BUSINESS MODELS FOR ENGINEERED GREENHOUSE GAS REMOVALS JULY 2022

UKPIA RESPONSE

Section 1: Rationale for developing business models for GGRs

1: Do you agree that the Government should develop a GGR business model to enable a diverse portfolio of GGR technologies to deploy at scale in the next decade?

UKPIA agrees that the Government should develop a GGR Business Model which enables a diverse portfolio of GGR technologies to deploy at scale.

The existing market arrangements will not provide sufficient confidence in a return on investment in GGR technology at scale, recognising the high capital and operating costs associated with this activity.

2: To support a portfolio approach to GGR deployment, do you agree that Government policy for incentivising negative emissions should be technology-neutral as far as possible?

UKPIA agrees that Government policy for incentivising negative emissions should be technology neutral.

Government policy on GGR should incentivise the resulting Greenhouse Gas (GHG) removals themselves, rather than the technology pathway concerned.

This will ensure that emerging GGR technologies are developed at scale to remove GHGs in the most effective manner and at the lowest possible costs.

Section 2: A contract-based business model for negative emissions

3: Do you agree with the Government's principles for policy design?

UKPIA agrees that the principles identified all look reasonable and sound.

The immediate principles that need to be met lend themselves towards supply side incentives. These include revenue certainty, a defined short term GGR target and the development of lowest cost and highest impact projects. This is consistent with our response to Q2 above.

The longer-term principles, based around achieving a sustainable position, whereby the market incentivises investment are also sound.

The approach of short- and longer-term principles implies a transition from one to the other over time. Due to the nature of the emerging technology and the uncertain pathway that this creates, this may be difficult to manage in practice and further consideration on this may be required.

4: Do you agree with our overall approach to introduce a contract-based business model for GGRs to provide revenue support for negative emissions?

UKPIA agrees with the overall approach for the introduction of a contract-based model for GGRs, for the reasons given in the consultation.

This would be the only mechanism where a scheme can be established that provides investors with a secure return on investment, as well as the ongoing costs of operation.

5: What is your preferred contract scheme of those outlined in the consultation? Please provide arguments to support your view.

UKPIA suggests that the Contracts for Difference (CfD) model may be the best approach and is consistent with the approach taken in other sectors such as Renewable Electricity [1]. This scheme aligns with the Government's aims for the market to manage risk, while providing a secure return on investment to investors. As has been proven in other sectors, it also provides a transition route to long term development of the sector.

However, we also recognise the comments that the direct application of a CfD scheme that has worked in other industries may not necessarily be appropriate for the GGR sector. We would therefore urge that the unique complexities of GGR technologies be considered and the CfD scheme be updated the reflect this (while maintaining the general principles of a CfD scheme).

Of particular note is the statement in the consultation that if the reference price is greater than the strike price then "the difference is paid to the counterparty by the provider". This would seem to be counter to the principles of other CfD schemes, where the provider would be able to take advantage of the higher reference price (as also outlined in the Negative Emissions Guarantee scheme)

The Negative Emissions Payment scheme presented in the consultation appears to require the Government to be active in the market rather than the provider. This would be a significant market intervention on the part of the Government, and different to the approach taken in other sectors. This intervention does not seem to have sufficient justification for the GGR sector when other approaches have been proven to be successful in other sectors.

The Negative Emissions Guarantee would be the best approach from an investor perspective by providing a guaranteed return on investment but also allowing providers to take entrepreneurial advantage of the market. However, this guaranteed investment may also stifle competition and the development of the market whilst maximising cost to the Government.

[1] https://www.gov.uk/government/news/government-hits-accelerator-on-low-cost-renewable-power

6: When might it be feasible to introduce an auction mechanism for GGR contracts, and what criteria should the Government consider when developing its allocation process?

UKPIA suggests that the normal criteria for the Government to consider in the development of its allocation process would be:

- Capex required per tonne of CO_2 recovered.
- The Efficiency of GHG capture
- The ongoing operating costs per tonnes of CO2 recovered
- The credibility of the bid, including for example the accuracy of the estimates provided
- The technology risk involved (in other words whether the GHG technology is commercially proven, or whether there is a technology / FOAK risk)
- The commercial risk associated with the project including the financial history and status of the proposer(s)
- The credibility of the proposer(s) to implement the project – for example experience and capability of key staff members
- The societal benefits of the project, including for example the benefits to the local economy and employment.

UKPA recognises that these criteria tend to favour large projects providing economies of scale, using established technologies and that are executed by large, well-established organisations.

In order for there to be a level playing field, and to incentivise more novel technologies and companies, a two-tier auction process could be used, with a cut-off based around the size, scale, and technology risk of the projects.

Finally, another approach to this could be for large projects to enter into bilateral negotiations with large projects and for the auction process to be utilised for smaller projects, or those with less established technology (with different and more flexibility criteria for selection recognising the greater risk). This would also optimise the potential demand on Government negotiation resource, and is consistent with the approach we have suggested in other sectors such as Electrolytic Hydrogen [2].

7: How can the Government most effectively reward innovation and cost reduction in early GGR contracts?

UKPIA suggests that, as with any sector, prudent companies are likely to invest in the level of equipment they require in order to effectively manage their operations (e.g., recover achieve the level of GGRs that they expect based on the equipment design). Similarly, companies are likely to invest in the best equipment available at the time of installation.

[2] https://www.ukpia.com/media/2843/ukpia-response-market-engagement-on-electrolytic-allocation-consultation.pdf

In the longer term, if as planned, Government support declines and the commercial performance of the equipment is reliant upon market factors, then the ongoing commercial viability of the equipment will be dependent on its operating and maintenance costs.

In addition to the factors outlined in our response to Q6, they key to successful Government investment is to prevent producers incorporating unrelated Capex scope into the project (for example obtaining Government funding for non GGR related spend)

8: If the Government pursues a Negative Emissions Contract for Difference, what is the most appropriate basis for setting the reference price for initial contracts? Please provide arguments to support your view.

UKPIA suggests that prudent companies will invest in commercial projects based around a specific hurdle rate [3]. These companies will therefore initially require a reference price to be set in order for the project to achieve this hurdle rate in order for the project to proceed. The hurdle rate will vary from company to company, based on their financial status and economic outlook. This hurdle rate would apply until the project Capex is paid off.

Once the Capex is paid off, an alternative arrangement can be established, for example a cost-plus type of arrangement or as a percentage of capital employed.

In summary, most prudent companies would invest based on specific economic principles (which may vary from company to company) and would look for these principles to be met via the agreed reference price. As we outlined in our response to Q6, bilateral negotiations would seem to be the most pragmatic approach for larger projects which can offer the most significant GGRs.

9: What mechanism could the Government introduce to ensure that project developers achieve the highest possible sales price for negative emissions credits on the market?

UKPIA is unable to answer this question in detail, given the lack of available information on how the market will operate.

However, we would encourage the Government to intervene in the market as little as possible to prevent unintended consequences and the risks of both picking project winners while over-incentivising the market.

10: What do you think is the most appropriate option for setting the length of GGR contracts? Please explain your rationale.

Please see our response to Q8.

[3] https://study.com/academy/lesson/what-is-a-hurdle-rate-definition-formula.html

Prudent companies will have their own hurdle rates on which to invest until the project Capex is paid off, and these will vary from company to company.

Bilateral negotiations including both the reference price and length of contract in order for the project to achieve the required minimum hurdle rate would therefore seem to be the most appropriate way forward.

11: Would it be desirable to include a review mechanism in early GGR contracts? If no, please outline your reasons. If yes, please give your views on how a review mechanism might be designed.

UKPIA suggests that a review mechanism should be included in early GGR contracts

This should be a time-based review mechanism, with the review considering pre-agreed Key Performance Indicators (KPIs) [4]and other performance metrics. The outcome of the review and any required changes to the contract would then be based on the project performance against the metrics.

The list of KPIs and other performance metrics would be agreed as part of the bilateral negotiations as well as the timing of the review(s) once the project had commenced.

12: Should the Government allow project developers to combine negative emissions support under a GGR business model with other support mechanisms for co-products? Please provide arguments to support your view on whether this could be an effective route to supporting multi-product GGR projects.

UKPIA supports the incentivisation of projects where the CO2 is captured in a permanent and irretrievable manner. "Usage" should not, for example, include single use, such as carbonating soft drinks. Equally, the use of CO_2 captured by GGR for use in RFNBOs or e-Fuels in which the carbon element is then later re-emitted should not be supported under the GGR removal scheme; support for these could for example be provided under the Renewable Transport Fuels Obligation (RTFO) or Sustainable Aviation Fuel (SAF) mandate.

Providing that permanent capture is provided, then UKPIA believes that allowing developers to combine negative emissions support with other support mechanisms for co-products should be allowed. This allows a different funding mechanism to be provided, potentially minimising Government compensation under the GGR scheme. It should be discussed as part of the bilateral negotiations suggested in our response to Qs 8 and 10.

[4] https://www.qlik.com/us/kpi

13: Do you believe that capital support instruments are necessary to complement GGR business models? If so, please outline your reasons and your preferred type of capex support mechanism.

UKPIA believes that financial support for the project and technology development phases of GGR projects would be advantageous to supplement the costs of the final build phase.

Project development costs prior to the final investment decisions may approach 10% of the total project cost, which for the scale of projects being considered may also be substantial in nature.

This would be especially true for emerging technologies where small-scale pilot plant / demonstration plants may be required to gain confidence in the technology.

Grant funding for this phase may be the most straightforward mechanism and the most appropriate for supporting the project development stages of an established technology. Grant funding earlier in the project can also be considered in any Government business model support for the remainder of the project.

Loans or equity funding may be of interest of the pilot plant process or demonstration unit support. Again, these can also be considered in any Government business model support for the remainder of the project.

14: What other issues should the Government consider when progressing work on the design of a GGR business model? Please focus your response on issues that are not directly considered through this consultation.

Energy Intensive Industries (EIIs) such as refining based in the UK are often significant emitters of carbon and face significant international competition. As we outlined in our response to the March 2022 consultation on the development of the UK ETS[5], such businesses incur an inherent risk of carbon leakage should the costs of CO2 mitigation they face making their businesses uncompetitive.

UKPIA notes that the GGR consultation does not mention this risk and strongly suggests that it is fundamental to the design of GGR business models.

In order to protect UK resilience in key industries, GGR business models must not impose an excessive unilateral financial burden on UK EIIs. A failure to properly take these risks into consideration risks both significant carbon leakage and a potential failure of the GGR business models.

[5] https://www.gov.uk/government/consultations/developing-the-uk-emissions-trading-scheme-uk-ets

Section 3: Building a market for negative emissions

15: What do you believe is the most appropriate market framework for supporting initial GGR projects over the next decade, and how might this framework evolve over time? In your answer, please consider the market options outlined in Section 3, indicating which option or combination of options would be preferable to achieve our objectives.

UKPIA believes that in order to create a level playing field, a compliance market is the most appropriate market framework to adopt.

The UK has had an Emissions Trading Scheme (ETS) for a number of years. The UK ETS scheme was established following the UK's withdrawal from the European Union but remains a well understood mechanism for the reduction of UK GHG emissions and providing a single compliance market for carbon.

We strongly believe that negative emissions derived from GGRs should be included in the UK ETS, allowing emitters to choose the most cost-effective option to meet their obligations under the scheme.

UKPIA does not support the creation of an additional GGR obligation scheme. As we outlined in our response to Q14, large scale UK emitters often face significant international competition, and the addition of unliteral financial obligations of this nature is a significant risk to the financial viability of these operations; this has the potential to lead to both carbon leakage and the failure of the GGR business models.

Voluntary schemes may operate for some business but as outlined in the consultation currently have limited regulation, risking both the reputation of the GGR schemes and the businesses concerned (including the risk of "greenwashing"). Due to the nature of the international competition discussed in our response to Q14, interest in voluntary schemes may be of limited interest to UK based EIIs.

16: What steps should the Government take to stimulate voluntary corporate demand for negative emissions credits?

As discussed in our response to Q15, UKPIA supports a compliance market based on the UK ETS for GGRs and does not believe that a voluntary scheme is appropriate.

17: To maximise voluntary private investment in negative emissions credits, would it be preferable for the Government to (i) establish a regulated market for engineered GGRs or (ii) directly endorse voluntary carbon market bodies that meet high integrity and verification standards? Please outline your view of the main benefits and challenges of each approach.

As discussed in our response to Q15, UKPIA supports a compliance market based on the UK ETS for GGRs and does not believe that a voluntary scheme is appropriate.

18: Would it be desirable for the Government to establish a regulated market for engineered GGRs to allow for future integration with the UK ETS and/or provide the foundation for a GGR obligation scheme? If so, how could this be achieved?

As discussed in our response to Q15, UKPIA believes that it is desirable for the Government to establish a regulated market for GGRs and integration with the UK ETS is vital as it creates a single compliance market for carbon.

One approach for the Government to consider is to create an "administrator" for GGRs, which operates under BEIS. This approach has operated very well under the RTFO[6] for many years, with obligated suppliers submitting information to the Department of Transport Low Carbon Fuels Unit (the "administrator" on the volume as well as the carbon and sustainability performance of the renewable fuels that they supply. Once the information has been verified by an independent auditor and has satisfied the appropriate criteria then Renewable Transport Fuels Certificates (RTFCs) are issued to the obligated supplier. This is effectively a form of Monitoring, Reporting and Verification, (MRV). RTFCs can also be revoked should an issue emerge with the supplier's information once it has been provided, providing assurance against fraudulent activity. These RTFCs can then be traded amongst suppliers and ultimately redeemed by obligated suppliers. A similar approach is being proposed under the Sustainable Aviation Fuel (SAF) mandate scheme.

This approach provides a robust and transparent mechanism for the creation of negative emission credits which can then be used by emitters against their UK ETS commitments. It provides an income stream for GGR operators, who can sell their credits to the emitters.

Section 4: Accounting and sustainability frameworks

19: Do you agree with the government's immediate priority for MRV, including a review of standards that could underpin business model support for initial GGR projects? Please share any views or suggestions that could help to inform our approach.

UKPIA agrees with the consultation proposal for the Government's immediate priority for MRV including the review of standards. The use of standards, particularly those of an international nature, provides a level playing field for scheme participants in which to operate.

Government should set a list of required criteria under which GGR schemes should operate. The standards proposed can then be compared with these criteria to determine whether they comply, and deficient schemes rejected when claiming GGR compliance. Alternatively, the standard owners can update their standards to align with the Government requirements, allowing future GGR compliance to be claimed.

[6] https://www.gov.uk/government/publications/renewable-transport-fuel-obligation-rtfo-compliance-reporting-and-verification

This approach mirrors that taken in the early years of the RTFO, where schemes were compared against the RTFO criteria and with some being updated to reflect the UK requirements. For example, currently compliance with the International Sustainability and Carbon Certification (ISCC) scheme for carbon and sustainability performance is acceptable to the RTFO administrator when claiming RTFCs.

20: Beyond ensuring the legitimacy of initial projects, what is the appropriate role for the government in developing a robust and enduring framework for negative emissions MRV, compared to the role of other bodies such as those outlined in Figure 1?

The Government administrator would need to be involved on an ongoing basis in developing and maintaining a robust and enduring framework for negative emissions MRV. This ensures an independent view as the knowledge base for GGRs develops and creates a level playing field while ensuring the integrity of the scheme.

This is the approach taken under the RTFO, where the administrator continually reviews the standards against the Government requirements. Standards can change over time, and new standards may evolve that can be included. Equally standards may no longer comply with Government requirements and may therefore have to be rejected when claiming RTFCs.

21: Do you agree with our proposed principles for negative emissions legitimacy?

UKPIA agrees with the proposed principles for negative emissions legitimacy.

However, these should be reviewed periodically to ensure that the principles remain fit for purpose as the GGR knowledge base develops.

Section 5: Applicability across different GGR technologies

22: Are there specific policy requirements for initial DACCS projects that the Government should take into consideration? Please provide arguments to support your view.

UKPIA is unable to respond to this question due to limited knowledge in this area at this time.

23: Do you have views on the applicability of the GGR business model to BECCS projects that are not eligible for the Industrial Carbon Capture or Power BECCS business models?

UKPIA is unable to respond to this question due to limited knowledge in this area at this time.

24: Do you have views on the applicability of the GGR business model to novel technologies excluding DACCS and BECCS? Please outline any specific policy requirements or other considerations we should take into account.

UKPIA is unable to respond to this question due to limited knowledge in this area at this time.