Designing a Climate Compatibility Checkpoint for Future Oil and Gas Licensing

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1 Key messages

IPCC AR6 WGII[1], published 28 February 2022, tells us that climate change is already worse than expected or, more accurately, "Any further delay in concerted global action will miss a brief and rapidly closing window to secure a liveable future". This is a similar message to the IEA special analysis commissioned by the UK for CoP26[2], which tells us that existing fossil fuel discoveries are already enough to exceed the 1.5C warming limit of the atmosphere.

We welcome the opportunity to comment on a proposed climate compatibility checkpoint. This is a welcome step to recognise the huge changes in environmental and climate change pressures, which have emerged, particularly since to the adoption of a net zero by 2050 target in 2019.

In our response we try to i) identify the scope and applicability of the checkpoint; ii) identify that legal objections to continued oil production will continue; iii) explain how a method of merging hydrocarbon productions for export and carbon capture and storage (CCS) for the UK can continue to produce a new premium value hydrocarbon product with very high sustainability value.

A climate compatibility checkpoint for future oil and gas licensing must be robust and stringent, and must demonstrate that oil and gas extraction will contribute to overall emissions reduction – not just relative to the amount of fuel produced – and the only way to do this is to prevent the carbon dioxide (CO_2) emitted from the processing and use of these fuels reaching the atmosphere, using CCS.

CO_2 transport and storage needs the skills in the oil and gas industry, and now is the time to use those skills and begin permanently storing carbon below the North Sea.

Government action to continue oil and gas extraction must be accompanied by concerted efforts to reduce fossil fuel consumption across the economy – in line with the recommendations of the Climate Change Committee (CCC) – so that issues around energy security are minimised and extraction winds down in a controlled but urgent way.

[1] https://www.ipcc.ch/report/sixth-assessment-report-working-group-ii/
[2] IEA 2021. Net Zero by 2050: A Roadmap for the Global Energy Sector.

2 Aim of the consultation

We find that the consultation needs clarity in its aims. The Oil & Gas Authority (OGA) – who we assume will implement the checkpoint – has to reconcile two opposing directives from government: firstly, to maximise economic recovery; and, secondly, to contribute to reaching net zero. The consultation discusses the hurdle of climate compatibility placed onto future exploration licences, but many of the questions are directed to aspects of development and production.

If the objective is to develop a rigorous assessment to establish an enduring long-term investable policy, then both a long-term and a short-term view are needed. We suggest that the checkpoint should apply to ALL UK fossil fuel and feedstock production (gas, oil, coal, shale), both onshore and offshore. We also suggest that the checkpoint should apply to ALL hydrocarbon accumulations already discovered as well as applied to those discovered by further exploration, or by re-evaluation of already known and/or discovered accumulations.

A wide net and a wide timescale create a level playing field and acknowledges that many accumulations on and around the UK may wait for years or many decades before moving from discovery to development, or from small development to larger development.

3 Legal challenges to oil and gas production

It is now very clear that each new development of fossil carbon by the UK will face a legal challenge, whether that be Valkyrie, Abigail (consented 19 Jan, 5.5Mbbl) or Cambo (800Mbbl oil eq). Despite the Glasgow Climate Pact, there is no detectable slowing or faltering of UK government policy on hydrocarbon development, indeed Cambo would certainly have proceeded if investor partner Shell had stayed in the project. In 2022 there have been statements by multiple ministers at Westminster that the UK strongly supports a continuing oil and gas exploration and extraction industry in the North Sea.

How will the UK Government find an acceptable method to progress production of the thousands of million barrels of extractable oil assessed by the OGA to be available? As oil price increases, and CO_2 becomes more available, additional oil will become commercially recoverable: both additional oil from known reserves and the development of known but currently unachievable resources (such as the Kraken field, using CO_2-EOR).

4 Decommissioning to favour CCS

Many smaller fields will inevitably be subsea tieback or step-out from existing accumulations. A listing of future fields also shows that many are small; less than 100Mbbl oil volume. This will mean short lifetimes for boreholes and pipework. If these facilities are designed for reuse for CO_2 storage then this can greatly lower that barrier to allow abundant and diverse CO_2 storage on the UKCS. Examples of licence conditions to enable easy reuse may be:

- Archiving of a wider spread of geological data than is current practice – including temperatures and pressures and dynamic reservoir model during production
- Construction of production boreholes with CO_2-resistant materials
- Construction of production seabed pipes, or connections to risers, to be compatible with CO_2
- Abandonment of production wells to anticipate re-use, i.e. not to be conventionally plugged and cemented and capped below the seabed, but to provide a method for relocation and re-entry

5 Abating emissions – with a new hydrocarbon product

The Scope 1 and Scope 2 emissions targets in the North Sea Transition Deal should be seen as a minimum target, and be rigorously enforced.

Scope 3 is an existential challenge – how to apportion responsibility for emissions from oil and gas produced in the UK but used elsewhere?

CO_2 transport and storage facilities are now being developed in clusters of industry across the UK, commencing with Teesside and Humber, and Merseyside. This opens a route to CO_2 disposal. Can the CO_2 stored balance the fossil carbon extracted from UK below-ground resources? The tonnages involved make this possible. For example, the largest development being considered – Phase 1 of Cambo field – is 226 Mbbl oil. During a 30-year production life that is 7 Mbbl/yr, equating to 3 Mt /yr CO_2 to be stored. This is well within the scope of the UK's Net Zero Strategy's target to store 35Mt/yr CO_2 by 2035. There is plenty of geological storage available.

5.1 Carbon Takeback Obligation

The Carbon Takeback Obligation (CTBO)[3] places an obligation on fossil fuel producers to store an amount of CO_2 equivalent to that which will be emitted from the fossil fuel they extract.

A Certificate of Storage Obligation on each tonne of fossil carbon extracted from newly licensed UK fields would drive the development of authentic CO_2 capture, transport and high-quality permanent storage – certified with a Certificate of Storage. The two certificates cancel each other out, resulting in oil or methane, which has had its CO_2 already disposed of. That should add about $40 /bbl to crude oil – but this could be sold as a premium product into low-carbon supply chains. One tonne of fossil carbon extraction is balanced by 1 tonne of fossil carbon injection[4]. Our simulations show that the CTBO can be applied throughout an entire economy at less cost than the presently projected system of taxes and carbon prices[5]. The

[3] Kuijper, M. *Carbon Takeback Obligation: A Producers Responsibility Scheme on the Way to a Climate Neutral Energy System*. https://www.gemeynt.nl/bericht/carbon-takeback-obligation-a-producers-responsibility-scheme-on-the-way-to-a-climate-neutral-energy-system (2021).
[4] Allen, M. R., Frame, D. J. & Mason, C. F. The case for mandatory sequestration. *Nat. Geosci.* **2**, 813–814 (2009).
[5] Jenkins, S., Mitchell-Larson, E., Ives, M. C., Haszeldine, S. & Allen, M. Upstream decarbonization through a carbon takeback obligation: An affordable backstop climate policy. *Joule* **5**, 2777–2796 (2021).

CTBO can also work alongside the UK-ETS by cancelling carbon allowances rather than paying for pollution permits.

Thus, a new product of decarbonised oil is created. The developer pays the provider of CCS – who has to acquire CO_2 for storage, emplace the CO_2 securely and take liability for its secure retention.

5.2 Sources of carbon, relieving a Treasury problem

Initial development of CCS in the UK will be supported by the UK state (HM Treasury) through emerging business models. The CTBO offers a route where extractors of UK hydrocarbons pay for a tonnage of carbon storage equivalent to the fossil carbon they extract. The exact molecules of CO_2 will be different – the CO_2 that is stored does not have to be captured from the fossil fuel produced by the developer – but the Certificate of Storage, purchased from a transport and storage provider, cancels the newly extracted fossil carbon. This can provide a market pull to develop direct air capture (DAC)[6] and can provide a buyer for certificates of CO_2 captured by industrial actors. Both of these could avoid the build-up of multi-billion-pound subsidy payments from HM Treasury.

What if these CTBO systems are not adopted? It is clear that the current problem of public and environmental perception will become much worse, and opposition to any further oil and gas extraction will grow. Although there is no official UK listing of fields under appraisal for development consent, a listing has been published by Uplift, derived from oil consultants Rystad Energy. That lists 46 different projects, the two largest being Clair South (401 Mbbl in place) and Rosebank (438 Mbbl in place), with the others each comprising tens of Mbbl oil, totalling 2.7 Bn bbl oil eq. If it is all produced, that is 1,080Mt CO_2, or 36 Mt /yr CO_2 if each projects lasts 30 years. Again, it is well within the ability of UK CO_2 storage to store this annual amount.

6 EU carbon border adjustment

The government should also be aware that, if continued extraction of unabated oil and gas continues, this will eventually fail at the EU border, where Carbon Border Tax adjustments are on their pathway to emergence[7] [8] following the detailed classification of carbon limits in all sectors through the EU sustainable taxonomy. Clinging to high-carbon raw materials rather than producing low-carbon feedstocks and materials will rapidly be subject to punitive tariff barriers. The UK should be leading on the inside of such a regime rather than catching up on the outside. Actively linking the transition from high-carbon activities to creating low-carbon alternatives, using the same skilled workforce, provides a pathway to a more sustainable and renewable future.

[6] Haszeldine, R. S., Flude, S., Johnson, G. & Scott, V. Negative emissions technologies and carbon capture and storage to achieve the Paris Agreement commitments. *Philos. Trans. R. Soc. Math. Phys. Eng. Sci.* **376**, 20160447 (2018)
[7] https://www.bcg.com/publications/2021/eu-carbon-border-tax
[8] https://ec.europa.eu/taxation_customs/green-taxation-0/carbon-border-adjustment-mechanism_en

7 Comments on Government's proposals

7.1 Principles of the Checkpoint

The consultation proposes three principles for the checkpoint: that it be evidence-based, transparent and simple.

There must also be a fourth principle: net-zero aligned. The checkpoint must deliver outcomes that align with the goals of the Paris Agreement and the UK's 2050 net zero target.

Although simplicity is desirable in decision making, the checkpoint must be robust, and take into account the full environmental costs and benefits of fossil fuel extraction.

7.2 Proposed Checkpoint Tests

7.2.1 Reductions in operational greenhouse gas emissions from the sector vs commitments

This test is very weak, and we do not support it.

We are very disturbed by the "pro" given for this test in the consultation document, that it "provides a motivation for the sector to make good on its commitments". If the oil and gas sector is not expected to make good on its commitments under the North Sea Transition Deal, then why did the government agree the deal – and the accompanying funding – with the sector?

As it is, the North Sea Transition Deal is less ambitious than the CCC's recommendations, so there should be no grace margin for the sector should it fail to meet its targets.

The consultation document suggests that failure to meet the targets could be due to circumstances outside the industry's control. This may be the case but it is not an argument for allowing further exploration – indeed, if emissions from the industry are not reducing, then the industry's licence to operate should be called into question.

The example given of a circumstance outside the industry's control is "progress on removing regulatory barriers". This would be entirely within the government's control so, if it is essential or important for decarbonisation, it should be prioritised by the government to allow the test to be passed.

7.2.2 Reductions in operational greenhouse gas emissions from the sector benchmarked internationally.

Further motivation to the sector to invest in decarbonisation could come from including fossil fuels in a UK carbon border adjustment mechanism and setting stretching targets to reduce production emissions in line with net zero targets.

7.2.3 Status of the UK as a net importer or exporter of oil and gas

This needs to be used in line with efforts to reduce production emissions through international benchmarking.

It must also be conditional on Government taking noticeable action to rapidly and greatly reduce fossil fuel consumption across the UK economy, as set out by the CCC.

7.2.4 Sector progress in supporting Energy Transition technologies

Energy transition technologies are crucial to reaching net zero. Oil and gas production can only continue if CCS is available to prevent the CO_2 from the use of fossil fuels reaching the atmosphere, and to allow greenhouse gas removals to compensate for residual emissions.

Therefore, this test should be adapted so that new oil and gas licences can only be granted if CO_2 transport and storage is available and operational in the UK, and have the capacity to store the emissions associated with the oil and gas to be produced.

The CTBO can be used to drive sector progress in supporting energy transition technologies.

7.2.5 Consideration of international Scope 3 emissions

Scope 3 emissions can be estimated from the amount of oil and gas produced. This would be the basis on which CTBO is calculated.

7.2.6 Consideration of the 'global production gap'

If Government wishes to retain the support of the public for its support of the oil and gas industry, it must demonstrate strongly that it takes climate research seriously and make efforts to include the global production gap in the climate checkpoint. This test has clearly been given much less thought and consideration than the others proposed, and question 20 – asking for a proposed methodology for this test – is very different to the questions about tests 1-4, which ask for suggested adaptations.

8 Scottish Carbon Capture & Storage

Scottish Carbon Capture & Storage (SCCS) is the largest CCS research group in the UK, providing a single point of coordination for CCS research, from capture engineering and geoscience to social perceptions and environmental impact through to law and petroleum economics.

Our internationally renowned researchers provide connected strength across the full CCS chain. With our unique position SCCS is able to act as the conduit between academia, industry and government.

SCCS has access to cutting-edge experimental and analytical facilities, expertise in field studies, modelling and simulation, key academic and research personnel to accelerate the

development of CO_2 transportation, capture and subsurface storage. We undertake strategic fundamental research and are also available for consultancy. In addition, we perform a key role in providing impartial advice to industry, the public sector, government agencies, and policy makers.

Founded in 2005, SCCS is a partnership of the British Geological Survey, Heriot-Watt University, the University of Aberdeen, the University of Edinburgh, the University of Glasgow and the University of Strathclyde working together with universities across Scotland.

This submission does not necessarily represent the views of the individual members of the SCCS Directorate nor of the SCCS consortium partner institutes.