

**Slaughter and May Podcast**

**Carbon Capture and Storage (CCS): Assessing support for UK capture projects**

<b>Oliver Moir</b>	<p>Welcome everyone. My name is Oly Moir and I am a partner in our Infrastructure, Energy and Natural Resources practice. Today I'm joined by Rory Botros and Iain McCann, associates working with me in our IEN team, and Kathryn Emmett, our PSL counsel. Welcome all.</p> <p>As a group, we've been following very closely the detail of the government support packages proposed for carbon capture and storage projects which will be the focus of our discussion today. But before we look at the detail, it's worth briefly recapping on why we're talking about carbon capture and storage in the UK.</p> <p>The sector has had a few false starts but the commitment and momentum is very much with the sector now, driven by the government's wider agenda to achieve net zero by 2050. To do this, the independent Climate Change Committee has identified that CCUS is a necessary part of the UK's response.</p>
<b>Kathryn Emmett</b>	<p>That's right Oly, and we've seen a huge amount of activity in the sector and a lot of clients are now actively involved in UK CCUS projects. And all this is all driven by the decarbonisation agenda you mentioned.</p> <p>The ambition is to capture and store 20-30 million tonnes of carbon emissions per year by 2030 across the UK economy. To do this, the government plans to bring forward four CCUS-enabled industrial clusters, with two clusters to be established by the mid-2020s, and a further two industrial clusters by 2030.</p> <p>The UK has great offshore geological storage potential. Following an application process called Phase 1 of the Cluster Sequencing process, the government has confirmed those clusters which it intends to take forwards to negotiations. These are HyNet and the East Coast Cluster. A reserve cluster was also identified in Scotland which may be brought into negotiations should it not be possible to reach agreement with these two shortlisted clusters.</p>
<b>Oliver Moir</b>	<p>Thank you Kathryn.</p> <p>The UK ambition of course relies on carbon actually being captured. However, the cost of installing and operating capturing carbon capture equipment – together with the cost of transporting and storing that carbon once captured – is currently prohibitively expensive and therefore requires government support. And the government has recognised that and has been developing business models to support these projects over the last couple of years, which are now at an advanced stage.</p>

	<p>So let's focus on these business models. Rory and Iain, what support is available and how it will be allocated?</p>
<p><b>Rory Botros</b></p>	<p>Yeah, sure Oly - so, there are two separate business models proposed for capture plants, that we're going to focus on today. The first of those is the business model for power plants, which I'll be covering – this model is aimed at supporting gas fired power plants with CCS (both new build and retrofit). And secondly – there is the Industrial CCS business model, which Iain will be covering – this is aimed at industrial plants (again both new build or retrofit) looking to incorporate CCS into their process.</p> <p>Now, taking power plants first - parties can apply for support under what's called a dispatchable power agreement, or DPA, which would be entered into between the generator and the Low Carbon Contracts Company. Generators will receive support payments, which we'll come onto, for an initial term of between 10 to 15 years and we will probably start seeing the first of these being signed towards the middle of next year. It's worth adding here that the terms of the DPA are heavily based on the renewables contracts for difference, which were so successful.</p>
<p><b>Iain McCann</b></p>	<p>So as Rory mentioned, I'll be covering the ICC business model which provides support to eligible industrial facilities for an initial 10 year period, with an option to extend for a further 5 year period.</p> <p>Projects that have applied through Phase 2 may also be able to access capital grant funding. Now I won't go into too much detail on that today but very briefly that could involve grant funding for up to 50% of total capital costs but unsurprisingly any such funding would be subject to affordability, value for money and subsidy control considerations.</p>
<p><b>Oliver Moir</b></p>	<p>Thanks both.</p> <p>Yes, the current focus is very much on power plants and industrial plants using carbon capture technology.</p> <p>We should also mention that the industrial carbon capture support will cover retrofitting carbon capture onto existing hydrogen production plants that currently use natural gas in a process called steam methane reformation to produce hydrogen but which are currently unabated and this is so called "grey" hydrogen.</p> <p>There are also plans for new build hydrogen plants with CCS, but they are supported under a different business model specifically designed for hydrogen production. I'll be discussing that with Kathryn in a separate podcast.</p>

<p><b>Kathryn Emmett</b></p>	<p>And just to add one further point there, Oly, there will be more policy to come on CCUS in other areas, we're expecting a Biomass Strategy which will set out the government's policy on Bio-energy with carbon capture and storage (known as BECCS) so the Government last released materials on this more than 6 months ago and there has been more or less radio silence since then and there no mention in the recent energy bill, so hopefully the government will make its position clear in the coming months.</p>
<p><b>Oliver Moir</b></p>	<p>Thanks, Kathryn, indeed. And all this is of course is predicated on there being networks to transport and store these emissions.</p>
<p><b>T&amp;S</b></p>	<p>Yes. The transport and storage networks are significant infrastructure investments comprising onshore and offshore pipelines linked to sub-sea storage sites. The government estimate that £15 billion of private investment will be needed to 2037 to build these networks in the UK.</p> <p>Now here, the support model is very different to the carbon capture side of things. Much like the UK's gas and electricity grids, the plan is that these networks will be run by the private sector and will receive a regulated return set by the UK's gas and electricity regulator, Ofgem, under what's known as an economic regulatory regime. The T&amp;S company will collect an allowed revenue, essentially an economic regulatory return on agreed levels of efficient expenditure and a regulated asset value (representing the capital investment into the T&amp;S network). A similar RAB-based model is also being proposed for new nuclear.</p> <p>Eventually the expectation is that demand for carbon transport and storage will be such that user fees will meet the allowed revenues. But, until that market develops, additional support is needed. So initially, as well as this economic licence, there will be additional support.</p> <p>Proposals include revenue support, so insulating the T&amp;S Co from gaps in recovery of allowed revenues from users. And in addition, a government support package is proposed to mitigate high impact and low probability risks such as the unavailability of insurance for the risk of carbon leakage and the risk of the network becoming a stranded asset due to low user levels – this whole package is called the T&amp;S Regulatory Investment (or TRI) model. The TRI is currently being negotiated with the first two clusters that I mentioned.</p>
<p><b>Oliver Moir</b></p>	<p>Thanks Kathryn.</p> <p>So – Rory and Iain – you've been all over the detail of the draft DPA and ICC contracts – stretching to hundreds of pages. How is the government going to make sure that these projects are delivered and contribute to the UK's net zero target? What are the contractual levers</p>

	<p>the government has to make sure these technologies will be constructed?</p>
<p><b>Rory Botros</b></p>	<p>Yeah, I can start with the DPA, Oly – one of the main contractual levers deployed here will be the conditions precedent that need to be satisfied by the generator throughout the development and the construction phase. Notably, failure to comply with the conditions precedent can give rise to a termination right for the Low Carbon Contracts Company.</p> <p>To give a couple of examples, projects must either deploy 10% of total anticipated pre-commissioning costs or have reached FID within 18 months of signing the DPA. ~And we know from the experience of developers under the renewable CfDs, which have a similar mechanic, that this has the potential to put generators at a disadvantage when negotiating with suppliers given the in-built time pressure there. And in terms of actually bringing the plants on-line, well a generator must demonstrate that it has met a set of Operational Conditions Precedent during a 12 month period known as the Target Commissioning Window. A key question will be whether the Operational Conditions Precedent are in fact deliverable, given that these are relatively new technologies and there is little precedent here.</p>
<p><b>Iain McCann</b></p>	<p>Unsurprisingly, like the DPA, the ICC includes various conditions precedent that need to be met, combined with a longstop date which triggers a termination right if those CPs haven't been satisfied. Now one of the CPs that's likely to attract particular scrutiny is that, for the start date to occur, the project would need to achieve a capture rate of at least 85% or, indeed, higher, if that project's applied for support on the basis of a higher capture rate.</p> <p>Also if a project's not commissioned by 31 December 2027 then, subject to certain extensions for events like force majeure, the contract term will be eroded by that time period from 31 December 2027 until satisfaction of the CPs. So you start to lose your initial 10 year term.</p>
<p><b>Oliver Moir</b></p>	<p>Thank you both. Yes, managing that construction risk and ensuring that projects are delivered without compromising the support under the business models will of course be a key concern.</p> <p>But let's dig a little deeper and look at the key terms of the carbon capture plant contracts which were published last month which will be areas of focus for our clients</p> <p>So first and most importantly Pricing: Can you explain the support received by a power plant with carbon capture and by an industrial capture plant?</p>

<p><b>Rory Botros</b></p>	<p>Yes sure Oly, so for Power CCS, the DPA provides for two kinds of support payments. The first of those is an availability-based payment (which is index-linked to CPI during the term). This availability payment is intended to provide investors with a regular payment based on the availability of low carbon generation capacity, but it will be reduced in the case of outages or poor performance against the expected capture rate. And then there is a variable payment which will account for the additional cost of generation for a power CCS plant compared to an unabated plant - for example, the power CCS plant will have higher gas costs than its unabated equivalent due to the additional thermal energy required to operate the capture unit. So the variable payment is intended to cover that delta all with the aim of putting the CCS facility in an economic position to dispatch ahead of the unabated equivalent.</p>
<p><b>Iain McCann</b></p>	<p>And the payment structure under the ICC contract is a little different to that. The contract includes capex and opex payments, both of which will be individually negotiated for each contract.</p> <p>Taking capex payment first, the payment will be a fixed amount for each tonne of CO2 captured and the idea is that capex will be repaid after 5 years of operations but if capex isn't repaid in that first 5 years, then payments can be extended for up to 10 years.</p> <p>The opex payment on the other hand is the parts of the ICC that broadly follows the pricing structure in a CfD contract – so it's a payment for the difference between the reference price and the negotiated strike price again for each tonne of CO2 captured. The reference price is intended to imitate the 'avoided' costs of the carbon price of the IC or in other words, costs that the facility would otherwise pay to buy allowances for their unabated emissions and the idea here is that the reference price will be stepped up over the initial ten-year term of the contract on the basis of the historical growth in carbon prices. If the contract is extended beyond the first 10 years then the reference price would switch to follow the market carbon price at the time.</p>
<p><b>Oliver Moir</b></p>	<p><i>Thanks Iain. In connection to the separately owned and operated T&amp;S network is of course of critical importance to a carbon capture plant: can you talk us through some of the issues that people are grappling with on that front?</i></p>
<p><b>Iain McCann</b></p>	<p>Yes, absolutely Ollie, so the interdependency and cross-chain risk with the T&amp;S network is a really fundamental aspect of the DPA and ICC business models.</p> <p>And the industry is really focused on this as it goes straight to questions about whether the business model is an investable proposition. The issue crops up in different ways across the life of the business models,</p>

	<p>so for example, at the start of a facility moving into the ICC business model there is uncertainty as to how requirements relating to entering into T&amp;S arrangements would align with the timing of the T&amp;S business model. Then there are questions to answer at the end of the contracts because continued access to the T&amp;S network will be absolutely critical to avoid carbon leakage and without an understanding of the process following the end of the contract term investors may have concerns that these assets become stranded.</p>
<p><b>Oliver Moir</b></p>	<p>Thanks Iain and more specifically how do the agreements deal with a delay to commissioning of the T&amp;S network and then any interruption to T&amp;S operations once it is commissioned.</p>
<p><b>Rory Botros</b></p>	<p>Yes, so starting with the DPA, the contract deals with this in a number of areas. Just to pull out a couple of examples:</p> <p>As Iain just mentioned one of the CPs is a requirement to demonstrate that the Facility has connected to a Transport &amp; Storage Network. Now, to mitigate against the risks that arise if the T&amp;S Network is not completed to schedule, the DPA does offer some relief (in the form of a day for day extension to the relevant deadline or, if the plant is otherwise ready to go, a waiver of that CP) in the scenario where that unavailability is caused by reasons outside of the generators control.</p> <p>But the obvious question is then what happens in the worst case scenario if the Generator can't access the T&amp;S Network for a really prolonged period? And the answer to that is that the DPA does provide the LCCC (a note not the generator) with a termination right in these circumstances. There is a lot of detail in the contract on this and we don't have the time to go into all of it today but in summary there is a lengthy process which needs to be followed and managed by the generator prior to this termination right actually arising (including the preparation of an alternative solution plan where feasible).</p>
<p><b>Iain McCann</b></p>	<p>Yes and the ICC is generally aligned with the DPA here. Rory mentions the alternative solution which is interesting because from our perspective, the fact that the onus is on the emitter to find a solution seems an odd position – how does this work, for example, for smaller emitters which may not have the resources to find an alternative solution? And there is also uncertainty as to how well this approach would work for early projects because the availability of alternative solutions will presumably be much more limited for those early projects. I think that on a lot of these issues industries waiting for the publication of the T&amp;S network codes to properly evaluate these risks, but these are clearly issues that are going to be fundamental in the success of these business models in attracting investment.</p>

	<p>And another key concern around the investability of the ICC business model is that compensation won't be provided for lost product revenue as a result of a T&amp;S outage. So to give an example of that, there wouldn't be any compensation for a products attracting a lower market value because it can't be certified as being low carbon due to that T&amp;S outage.</p>
<p><b>Kathryn Emmett</b></p>	<p>Yes and there were also levers which will encourage the T&amp;S Company to construct the network, connect users and to keep the network operational so for example, there are financial implications if there is a delay in construction: allowed revenues will be withheld from the T&amp;S Company until operations start, and also construction delays will stop the further accrual of WACC on allowed spend (which is essentially the cost of capital for the T&amp;S Company during construction).</p> <p>And then once the network is operational there will be an availability incentive that rewards high levels of availability and penalises poor availability, albeit with allowances for planned outages.</p>
<p><b>Oliver Moir</b></p>	<p>But ultimately, if the T&amp;S network fails and is permanently unavailable, the key question for developers, investors and funders will be what happens if there's a termination event due to the unavailability of the T&amp;S network. Is there any compensation payable under the draft agreements?</p>
<p><b>Rory Botros</b></p>	<p>Yes there is, Oly. So under the DPA, if the contract is terminated due to one of those events we just mentioned, then the Generator will receive compensation for it's irrecoverable and unavoidable out-of-pocket costs. Such costs might include development and pre-development costs; decommissioning costs; construction costs and financing and contractual break costs (but notably excluding any other finance costs).</p>
<p><b>Iain McCann</b></p>	<p>And the ICC has broadly the same concept of a termination payment including the costs that [Rory] has just outlined. It is worth noting that in the ICC context, the payment would be capped at the total capex payment under the contract.</p>
<p><b>Oliver Moir</b></p>	<p>Thanks both and looking at other termination rights and the right to compensation and termination – these will inevitably be closely scrutinised. We don't have time to go through them all, but were there any in particular which stood out to you?</p>
<p><b>Rory Botros</b></p>	<p>Yeh one which really stood out for me under the DPA was the termination rights which will be triggered if a Generator's average capture rate falls below 70% in 3 Billing Periods within a rolling 6 months. As we mentioned earlier, given that these are first of a kind projects any delivery and technical requirements will need to be closely scrutinised by the industry to ensure that they are deliverable.</p>

<p><b>Iain McCann</b></p>	<p>Agreed Rory that one stood out in the ICC context as well although the percentage tests are slightly different.</p> <p>In terms of other terminations that seemed worth noting in the ICC context there were termination rights relating to metering and other data. So for example, if any metering data is misleading in any respect then termination rights arise and, crucially, the contract doesn't provide for a right to remedy that breach and therefore avoid termination. Now these termination rights and particularly those that act as hair-trigger termination rights, may be of concern to potential investors considering the investability of the business model.</p>
<p><b>Oliver Moir</b></p>	<p>Thanks Iain. There's another part of the proposals which caught my eye relating to the DPA contract. Rory, can you explain the gain share mechanism and what it might mean for investors?</p>
<p><b>Rory Botros</b></p>	<p>Yes sure – so, in October of last year, BEIS informed the industry that they were considering whether the introduction of a gain share mechanism in the DPA might be necessary to ensure that the DPA reflected value for money for the consumer and now BEIS have developed that mechanism and in summary it proposes 2 types of gain share, if a Generator's profits exceed an agreed equity IRR threshold.</p> <p>So the first of those is a "project gain share" where Projects would be required to pay 30% of profits above the agreed equity IRR threshold to the LCCC every 5 years; and then there is also a "sale gain share" where the sale of a material economic interest in the Generator before a specified date will also result in a 30% share of the profits on that disposal above the agreed equity IRR threshold.</p> <p>Now there's a lot to unpack there and we don't have the time to go into all of this fully but one key question the industry will be asking itself is whether a gain share is actually appropriate for first of a kind projects, particularly a gain share on project profits, given that developers are taking a risk on these first of a kind project and ultimately it's the upside which incentivises them to do so.</p>
<p><b>Oliver Moir</b></p>	<p>Thank you Rory – and thank you Iain and Kathryn. That was somewhat of a whistlestop tour of where we are with the CCS business models; there is evidently a lot of details to get to grips with for each of the DPA, the ICC and the T&amp;S regime – please do not hesitate to get in touch with us if you wanted to delve into any of those points further. And of course CCS is not the only low carbon technology being promoted by the Government delivering at zero.</p> <p>Low carbon hydrogen is also a major focus and is the subject of a separate podcast released simultaneously with this one - that's</p>



	<p>available on the SM podcast series, on our website and wherever you get your podcasts.</p>
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*Thank you for listening.*