REA Consultation Response: Power BECCS Business Model

The Association for Renewable Energy & Clean Technology (REA) is pleased to submit this response to the above consultation. The REA represents a wide variety of organisations, including generators, project developers, fuel and power suppliers, investors, equipment producers and service providers. Members range in size from major multinationals to sole traders. There are over 500 corporate members of the REA, making it the largest renewable energy trade association in the UK.

Of further relevance to this consultation, the REA represents the largest group of Biomass Power operators in the UK through its member forum, Biomass UK. This includes the majority of biomass companies in the county, across a range of sizes, and utilising a range of biomass feedstocks including domestic and imported biomass pellets, waste wood and energy crops like straw. In addition, we also have members involved in biomass heat, energy from waste, green gasses, advanced conversion technologies, hydrogen and renewable transport fuels –who, while not directly relevant to Power BECCS, shall also be looking at broader carbon capture business models.

Section 1: Rationale for developing a power BECCS business model

1. **Have we identified the most important challenges in considering the development of power BECCS projects?**

Yes, the REA broadly agree with the challenges identified within the consultation, however, in addition, we would also raise the following points listed below. While these are challenges, it is also important to stress that they also represent significant opportunities in terms of not only delivering critical negative emissions but also contributing to energy security and ensuring affordable energy bills.

Further challenges, barriers, and Opportunities:

- Changes to how the wholesale market operates, resulting from the Review of Energy Market Arrangements (REMA) process, will impact how power BECCS projects are rewarded for the power that they generate. While we are supportive of seeing wholesale market reforms, and decoupling the marginal price of generation, any reforms must be carefully considered as they will impact the revenue streams of both existing biomass assets and the development of future power BECCS projects. The development of the Power BECCS Business model must, therefore, be done in parallel, and with consideration of, the REMA process.

- While the consultation recognises the potential for the retrofitting of BECCS systems on existing biomass infrastructure, the consultation does not consider the need to support BECCS developments at different scales. It is important that the Power BECCS model can support all sizes of projects. There is already industry concern that within the current power BECCS cluster sequencing allocation round, the eligibility criteria have excluded projects below 100 MW. This has immediately excluded ~1.3GW of operational biomass power plants with the potential to provide ~8.3Mtpa of carbon removals from participating. The development of the Power BECCS Business Model must make clear how it intends to support projects at different scales.

- The consultation recognises that carbon removal markets are fairly nascent. However, within the description, it fails to analyse the work already well underway within many of the voluntary carbon markets to develop negative emission standards and MRV protocols. The design of the Power BECCS Business Model should recognise the potential role that both obligated and voluntary carbon markets will have in the future in supporting project development and how projects may be able to take advantage of both. The GGR Business model explores this in greater detail, but this must be also considered in the design of the Power BECCS model.

- Broader infrastructure challenges should also not be forgotten. While the infrastructure development of transport and storage is recognised, the consultation does not mention the constraints currently seen on the transmission and distribution electricity grid systems, in some cases resulting in 8-year lead times to get a grid connection. Given the role of Power BECCS to both produce electricity and capture carbon, constraints pertaining to abilities to export electricity to the grid, currently affecting all generation projects and slowing the development of new ones, must also be considered.

- Interactions with the existing support mechanisms and a new Power BECCS Business Model should also be made clear. Existing biomass infrastructure is largely built out under the Renewable Obligation, with contracts starting to come to an end in 2027, but with many going into the 2030s. There are also projects with existing power CfDs in place and some biomass CHP sites may be supported under the Non-Domestic Renewable Heat Incentive. What is more, we are aware that Government is also in the process of considering voluntary CfDs for existing RO generation, as an immediate response to wholesale market prices. Developers and financiers will want reassurance that existing revenue streams and contracts will be honoured for their original contract length, or that appropriate arrangements made before they consider new investments in retrofitting CCS through this new model.

2**. Are there any other market barriers in addition to those identified?**

The main market barriers are identified within the consultation; however, we also refer BEIS to the challenges, and subsequent barriers, we raise in response to question 1.

3. Are there any other power BECCS-specific risks that need to be considered? If so, what are your proposals for mitigating them?

Government must continue to show strong support for biomass power generation, recognising the role it has to play in helping to decarbonise our power systems and complement the deployment of other variable renewable technologies by providing firm generation. Power BECCS has a crucial role to play in the delivery of net zero, however, biomass power itself must continue to be seen as viable given the benefits it provides to the grid and in decarbonisation. As such, existing biomass infrastructure that is unable to retrofit CCS should still be seen as valuable, even after they come to the end of their existing generation contract arrangements. The Government's Biomass Strategy should make clear its ongoing support for biomass generation.

It should also be noted that there could be specific challenges relating to different biomass supply chains be they imported, produced domestically or virgin, waste wood or energy crop. Such variation should be kept in mind, and the policy design solely is based on imported virgin pellets, even though this remains a crucial feedstock and backbone for BECCS.

Section 2: The business model proposal and options considered

4. Do you agree with the overarching objectives of our policy framework for power BECCS?

The identified objectives and criteria are sound, however, we would raise these additional objectives and considerations:

- While appropriate to prioritise affordability and minimise cost, this ambition must be balanced against the need to see a nascent industry commercialised and for continued innovation to take place to realise higher capture rates, greater efficiencies, lower OPEX costs and minimise space requirements, amongst other criteria. The cheapest technologies today, may not lead to the best longer-term solutions. This is well demonstrated in the Government's recent commissioned review of Next Generation Carbon Capture Technologies [1], where a levelised Cost of Capture is used to ensure a balance between low cost and the benefits delivered. Continuing to recognise a levilised cost should be an ongoing objective of the Power BECCS Business Model.

- There should be an explicit objective to see the business model be applied to multiple scales of project, as well as supporting both the retrofit and new build of sites. There is a significant volume of existing biomass infrastructure that risks being excluded from support if eligibility criteria, as seen in the most recent Power BECCS cluster sequencing phase, are maintained.

- The objective should also make clear the longer-term aim of ensuring the development of a responsive and transparent negative emissions market, both in the voluntary and obligated carbon markets, so that the Power BECCS Sector, along with other GGR technologies, can move away from direct government support.

- We would also encourage the inclusion of the objective of realising high-quality, government-accredited, negative emissions. The development of this nascent sector must also be accompanied by the development of strong transparent standards that properly demonstrates the value of the negative emissions realised. This is crucial to also build public confidence in the technology. While strong steps are now being made to develop standards within voluntary carbon markets, a separate Government accredited standard, building on the work done elsewhere, must accompany the carbon capture Business Models to provide additional robustness and confidence in the standard.

[1] BEIS (2022) Review of next-generation carbon capture technology for industrial, waste and power sector, https://www.gov.uk/government/publications/review-of-next-generation-carbon-capture-technology-for-industrial-waste-and-power-sectors

5. Do you agree with the minded-to position of a combined CfD for electricity generation (£/MWh) and a CfD for Carbon (£/tCO_2) under a CfD contract framework? If not, please provide rationale for why not?

Feedback from REA members suggests that the minded to position of a 'CfDe + CfDc' mechanism could be made to work and, with further information regarding the design, in particular on the setting of the strike and reference prices, could be investable. However, we would also stress that, in the short term, we do not consider it the best mechanism for price discovery for negative emissions or providing optimal early confidence to investors.

As stated in our response to the original GGR Call for Evidence, the preference remains to see the application of a Negative Emission Payment accompanied with a CfDe. Delivering a CfDc is going to be difficult given the lack of available data on which to model reference prices and predict revenues within the scheme, making early projects hard to finance. A dedicated NEP, for the first few projects, would help resolve this issue as well as provide a strong basis for further price discovery, against which a well-priced CfDc + CfDe scheme could then be delivered.

It is noted that a possible way to realise the same advantages of the NEP within the CfDc would be to ensure early projects are compensated at full sales cost, with a return on investment, effectively setting a reference price of zero. This, therefore, provides a straight basis for predicting payments up to the strike price. This could then be reviewed for new contracts once the negative emissions market is established and there is a clear pricing basis for the reference price. It is recognised that if this is done, Government will want some mechanism to allow for existing contract strike prices to be reviewed once a market price is better established. This must be very carefully designed and be fully predictable and transparent, as any suggestion of a review raises a significant level of risk for developers and financiers.

Finally, we strongly support design principles of separate payments for the electricity and negative emissions. Equally, we also support the focus and consideration of enabling flexibility to integrate negative emissions sales from both voluntary and obligated carbon markets. This is a valuable longer-term aim and why we recognise that a CfDe+CfDc arrangement can work well in the long term.

6. Should the power BECCS project be incentivised to run as baseload or flexibly? Please provide rationale for your answer.

Power BECCS projects should be incentivised based on baseload as this will drive the most predictable and largest volume of negative emissions. However, sites should also be able to operate within the wider flexibility market, being rewarded through the market for services being provided to the grid.

In this arrangement, the primary focus remains on negative emission production, but operators are provided with the commercial opportunity to seek further returns through flexibility services, even if not directly incentivised to do so.

7. Are there any alternative methods to setting this that should be considered?

There should be a continued level of consistency between existing power CfD arrangements and a new CfDe within the Power BECCS Business Model. Investors understand existing strike price arrangements and there is already a body of modelling that forms the basis of such models. As such, we consider it right to maintain the current methodology of basing the CfDe strike price on the cost of unabated biomass generation.

Equally, it should be recognised that when related to bioenergy and done following strict sustainability governance arrangements, unabated generation remains low carbon and beneficial to decarbonisation. It is, therefore, appropriate to see the cost of such generation appropriately support at a rate aligned to cost.

8. Are there any risks or concerns around setting the CfDe strike price that have not been mentioned here?

On a wider note, we would also see the need for a liquidity 'test' and ongoing review, which should ensure that once negative emissions are recognised in the UK ETS, the GGR unit trade is in sufficient volumes so a generator may hedge their position. In a market suffering from low liquidity, high volatility and credit constraints, a generator may incur material costs and risks just to achieve a hedge against a reference price. This is a risk in the current CfD and should be further considered in the design of the CfDe + CfDc model.

9. The CPI indexed strike price option requires the project to bear the risk of biomass costs and is the option in current contracts. Is this an appropriate allocation of risk? Please provide rationale and evidence for your answer.

10. Do you agree with the outlined approach to setting the CfDc strike price? If not, are there any alternative methods to setting this that should be considered?

The set-out approach seems conceptually sound, however, we stress that the definitive cost data for the listed criteria remains limited and likely to change significantly as further sites are developed, supply chains become established and skills within the sector grow. Allowing for some economies of scale to be realised. Downstream, as recognised by the consultation, the market for negative emissions is also currently immature.

As explored further in question 12, it is likely appropriate, that to start with T&S costs are kept separate from the CfDc payment and, therefore, outside of strike price consideration at this point.

11. Are there any risks or concerns around setting the carbon strike price that have not been mentioned here?

Given the nascent nature of the sector, and the lack of cost data mentioned in question 10. We again highlight the difficulty there will be in setting an appropriate CfDc strike price for first-of-a-kind projects. As mentioned in question 5, Government should consider how this is best dealt with in early projects, either by providing a Negative Emission Payment in early contracts, to assist in price discovery, or basing the strike price on full costs and sales achieved, effectively setting the reference price at zero. This will create a predictable financial model while providing time for price discovery in the sector to be achieved and a more accurate CfDc strike price to be set.

12. Should the T&S charges be a separate payment?

Given the current uncertainty of T&S charges, and the fact that such infrastructure delivery may not be the direct responsibility of the power BECCS developer, it is appropriate at this stage that the T&S payment should be kept separate from the 'CfDe + CfDc' mechanism, as they will be difficult at this stage to model into the strike price.

This is especially true given that T&S charges may vary significantly between projects given different circumstances. For example, smaller power BECCS projects, based outside of currently expected clusters, may not have easy access to a carbon pipeline and choose to use alternative transport methods, where prices can expect to be significantly different and based on different metrics.

Over time it could be appropriate to simplify things by bringing T&S charges into the CfD mechanism, but this will require a more stable and predictable market than currently available.

13. Do you agree with a proposed contract length of 10-15 years? If not, why not?

Yes, a 10-15 year contract length is seen as appropriate. We would encourage the BEIS Power BECCS team to also consider the mechanisms seen within the Dispatchable Power Agreement (DPA) or the Industrial Carbon Capture Contract, which allows for a degree of flexibility in setting contract length to the relevant project.

Within the DPA initial projects, regardless of whether they are new build or retrofit, can choose an appropriate term length between 10 and 15 years.

Similarly, the ICC allows for 10 years with the option of a 5-year extension if specific market conditions are met.

Both these arrangements recognise that different sites, and financiers, are likely to have different appetites for contract length, especially with an initial first-of-a-kind project. Further discussion should be had with the industry to identify which of the above approaches would be best suited for Power BECCS arrangements.

14. What are your views on the suggested options?

It is not yet clear within the industry what the best approach to providing biomass protection on feedstock costs is. As such we see value in further exploring with the industry all three options of doing nothing, a fuel cost index or a gain-sharing mechanism. A consultancy could be engaged to further consider and model these options for a fuller evidence base on which to base policy decisions.

We would, however, remind BEIS that there is a range of feedstock supply chains, considering domestic and imported virgin biomass, waste wood or innovative energy crops. All will have variations in cost, so further consideration will need to look across multiple feedstock options.

These options may also be impacted by the outcomes of the government's Biomass Strategy, which is expected to determine a priority use framework for biomass feedstocks and could have a direct impact on supply chains. As such development of this business model must consider strategy development.

15. Are there any alternative methods to mitigate the biomass price risk that we have not discussed?

16. What are your views on the proposed options?

Given the current uncertainty of T&S charges, and the fact that such infrastructure delivery may not be the direct responsibility of the power BECCS developer, it is appropriate at this stage that the T&S payment should be kept separate from the 'CfDe + CfDc' mechanism, as they will be difficult at this stage to model into the strike price. Further modelling based on the proposed approach of utilising the annual T&S Charges statement, flow charge and capacity & network charges, will be needed to be done by the industry and government to give confidence to investors concerning appropriate costs and payments.

This is especially true given that T&S charges may vary significantly by project given different circumstances, where not all the listed variables in the consultation may apply. For example, smaller power BECCS projects, based outside of currently expected clusters, may not have easy access to a carbon pipeline and choose to use road transport methods, where flow and capacity charges clearly may not apply.

The REA is happy to work with industry and Government to further explore these costs and the appropriate way of seeing them set and renumerated.

17. Where should the T&S charges should be sourced from?

18. Should the plant run unabated during periods of T&S unavailability, such as temporary outages?

Yes.

Given that biomass power generation is recognised as low carbon without abatement, contributing to the decarbonisation of the power system, while delivering firm power, it remains entirely appropriate that such a site continues to be able to operate unabated and able to still receive the CfDe proportion of the business model mechanism.

If carbon capture and storage is not taking place due to an issue within the developer's control, it is likely appropriate to withhold the CfDc proportion of the payment while the site or T&S services are down. This will also provide a strong financial incentive to see issues resolved and operational again as soon as possible.

19. Do you have any evidence or thoughts on ways to manage CCUS costs in the event of T&S network unavailability?

No comment on this section.

20. What do you believe is the most appropriate market framework for supporting FOAK power BECCS 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 of the GGR consultation, indicating which option or combination of options would be preferable to achieve the objectives for power BECCS.

As described in the REA's response to the Governments consultation earlier in the year, the REA are in favour of seeing the inclusion of GGR Units within the UK ETS as the main market framework for establishing a negative emission market [1]. This, in the longer term, should be able to support GGR development, reducing the need for Government based support mechanisms.

A good foundation for UK ETS design consideration can be found in a report published by Oxera [2] in which they propose three models of greater or lesser integration of a GGR unit into an emission trading scheme. However, they note that all require a reduction in the number of emission allowances to apply pressure on market participants to continue to decarbonise rather than rely solely on removals. These designs include:

1. Separate Markets for EA's and GGR units, with the Government acting as a broker to control numbers of EAs and GGRs, affecting both their price and availability to drive market participant behaviours.
2. Separate markets, but with a price cap for GGR units, so that GGRs do not become more valuable than EA's.
3. Fully integrated markets whereby EAs and GGRs are auctioned together assuming the cost convergence of the two units within a mature market scenario.

It is possible these three models likely reflect transitional steps Government may wish to consider in the introduction of GGRs. Option one provides the most control, as the GGR market is established, and participant behaviours can be monitored. Whereas option three reflects a long-term aim whereby the market is operating with limited government intervention. As such these steps could be considered the transitional pathway for how the framework could develop over the next decade.

The establishment of a GGR unit in the UK ETS would also necessitate a government-backed accreditation for negative emissions. It is appropriate then for there to be opportunities for market participants to interact both with the voluntary market and for those sites developing GGRs outside of the UK ETS to also have the option to be able to provide credits into the ETS. This of course will need careful accounting and likely require the establishment of suitable registers of credits to ensure that there is no double counting between markets. The design of GGRs within the UK ETS should set the expectation from the start that in the medium to long term it aims to interact with other GGR markets. Confirmation of those linkages can then be confirmed once robust processes are in place.

Finally, members also raise that it will be important that GGR Units, within the UK ETS, can demonstrate a level of price-parity between ETS allowances to ensure they are appropriate values within the market and there is demand for their use. It may also be appropriate to consider a need for a liquidity 'test' and then an ongoing review, which should ensure that the GGR Units trade in sufficient volumes so a generator may hedge its position. In a market suffering from low liquidity, high volatility and credit constraints, a generator may incur material costs and risks just to achieve a hedge against a reference price. This is an exciting risk in current CfD, and could be addressed in the design of the Cfdc+CfDe model.

[1] The REA's response to the consultation on Developing the UK Emission Trading Scheme can be read here: https://www.r-e-a.net/resources/rea-draft-response-to-developing-the-uk-emissions-trading-scheme-call-for-evidence/

[2] Market design for negative emissions in the UK ETS, Oxera, April 2022. https://www.oxera.com/insights/reports/market-design-for-negative-emissions-in-the-uk-ets/

Section 3: Sustainability and negative emissions

21. Do you agree that a power BECCS project should report against a suitable threshold to ensure that we achieve a minimum level of net-negativity from any power BECCS project is achieved?

Conceptually we agree that there be a suitable threshold for net negativity and that over time there is a predictable trajectory for seeing this slowly tightened. This is important for establishing public confidence in the technology and ensuring there is transparency around the volumes of captured carbon.

Such a threshold and trajectory, however, must be carefully set and based on real-world data and practices. It must also recognise multiple supply chains including imported and domestic virgin biomass, waste wood and energy crops. There should be full transparency and clear predictable levels set, well in advance of their implementation, for the threshold so that the industry is clear on what they are expected to achieve and in what timescale.

Finally, we also stress that there must be consistency in how all GGR technologies are treated, with the same suitable threshold applied across all the associated carbon capture business models. Failure to see equal treatment between the ICC, GGR, DPA and Power BECCS model could lead to unintended consequences. This is especially true if there are to be biomass-based energy projects supported under the other Business models outside of the Power BECCS scheme.

22. Do you have any evidence to share that could support the determination of a suitable supply chain GHG emission threshold for power BECCS, including by how much they could be strengthened?

There are already well-established carbon accounting methodologies for biomass supply chains which must form the basis of determining a GGR threshold. Added to this will need to be clear and reliable studies on emissions associated with capture and T&S emissions.

We also reiterate that similar approaches must be applied to all biomass supply chains and GGR methods to ensure a level playing field.

23. Out of the three options, which option do you prefer for assessing power BECCS? Do you have any other recommendations on an alternative suitable method?

Conceptually we support further consideration of Option 3, a combined negative threshold, as being the most accurate way to reflect the full emissions of the capture process. However, further modelling and analysis of the resulting threshold will need to be done, in conjunction with industry, to fully understand the impacts of setting the threshold in this manner. The REA are happy to support in engaging with industry and government to explore this option further.

24. Of the two options considered (net and gross), which do you think is most appropriate for the reward of power BECCS through an appropriate carbon market?

Gross.

Given the fact that all supply chain and capture emissions are included in considering the net negativity threshold, it is appropriate that the total volume of stored carbon is then rewarded. The threshold and process are there to ensure net negativity is achieved and is therefore inappropriate to penalise payments further when these emissions have already been accounted for. Only paying on a 'Net approach' will add unnecessary complexity to the mechanism and risk seeing inconsistent approaches to payments across GGR technologies.

25. Is there any further evidence or arguments we should consider for either taking a gross or net approach in the power BECCS business model?

It is important that there remains consistency of approach across Business Models and then within the design of negative emission GGR units within the UK ETS. Maintaining a Gross payment approach, along with a net -negativity threshold will help to streamline this process and ensure consistency in the future. Enabling the sector to move away from direct government support faster.

REA, September 2022