REA Members Briefing – BEIS publish consultation Business Model for Power BECCS

BEIS have published a consultation seeking views on proposals for a business model to incentivise deployment of First of a Kind (FOAK) power bioenergy and carbon capture and storage (BECCS) within the UK, as previously committed to the Biomass Policy Statement (2021).

The consultation concerns the deployment of power BECCS plants **only** and does not relate to other forms of Greenhouse Gas Removal (GGR) or BECCS technologies, to whom the GGR business models consultation may apply.

Below the REA provide a briefing of each section of the consultation.

Section 1: Rationale for developing a power BECCS business model

This section sets out the background to the consultation, providing a strategic case for power BECCS focused on the value the technology can provide to energy security and progress towards net zero.

BEIS analysis at the time of the Net Zero Strategy showed that GGR technologies are expected to deploy up to 5Mt CO_2/year by 2030; 23 Mt CO_2/year by 2035 and between 75 and 81 Mt CO_2/year by 2050, with higher and lower deployment possible depending on sector-specific and wider economy developments.

BEIS note that a specific Power BECCS business model is required to ensure correct behaviours are incentivised, both in relation to the grid, and to the wider societal benefit of negative emissions. They add that market-based investment in power BECCS is hindered by a variety of operational and economic challenges common to bioenergy and CCS technology.

This section asks broad questions in terms of the market barriers to the deployment of power BECCS projects.

Section 2: Potential business models

This section outlines the government's intention to introduce a contract-based business model for power BECCS, subject to affordability. The model aims to address the main investment barriers by providing revenue support for both power generation and negative emissions, within a recognised contract framework that manages the cross-chain risk posed by interactions with the transport and storage (T&S) network.

BEIS sets out a few CfD based approaches, but primarily focuses on the Governments minded-to-position to create a "CfDc + CfDe" model. This would see a combination of CfD for electricity generation (£/MWh) and a CfD for Carbon (£/tCO2), set as a dual payment mechanism under one CfD contract framework.

CfDe and CfDc Mechanism design

BEIS note the following in terms of the design of the mechanisms:

- BEIS identify a range of options for helping to determine a strike price for the CfDe component of the model:
    - Wholesale price projections:
    - Cost of unabated biomass generation:
    - Comparator technology cost
- In considering the CFDc strike price they reference the costs associated with adding carbon capture and storage capability and operating the plant on an abated basis. This could include: Capex and financing costs associated with CCS equipment, fixed costs associated with CCS equipment maintenance, additional fuel cost associated with generation with CCS.
- Contract lengths are proposed to last 10-15 years.
- BEIS are consulting on how to factor in the following areas:
    - Biomass feedstock costs
    - Transport and Storage Charges
    - Relief for Transport an Storage outages

Rationale for CfD mechanisms

Their minded-to position is based upon a report published to analyse potential commercial frameworks. They outline the following benefits of the proposed model:

- This option is the most flexible and allows revenue from any appropriate carbon market;
- The flexibility to adapt to the inclusion of the project within a future carbon market for negative emissions can reduce the scale of support payments;
- By providing a revenue guarantee (where the subsidy payment is linked to the market price and increases or decreases in line with market prices) for both carbon and electricity, the business model minimises investor risk and should reduce the cost of capital as well as mitigate the potential for over-compensation;
- The presence of the CfDe is important for incentivising desired performance around generation when the T&S network is unavailable;
- A key principle of the business model is to value both the electricity output and the negative emissions. The dual mechanism values low carbon power and negative emissions separately, allowing separate cost distribution of these value streams (further consideration of the proportion of payment across both parts needs to be considered);
- A CfDe + CfDc allows them to set a strike price and a pay-back mechanism on both sides of the mechanism; and
- BEIS are still considering the reference price for the CfDc and how it could vary according to whether the project could participate in the UK ETS or another appropriate carbon markets.

- A CfDc alone without CfDe would make the CfDc costs far higher per £/t CO_2 to cover the proposed fuel costs.
- A CfDc alone may not provide an incentive for the plant to run unabated and generate electricity during periods of T&S outage and would not enable any pay-back mechanism during periods of high-power price.

Section 3: Sustainability and negative emissions

BEIS note that power BECCS must result in an overall net-negative removal of CO2 from the atmosphere and must only use sustainable biomass.

Their minded to position is to continue to set a maximum threshold, at least, for power BECCS supply chain emissions to ensure that power BECCS results in a minimum level of net-negativity. The details of the supply chain thresholds will be determined in part using evidence from the consultation.

BEIS do state an intention to strengthen the existing sustainability criteria for biomass where possible and take this opportunity to increase the GHG emission mitigation potential of biomass use.

They outline three options for the final unit of measurement for the supply chain GHG threshold. In all options, the threshold would be set so that overall, there is a minimum net-negativity from the power BECCS project:

1) *Electricity basis*: this option applies a conventional GHG threshold on the biomass-generated electricity, as is done currently.
2) *Carbon basis:* This option sets a GHG threshold on the stored carbon, which will be based on a per unit basis (e.g., gCO_2/tonne of CO_2 stored). This could be assessed to the point at which the CO_2 enters the T&S network.
3) *Combined option*: This option combines the two outlined above. It would set a single combined limit on the supply chain emissions per unit of electrical output which considers the stored biogenic carbon (i.e., a negative supply chain threshold in gCO_2/MJ electricity). This means that the project will have to meet a supply chain emissions threshold that could be affected by both the electrical conversion efficiency and carbon capture efficiency.

Finally, BEIS are consulting on whether to reward a power BECCS facility on a 'net' or 'gross' basis. This means either rewarding the total volume of carbon stored after the net-negative threshold is met OR rewarding each unit of permanently stored negative carbon, discounting the stored carbon deemed to be above the set net-negativity threshold.