences when considering their insurance requirements and investment decisions. The key insurance implications from this article can be categorised into pre- and post-injection. Pre-injection insurance considerations concern physical damage, business interruption, tax insurance and third-party liability policies to cover for damaged plant, lost income, and potential environmental liability for CO_2 leakage. Post-injection insurance requirements should focus on the liability of leakage from a sealed reservoir.

The CCS market is forecast to grow rapidly over the coming years, and the insurance market will need to match this pace of development if the technology is to deliver the intended benefits to society and the environment.

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