

Reuse of oil and gas assets for CCUS projects

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Introduction

The quickening pace of the decommissioning of offshore oil and gas installations coincides with a renewal of interest in carbon sequestration under the UK Continental Shelf. The possibility that infrastructure being considered for decommissioning could be reused for CCS must already be addressed in an abandonment programme, and where such reuse potential has been flagged the regulator may be willing to agree to a deferral of decommissioning.

The increasing likelihood that carbon sequestration plans will begin to appear means it is imperative that opportunities to make use of redundant hydrocarbon infrastructure (whether to access depleted reservoirs or proximate formations such as saline aquifers) are not lost as a consequence of decommissioning decisions which have not taken sufficient account of the *future* reuse potential of that infrastructure.

There is accordingly a need to examine the interaction of the emergent carbon sequestration regime and the relatively better-established decommissioning regime in order to ensure that satisfying decommissioning obligations is not at the expense of the option to have efficient access in future to a reservoir or proximate formation for carbon sequestration.

We therefore welcome the opportunity to comment on BEIS's consultation on re-use of oil and gas infrastructure assets for CCUS projects¹.

Question 1: Have we identified the correct types of oil and gas infrastructure that are likely to be important for re-use in CCUS projects?

The consultation identifies the following assets:

- Depleted oil and gas reservoirs
- Wells
- Trunk pipelines
- Platforms
- Other infrastructure, including subsea manifolds and fields data

We consider that this list should also include power cables and umbilicals, and models derived from data, as well as the data itself. Wells include exploration, appraisal and production wells, and an addition to their potential for re-use, their impact on the integrity of potential CO₂ storage sites must be considered.

¹ BEIS 2019 *Re-Use of Oil and Gas Assets for Carbon Capture Usage and Storage Projects*
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/819901/reuse-oil-gas-assets-ccus-projects.pdf

Assets such as the geological data (surveys, core samples, well logs, operational and sample records, and subsurface models) gathered through oil and gas exploitation are invariant over time and will be useful over many decades of CO₂ sequestration. These are very cheaply archivable assets which will have been fully written off over the oil and gas exploitation process and will have no value other than to people and organisations wishing to work in the particular formation(s) to which they relate. These assets should be retained by default for anyone to use.

The consultation suggests that there is no strong case for government intervention to preserve the assets classed under “other infrastructure” – we disagree.

All physical depreciating assets should be considered, based on independent assessment by CCUS experts commissioned by Government. For example, there may be CCUS cost reduction in re-use of certain manifolds, buried power cables and control umbilicals, as well as partial use of existing wells. The re-use of wells is not limited to CO₂ injection: they can also be used for monitoring or pressure reduction in the oil and gas strata, or in other strata relevant to CCUS activity.

We agree that “reservoirs will have had a number of wells drilled into them which could be at risk of corrosion, especially if they are not plugged and abandoned to a carbon dioxide safe standard. It is important that reasonable actions which can mitigate corrosion are taken and form part of the carbon dioxide storage appraisal and carbon dioxide permit application processes.”

Question 2: Are there additional or different criteria that would need to be considered when assessing whether a piece of offshore infrastructure is re-useable as part of a CCUS project?

A strategic, criteria-based approach is needed to replace the current case-by-case approach to determining whether oil and gas assets should be retained for re-use. This approach needs to be taken independently of the companies that own the assets, and should consider assets associated with all potential CO₂ storage sites, not just those that have a project currently associated with them.

This is consistent with the UK Government’s waste and resources strategy, which states:

A more circular economy will see us keeping resources in use as long as possible, so we extract maximum value from them. We should recover and regenerate products and materials whenever we can, giving them a new lease of life.²

And the Scottish Government’s circular economy strategy, which states:

² HM Government (2018) *Our Waste, Our Resources: A strategy for England*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf

We want major industrial sectors to learn from best practice to optimise the value of used equipment, and will pursue opportunities including reuse of energy infrastructure.³

We are concerned that the approach to considering the suitability of assets for re-use taken in this document is the wrong way round: rather than identifying a closed set of assets that should be re-used, and assuming all others will be decommissioned, the approach should identify those assets that are definitely NOT suitable for re-use, and keep all others in scope of the policies on re-use.

This means that condition of the asset – including materials, integrity and pressure – will be the most crucial consideration. Location will be relevant, but should not exclude the asset from being covered by the policy; similarly, cost of re-use will be an issue for a CO₂ storage project to make a decision on, not an issue for BEIS.

The fact that an asset is identified as of potential value for CCUS should not mean that it *must* be incorporated into a CO₂ project.

With respect to the criteria as defined in the document:

Location

The criterion states that “assets that are close to both viable carbon dioxide storage sites and to mainland sources of carbon dioxide may be more attractive for re-use.” We consider this is overly restrictive, and could lead to viable assets being dismissed. We suggest that the words “both”/“and” should be replaced with “either”/“or”, and that “mainland” should either be replaced with “onshore,” or removed altogether.

Wells located within a reservoir may be suitable for re-purposing, either as injection well or monitoring wells. Additionally, where wells that cannot be re-used pass through or into sites that are suitable for CO₂ storage, there should be a requirement that the wells are decommissioned to a standard that protects the integrity of the store and allows CO₂ storage.

Size

Size is probably of interest for use for CO₂ storage sites, pipelines and power cables, but we do not agree that larger infrastructure is necessarily more valuable for re-use. For example, smaller pipelines might be more appropriate for early phase storage development. It is not clear whether cost comparisons have been done for very large pipelines, for example if a 36” unburied pipe were available but all a site needed really was 12” buried pipeline, would a new pipe might be better value than costs of maintaining – and ultimately decommissioning, a 36” pipeline?

³ Scottish Government (2016) *Making Things Last: A circular economy strategy for Scotland*. Available at: <https://www.gov.scot/publications/making-things-last-circular-economy-strategy-scotland/pages/2/>

Question 3: Do you agree with this preliminary assessment? Should any specific assets detailed in Table 1 or in Annex A be removed? Should any assets be added to these lists? Please provide justification using the referenced criterion for your answer.

It is not clear how this preliminary assessment was carried out. The four pipelines identified in Table 1 are certainly assets that should be retained for CCS use, but it is not clear how this adds anything to existing knowledge since those assets had already been identified in a number of reports.⁴

Table 1 is clearly not an exhaustive list even of the assets identified for potential re-use by the existing CCS projects, let alone a list of assets with potential for re-use in future.

Annex A only shows pipelines and stores. It is not clear what the status of Annex A is: is it intended to be a full list of oil and gas assets in the UKCS? If not, what criteria were used to select the assets that appear on the list? We consider that Annex A should show all the types of assets identified in section 15 (as amended following this consultation). It would also be useful if Annex A showed how each asset performed against the criteria set out in section 16 (as amended following this consultation), and a projection of the expected date for cessation of production, or decommissioning, to allow phasing to be considered.

It is clear from the Committee on Climate Change's advice to the UK Government⁵ that the four pipelines identified in Table 1, and their associated storage sites, will not on their own provide sufficient capacity to meet the UK's CO₂ storage needs to 2050 and beyond. The assessment of potential for infrastructure re-use should go beyond the five current CCS cluster proposals and take a longer term, strategic view of CCS deployment in the UK, including identifying other priority storage sites and considering assets that are expected to become available for redeployment over the period out to 2050.

We had hoped that this exercise would enable BEIS to take a strategic approach to planning the deploying of CCS in the UK, making best use of existing assets. Instead, it appears that BEIS intends to take a case-by-case approach to assessing the suitability of assets for repurposing. This is a missed opportunity, both to offer a strategic plan for the future, and to take into account other potential uses of oil and gas infrastructure consistent with UK Government's net zero and biodiversity commitments, such as re-use for hydrogen production, transport and storage, and nature conservation.

Application of the policy

At a consultation event in Edinburgh, a BEIS official stated that neither Table 1 nor Annex A lists the assets to which the policy will apply. This leaves some uncertainty about the scope and application of the policy, and how effective it will be.

⁴ E.g. ACT Acorn (2018) *D11 Infrastructure re-use*, available at: http://actacorn.eu/sites/default/files/ACT%20Acorn%20Infrastructure%20Re-use%20Report%201.0_0.pdf, Cadent (2018) *HyNet North West From Vision to Reality*. Available at: https://hynet.co.uk/app/uploads/2018/05/14368_CADENT_PROJECT_REPORT_AMENDED_v22105.pdf

⁵ Committee on Climate Change (2019) *Net Zero - The UK's contribution to stopping global warming*. Available at: <https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/>

It is not clear what the purpose is of including information on potential stores in Annex A, when the consultation does not contain any policy that applies to them. We would also be keen to know what status the storage sites listed in Annex A have: does inclusion in the annex mean that any wells associated with these sites will be required to be decommissioned to a CO₂ standard?

Question 4: Are there any additional substantial barriers to the effective transfer of assets? If yes, please provide evidence for your answer.

Section 21 recognises the mismatch in timing between cessation of production and the start of CO₂ injection. However, it does not get to the heart of the problem.

Assuming that the CO₂ storage operator will be a different company to the oil and gas operator, the key problem, as identified by the ALIGN-CCUS project, is that there is no business case for either company to have ownership of the asset (and liability for it) in this intervening period.

There is an opportunity here to think creatively about solutions that would ensure that all parties could see the economic sense in taking actions designed to ensure the future availability of relevant infrastructure, or at their very least could see no economic obstacle in this regard. Among the issues to be considered are: the point at which risk transfers from one party to another; the location of ultimate decommissioning responsibilities; access to relevant tax history/tax allowances in relation to decommissioning; and clarity on continuing liabilities for infrastructure. None of these issues is insurmountable, but will require clarification. It is interesting to note, for example, that any residual liability following hydrocarbon decommissioning rests (according to BEIS guidance) with the owner/section 29 notice holder in perpetuity; by contrast, the CCS regime under the Directive proceeds on the premise that continuing liability will ultimately transfer to the state. Whilst conceptual differences can be identified, it is equally possible to construct an argument that a unified approach would produce certainty both in relation to CCS developments from former hydrocarbon projects and, indeed, in relation to pure hydrocarbon decommissioning, which overall would serve to encourage hydrocarbon actors to look more favourably on CCS options.

Another significant barrier is the attempt to transfer decommissioning liabilities from the oil and gas regime to the CO₂ sequestration industry. CO₂ sequestration has different geological targets, geological boundaries, injection and liability timeframes, and economic, climate change and market drivers.

Question 5: Are changes to the current policy and legislative regimes needed to help facilitate the re-use of oil and gas assets for use as part of a CCUS project?

Although the policy regime around oil and gas asset re-use for CCS is not the only thing that has prevented CCS deployment in the UK so far. We support the general principle of offshore decommissioning, but what is done, and especially how that is done, will have a role to play in making CCS projects more affordable, and therefore more attractive to investors.

Assessment of the suitability of oil and gas assets for re-use should be carried out, or at least validated, by a body independent of the company with decommissioning liability, and not limited to submarine pipelines and wells. This could be a CCS transport and storage delivery company, if the Government chooses to establish such a body, or the regulator.

Question 6: Do you agree that the proposed policy is an effective and proportionate measure?

No.

The proposed policy does not address the problem that there is no business case for an oil or gas operator (that does not itself intend to carry out CO₂ storage) to retain ownership of an asset that it would otherwise decommission.

Our view is that the policy does seek to avoid the problem defined by the ALIGN-CCUS project but conflates the liabilities problems and is not what is required to enable the re-use of oil and gas assets for CCS.

The House of Commons Public Accounts Committee found that the cancellation of the 2015 CCS competition had “damaged investors’ confidence in working with the government on CCS in the future.”⁶ One way to rebuild that trust, and demonstrate its commitment to deploying CCS, would be for Government to take on the ownership of, and liability for, assets that have the potential for re-use for CCS between cessation of production and development of CO₂ storage. Asset owners could be required to bring their asset to a certain standard before transferring it to the Government: this could include deactivating wells in a way that allows them to be reactivated for CCS purposes in future.

Application

Notwithstanding our view that the proposed policy is inadequate, we also see its application as too limited in its scope: only applying to submarine pipelines and wells for up to 10 years, and, within that set, only to assets that have been framed by assessment against the factors set out in section 16.

As it stands, we read this as a requirement only applying to the assets listed in Table 1, and would welcome clarification from BEIS on whether this is the case.

Since the policy is one which gives discretionary powers to the Secretary of State⁷, we do not see the reasoning for making it so prescriptive. We would prefer to see a policy for re-use that applies (at the Secretary of State’s discretion) to all infrastructure that has the potential for re-use for CCS.

⁶ Public Accounts Committee (2017) *Carbon Capture and Storage*. Available at <https://publications.parliament.uk/pa/cm201617/cmselect/cmpubacc/1036/1036.pdf>

⁷ We notice that the consultation uses “he” to refer to the Secretary of State. We suggest that gender-neutral pronouns should be used.

Role of the regulator and licensing authority

In addition to effective policies to encourage re-use of oil and gas assets for CCS, we consider that the role of the Oil and Gas Authority needs to be strengthened in regard to CCS, giving it a remit to promote CO₂ storage and take a much more proactive role in ensuring that, where assets are suitable and appropriate for re-use, that re-use is enabled.

It is also not clear who will regulate CO₂ transport. These functions need to be assigned and resourced to enable efficient deployment of CCS.

Question 7: What event should be used as the point at which the Secretary of State could make a decision on removal of decommissioning obligations to previous duty holders?

Notwithstanding our view that the policy as proposed is unlikely to be effective, we would recommend that the trigger point for the removal of decommissioning liability should be the point at which ownership of the asset is transferred away from the oil and gas operator: whether this is to the CO₂ storage operator, or to an operator of last resort.

The concept of 'Change of Control Relief' may be useful in so far as it has the same effect as acceptance that an asset is decommissioned.

Question 8: To what extent would the removal of the liability on previous owners to decommission a pipeline when it is transferred to a CCUS project encourage such a transaction?

The policy assumes that there will be an overlap in time of a focus on decommissioning an oil and gas asset, and an active commercial commitment on a CO₂ sequestration project. This is unlikely to be the case. Since it fails to address this temporal gap, the policy is unlikely to have much impact.

Question 9: Are there any monitoring or data collection activities, such as intelligent pigging, that it would be essential to carry out before preserving an asset for CCUS re-use?

The key is not that there is good data on the asset when it is decommissioned for O&G use, but that it can be proven fit for CO₂ use at the time in the CCUS design process that it is evaluated for incorporation into the project. Given the passage of time and unforeseen events, that will require condition surveying (such as intelligent pigging) and testing. These are reasonable costs for the CCUS project if the oil and gas asset is able to be surveyed.

Any monitoring activities that are used to determine whether an asset should be retained for reuse or decommissioned would need to be tightly regulated to avoid decommissioning being advocated as the preferred option.

Question 10: Do you agree that the period of suspension should be up to 10 years? Please provide evidence for your response.

There is little reason to suppose that CCUS projects will necessarily arise within ten years of oil and gas decommissioning: CO₂ sequestration projects can be expected to arise over a very much longer time scale. It is therefore important that any policy approach enables a break between the end of oil and gas use and the start of any CO₂ sequestration activity.

Question 11: Evidence presented to the Government to date suggests that the costs of maintaining pipelines or wells for re-use are relatively low and so financial support for this will likely not be required. Do you agree with this? Please provide evidence for your answer.

Regardless of whether costs maintaining pipelines and wells are relatively low, they are not zero, and they come with the liabilities that are associated with ownership of the asset. There is no business case for an owner to retain an asset that it does not wish to use.

We propose that assets that may be used for future CO₂ sequestration should be deactivated rather than decommissioned. De-activation is such that it is safely inert but has potential to be re-activated at some unspecified future date. The asset is retained in an essentially passive and protected state.

For a buried structure or large diameter trunk pipeline the environmental impact is the same as decommissioning, until it is accessed and surveyed for consideration in a future CO₂ project.

The aim here is that the responsible party for oil and gas decommissioning fulfils their section 29 obligations by a mix of de-activation and decommissioning assets. The on-going costs for Government or delegated authority are just the non-physical assets and core samples, and the information as to the assets that may be re-activated. They may then form part of a future CO₂ sequestration project at any future time under a UK CCUS licenced commercial activity, independently of the oil and gas asset decommissioning.

Question 12: Can you provide evidence on the increased ongoing liabilities that owners and operators may face from suspending assets for up to 10 years?

Suspending assets for up to 10 years entails costs and carries the uncertainty of unforeseen events damaging those assets. After 10 years there seems to be no value unless a future project is forced to use the assets. There is therefore a potential scope for trade-offs from the perspective of the Section 29 asset holder, the Government seeking maximum MER, and the stakeholders seeking to create a commercial CCUS project, using the option of de-activation and re-activation with no intermediate liability.

In the rare but ideal case that there is a known and present interest in an oil & gas asset being reused at the time of decommissioning, then that case can be considered as suggested in our response to question 4.

Question 13: Will plugging and abandoning wells to a standard which minimises the risks of carbon dioxide leakage in the associated field come at significant additional costs and, if so, who is best placed to bear this?

The Committee on Climate Change has made it clear that CCS is a necessity not an option for the UK. Any additional cost of plugging and abandoning wells to a higher standard should be weighed against the value to the UK of meeting its climate change targets and retaining its industries, and the opportunity cost of either not being able to use the storage site, or not being able to use it to its full capacity.

We take this opportunity to point out that CO₂ standard well abandonment should also be applied to exploration wells, where no oil and gas was found but which may be associated with suitable storage sites in saline aquifers.

Further work

SCCS recommends further work on re-use to provide evidence to BEIS on how to carry out decommissioning / deactivation in a way that maximises the benefits of the assets. We propose a series of workshops with academics and the oil and gas industry to understand reasonable alternatives to current decommissioning practice.

In addition, we propose developing a more comprehensive set of criteria to identify oil and gas assets that are suitable for re-use, and using these criteria to carry out a strategic and comprehensive assessment of the oil and gas assets of the UKCS.

Both these pieces of work would be very exportable to other oil and gas-producing countries, and would support the delivery of greenhouse gas emissions reduction in line with the ambitions of the Paris Agreement.

Scottish Carbon Capture & Storage would be happy to answer any questions or provide further information. We see merit in further articulation of the de-activation and re-activation concept bearing in mind the points above, particularly to Q4. We have a wealth of research – produced by our partner research institutions and by the SCCS team – that we would be happy to share.⁸

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⁸ See <http://www.sccs.org.uk/expertise/reports> , <http://www.sccs.org.uk/expertise/reports/working-papers> , <http://www.sccs.org.uk/expertise/publications>