Department for
Business, Energy
& Industrial Strategy

Power Bioenergy with Carbon Capture and Storage (BECCS) Project Submission

Background and Guidance for submission

August 2022

Any enquiries regarding this publication should be sent to us at: powerbeccs@beis.gov.uk

Contents

1. Background and Introduction

The government is publishing this document to support completion of the power bioenergy with carbon capture and storage ("BECCS") Project Submission form.

This submission is for power BECCS projects' application and assessment to enable project selection and alignment to Track-1 of the Cluster Sequencing programme.

This document outlines the government's commitment to deploy engineered greenhouse gas removals (GGRs) by 2030, and the role power BECCS can play in achieving ambitions set out in the Net Zero Strategy. It sets out progress to date and next steps for project shortlisting and assessment.

2. Bioenergy with Carbon Capture and Storage

Power BECCS refers to conventional biomass power generation with the capture and permanent storage of biogenic CO_2. BECCS can also be deployed alongside various technologies, including conventional combustion technologies, gasification, sustainable fuels production, steam methane reforming and anaerobic digestion, delivering both low-emission energy and fuels, as well as negative emissions.

This document and accompanying project submission form is intended for power BECCS projects. Government uses the term power BECCS to refer to sustainable biomass fuelled power generation plants that produce power (or power and heat) and negative emissions as their only outputs.

2.1 Power BECCS and Engineered Greenhouse Gas Removals (GGRs)

In October 2021, government published the Net Zero Strategy[1], which outlined the role that engineered greenhouse gas removal (GGR) technologies would need to play in supporting decarbonisation by 2050. The government is clear that the purpose of GGRs is to balance the residual emissions from sectors that are unlikely to achieve full decarbonisation by 2050 and will not be substitutes for ambitious mitigation to achieve net zero. BEIS analysis at the time of the Net Zero Strategy shows that GGR technologies may be required to deploy from zero today to around 23 $MtCO_2$/year by 2035 and between 75 and 81 $MtCO_2$/year by 2050, with higher and lower deployment possible depending on sector-specific and wider economy developments. The government has also set the ambition of deploying at least 5 $MtCO_2$/year of engineered removals by 2030.

With reference to BECCS specifically it stated that:

‘BECCS technologies will include retrofit applications in the power and industry sectors. BECCS applications in the power sector could be deployed by the late 2020s, and potentially achieve ambitious contributions to our Nationally Determined Contribution (NDC) target by 2030. Engineered removals are likely to be located within or near industrial clusters, benefitting from access to CO_2 transport and storage infrastructure, essential to support delivery of net-negative emissions.’

Government has signalled intent to pursue BECCS in line with delivering on these targets.

[1] https://www.gov.uk/government/publications/net-zero-strategy

The Biomass Policy Statement (November 2021) outlined the rationale for BECCS stating that:

'When undertaken sustainably, BECCS can deliver negative emissions because carbon sequestered in biogenic material is captured and stored after combustion, resulting in a net decrease in atmospheric CO_2 overall.'

Modelling to inform the Net Zero Strategy suggests that by 2050, engineered removals at large scale, between 75 and 81 $MtCO_2$/year, will be needed to help compensate residual emissions. This will be equivalent to 45-80% of total emissions captured across the UK economy and we expect to see predominantly the scale up of power BECCS alongside direct air capture with carbon capture and storage ("DACCS") and BECCS with gasification technologies. Based on available evidence and information submitted to BEIS as part of the GGR EOI, power BECCS could play an important role in the GGR effort share in this period, thanks to opportunities to retrofit existing large-scale biomass plants. In total, power BECCS is expected to deliver a steady increase of engineered removals between the late 2020s and 2035. This assessment is supported by Climate Change Committee (CCC)[2] and National Infrastructure Commission (NIC)[3] reports, which both see a role for power BECCS in contributing to our nearer term 2030 and 2035 targets. A BEIS study on GGRs[4] highlighted the relatively advanced technology readiness of power BECCS compared to several other engineered GGRs, with a Technology Readiness Level (TRL) of 7.

2.2 Cluster Sequencing Programme

A key interdependency for power BECCS and other engineered GGR technologies is the transport and storage (T&S) infrastructure required to deliver negative emissions. The Cluster Sequencing Process launched in May 2021 and aims to deliver a minimum of two clusters by the mid-2020s and four by 2030, at the latest.

Hynet and the East Coast Cluster have been confirmed as Track-1 clusters for the mid-2020s and will be taken forward into Track-1 negotiations. The Acorn Cluster was announced as a reserve cluster.

The Cluster Sequencing Process has been executed across two phases:

In Phase-1, government received submissions from CO_2 transport and storage companies (T&SCos), and prospective projects for these clusters. Government then provisionally sequenced those clusters which are most suited to deployment in the mid-2020s onto Track-1

[2] CCC. *Sixth Carbon Budget report*. London: CCC, 2020. Available at https://www.theccc.org.uk/publication/sixth-carbon-budget/
[3] National Infrastructure Commission. *Engineered Greenhouse Gas Removals.* London: NIC, 2021. Available at: https://nic.org.uk/studies-reports/greenhouse-gas-removals/engineered-greenhouse-gas-removals/
[4] BEIS. Greenhouse gas removal methods: technology assessment report. BEIS, 2021. Available at: https://www.gov.uk/government/publications/greenhouse-gas-removal-methods-technology-assessment-report

in accordance with government's stated objectives. Power BECCS projects were included in Phase-1 cluster applications.

In Phase-2, government received submissions from individual Projects (industry, power, hydrogen sectors) to connect to the Track-1 T&S Networks. The most recent Phase-2 announcement[5] outlines the shortlisted projects from Power CCUS, CCUS-enabled Hydrogen and ICC projects that will be proceeding to the due diligence phase. Following agreement of an affordability envelope by future Ministers, we aim to commence negotiation of contract terms where possible in Stage 2, before a final decision is made on which projects receive government support and join one of the selected Track-1 CCUS clusters.

Power BECCS and other GGR projects were not invited to submit a full Phase-2 application, due to the relative immaturity of a power BECCS business model, and wider GGR business model development. A separate GGR EOI was launched alongside this with guidance published as part of the Phase-2 guidance. The intent to of this was understand the scale and evidenced market readiness of potential GGR projects within GB that could feasibly connect to Track-1 T&S Networks.

This document, as well as the power BECCS business models consultation and the GGR business models consultation follow on from the publication of the Phase 2 guidance and GGR EOI.

2.3 Greenhouse Gas Removals Expression of Interest

The GGR EOI closed in January 2022. The information provided through the EOI enabled government to understand the market readiness for GGR technology, as well as the range of GGR technologies and carbon removal potential of GGR projects within GB. It also provided information on when prospective projects could feasibly deploy within the 2020s and connect to Track-1 T&S Networks.

As outlined in the supporting documentation for the EOI, the information provided has been used to, 'inform the design of a potential separate evaluation and selection process as a GGR specific part of Phase-2.'

The information provided in the GGR EOIs indicated varying readiness across a range of GGR technologies that could deploy across the 2020s and beyond. Next steps for projects vary on technology type.

As part of the response to this EOI, any prospective power BECCS projects were invited to provide feedback on the Vivid Economics and Element Energy report[6], which outlined a long list and recommended potential power BECCS business models, and risks for investors aiming

[5] https://www.gov.uk/government/publications/cluster-sequencing-phase-2-eligible-projects-power-ccus-hydrogen-and-icc

[6] Investable commercial frameworks for Power BECCS, prepared by Element Energy and Vivid Economics. June 2021. Available: https://www.gov.uk/government/publications/investable-commercial-frameworks-for-power-beccs

to support deployment of power BECCS. A consultation on power BECCS business models was published on 11 August 2022, and will run until 7 October 2022.

A consultation on business models for wider GGRs, as well as a report by Element Energy on potential business models to incentivise GGR deployment[7], was published on 5 July 2022, and will run until 27 September 2022.

2.4 Power BECCS projects

The following objectives have been set for the power-BECCS programme:

- Provide negative emissions to offset hard-to-decarbonise sectors.
- Enable a first of a kind (FOAK) power BECCS project to deploy on a timeline that will enable it to provide genuine negative emissions for Carbon Budget 5, 6 and Net Zero and 2030 Nationally Determined Contributions.
- Enable power BECCS participation in Track-1 of the Cluster Sequencing process
- Ensure that power BECCS plants are subject to sustainability criteria in order to guarantee negative emissions.
- Bring forward power BECCS projects that can deliver the co-benefits of electricity generation and negative emissions.
- Provide sufficient certainty to investors to unlock private sector investment and expertise.

Power BECCS can deliver on two strategic commitments for government: providing large-scale negative emissions to contribute towards engineered removal targets and generating low carbon power, which contributes to security of supply. With the 2030 goal of 5MtCO_2/year of engineered removals in mind, the progress of the Cluster Sequencing Process, and the technical readiness of power BECCS, enabling power BECCS projects to synchronise to Track-1 could enable deployment of BECCS within the 2020s.

Business model development, and this project submission, focuses on power BECCS as an independent technology for several reasons.

Primarily, power BECCS business model development will seek to address the co-output of power that is unique to this type of GGR. As such, it will be subject to the established regulatory frameworks in relation to biomass and power generation markets, and will require specific policy considerations in order to ensure correct behaviours are incentivised, both in relation to the grid, and to achieve the wider societal benefit of negative emissions.

Moreover, as highlighted above, power BECCS is at a more advanced stage of technological development and of evidenced project readiness in clusters to other GGRs, particularly at

[7] Policy Mechanisms for First-Of-A-Kind Direct Air Capture and Other Engineered Greenhouse Gas Removals, Prepared by Element Energy, June 2022, Available here: http://www.element-energy.co.uk/wordpress/wp-content/uploads/2022/06/BEIS-Engineered-GGR-policies-FINAL-REPORT.pdf

scale. Power BECCS is also unique amongst the GGR technology portfolio in that it is consistently modelled to provide the bulk (>50%) of the initial negative emissions reductions, up to 2035, across all scenarios. Separating the business models enables the pace of development to meet the requirements and scale of the accelerated power BECCS sector, where business model development is required over the next year.

The decision was made to separate the business models within a broad framework of alignment, particularly regarding negative emissions markets; using the GGR business model to incentivise existing biomass power generation plants to retrofit power BECCS could incur timing challenges and may not appropriately de-risk and reward the larger scale co-outputs of electricity and negative emissions.

Government is now launching a power BECCS specific project submission process with the intent of bringing forward projects that meet eligibility and pass deliverability assessment onto Track-1. Projects that are successful in assessment will be added to the shortlist for Track-1, to progress to further assessment in a due diligence phase and negotiation before a final decision is taken on which projects receive government support and join one of the selected Track-1 CCUS clusters.

An eligibility requirement has been set for projects to show that they are able to be operational no later than December 2027 to ensure projects can align with Track-1 timescales.

The eligibility criteria outlined here are for First of a Kind (FOAK) power BECCS projects. FOAK refers to the first generation of this technology being deployed within GB and so the eligibility criteria have been drafted to enable the type of deployment that best meets government objectives for initial deployment within GB. Therefore, these eligibility criteria may be subject to change for subsequent rounds of support for Nth of a Kind (NOAK) deployment within GB.

In line with the rapid scaling up of GGR technologies required to reach 23 $MtCO_2$/year engineered removals by 2035 and between 75 and 81 $MtCO_2$/year by 2050, other GGR projects not eligible for this process will also be fundamental to enabling government to achieve these ambitions. Government wishes to continue engagement with these projects and invites these projects to respond to both the GGR business model consultation and the power BECCS business model consultation.

Further information on when subsequent rounds of support will be available, and the application and assessment process for this, will be published in due course.

2.5 Other GGRs

Projects that do not meet the definition of a power BECCS project as outlined in Section 2 will not be eligible to participate in this assessment process.

Projects that responded to the GGR EOI will have been contacted by BEIS via email.

The rest of this document sets out the eligibility criteria, the deliverability assessment, the process for completing the form, and the next steps for power BECCS projects which are in scope of this project submission process.

3. Power BECCS Project Submission

Government now invites power BECCS plants that would like to join the shortlist for Track-1, in order to be considered for FOAK power BECCS business model support, to complete a project submission.

Projects will be asked to demonstrate that they meet the eligibility criteria (listed below) and provide supporting documentation to evidence this. BEIS will conduct a check of the information provided by projects, to ensure a project has demonstrated they meet all criteria. This will include a review of documentation, project plans and other evidence provided to ensure that all criteria are suitably met. Projects will also be assessed on deliverability through the approach set out below and given a score.

Whilst projects may have submitted similar evidence and information as part of the GGR EOI, we ask all projects with the aim of being considered for support to submit a power BECCS project submission containing the most up to date information. No assumptions will be made based on the previous information submitted.

The form also includes questions that will explore the project context for government, such as wider economic benefit, however these will not be used to assess projects and inform selection unless stated.

3.1 Support Package

Projects that demonstrate eligibility and pass deliverability assessment may join the shortlist for Track-1, subject to the shortlisting process set out in section 4.1, to progress to due diligence and negotiation before a final decision is made on which projects receive government support and join one of the selected Track-1 CCUS clusters.

Projects can withdraw at any time, they do not have to participate in the subsequent due diligence or negotiations, however by doing so they will no longer be considered for FOAK business model support. The recently published Power BECCS Business Model Consultation indicates the government's current minded-to position and full contract terms will be available prior to the conclusion of negotiations.

Any award of support is subject to general considerations set out in section 3.5.

Proceeding to the negotiation phase does not guarantee business model support will be awarded. A decision to award support will only be taken after successful completion of any remaining due diligence and negotiation. Projects must also satisfy value for money considerations and support is contingent on affordability and the delivery of the Cluster Sequencing Process and confidence that the relevant infrastructure can be delivered within the necessary timeframes. Further information on negotiations and due diligence is set out in Section 4 of this document.

Only Projects that are successful in submission shortlisting, pass due diligence and then successfully conclude negotiations will be offered business model support.

Funding would not be committed unless: all subsidy control requirements have been met, government is comfortable with any balance sheet implications, all relevant statutory consents have been complete, and government is comfortable that the Project represents value for money for the consumer and the taxpayer.

The timeline for the activities set out above is expected to look like this. Please note that these timelines are indicative, and government reserves the right to alter these timelines at any stage in the process.

Milestone	**Date**
Submission window opens	*24th August 2022*
Submission deadline	*23:59 on 19th October 2022*
Submission evaluation period	*20th October 2022 – 15th December*
Shortlisted projects invited to participate in due diligence stage	*From 15th December 2022*

3.2 General considerations

Without prejudice to any other rights reserved in this document, government reserves the right to discontinue discussions with an Applicant at any point. In particular, government may discontinue discussions with a particular Applicant where:

- the Applicant seeks to renegotiate elements of its Submission which would mean that it no longer satisfies government's eligibility criteria; or
- the Applicant seeks to renegotiate elements of its Submission which would have an adverse effect on the score awarded for deliverability; or
- the Applicant does not comply, or is not able to demonstrate during the negotiation stage that it will be able to comply, with the plans set out in its Submission (including in relation to its supply chain) and/or under any of the evaluation criteria; or
- the Applicant does not comply with the requirements in relation to adherence to the principles and/or terms of the relevant Business Model at any stage of negotiations stage; or
- Government is unable to verify information contained within that Applicant's submission which is relevant to the eligibility criteria and/or the score awarded for deliverability; or

- Government has otherwise determined in accordance with the rules provided to Applicants during any stage of this process or subsequent negotiations stage that the relevant Project will not be awarded financial support; or
- Government's discussions with the relevant Track-1 T&SCo are delayed, aborted or discontinued; or
- Further engagement with project shows they are unable to meet updated sustainability criteria, or value for money considerations.

As regards the previous point, Applicants are advised that government may choose to discontinue engagement with a Track-1 T&SCo and any associated emitters at any time. The exercise of that discretion will be at government's absolute and sole discretion. However, examples of the circumstances in which government envisages exercising such discretion include, but are not limited to government becoming aware that:

- The Track-1 cluster is no longer deliverable within the necessary timeframes. Reasons for this conclusion might include discovery of a severe technical or commercial flaw which significantly impedes the deliverability of the cluster.
- Some or all of the benefits described in that Track-1 cluster's Phase-1 submission are unattainable – for example if cost projections substantially increase, or if projected CO_2 capture volumes fall.
- Government affordability envelopes are not sufficient to support the delivery of a Track-1 Cluster Plan within the Track-1 timescales.

Ultimately, the decision on whether to alter Track-1 will be discretionary and will sit with ministers.

Applicants should also note that being invited to participate in this process does not mean that support will be awarded. The Secretary of State reserves the right to cancel, amend or vary this submission and assessment process as well as the Cluster Sequencing Process, including any envisaged stage and any document issued pursuant to it, at any point and for any reason with no liability on his part. In particular, the Secretary of State is not liable for any costs resulting from any amendment or cancellation of, or delay to, the process, nor for any costs resulting from an Applicant preparing a submission in this process or discussing or negotiating any proposed support mechanisms. Any and all costs associated with your Project's activity related in any way to the Cluster Sequencing Process shall continue to be borne solely by the Project.

The proposed terms of any support which may be offered to any Project following this process, including the form of the Business Models, are not final and remain subject to further development by government in consultation with relevant regulators and the Devolved Administrations, including in the light of the development and Parliamentary approval of any necessary legislative amendments, and completion of necessary contractual documentation in a way which is considered consistent with subsidy control principles.

It is expected that details of support offered for Projects with the exception of commercially sensitive information, may be published following the completion of negotiations and awards.

The process will primarily be executed by BEIS and our technical, commercial, and legal advisors. Support and expertise may also be drawn from across government including HM Treasury, the Infrastructure Project Authority (IPA) and UK Government Investments (UKGI) as well as from its various Partner Organisations including OFGEM, Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) and the North Sea Transition Authority (NSTA).

The department may also share information provided by Projects (including information within the Submissions) with other parts of government for the purposes of policy development and facilitating coordination in certain areas if relevant, for example, CCUS supply chains. In addition, this information may be aggregated and anonymised for the purposes of engagement with external audiences.

3.3 Submission process

Projects will need to complete three documents as part of their submission:

- The power BECCS submission form– Annex 1: this document consists of a series of key questions relating to the details of the Project submission. The Project Submission form (and associated supporting documentation) will form the primary basis for assessing the project.
- Financial statements template – Annex 2: this document seeks information to support our assessment of deliverability and the eligibility criteria 'demonstrated access to finance', and is used to support responses to Section 5.9 of the Project Submissions form. Where your project is being brought forward with the support of additional corporate sponsors or other third-party providers of equity, please fill out this template for each sponsor and third-party equity provider, filling out multiple copies of the template if referring to more than one organisation. It includes tables for you to provide details of the past five years of income statements, balance sheets and cashflow for each organisation. There is also a section for credit ratings and for forecasted profits/losses up to FY 2027/28.
- Reference matrix – Annex 3

Projects wishing to apply must select a Project Representative who will be responsible for submitting all the relevant Project information. The Project Representative is expected to be from the primary, or partner, organisation responsible for Project development which must be a legal entity. Project Representatives must provide completed copies of each of the relevant submission forms.

The Project Representative, as the entity responsible for information submission, will be required to enter into an NDA with BEIS. This NDA will help to ensure that comprehensive and credible supporting information can be effectively provided throughout the evaluation process. The NDA will set parameters for government's use of potentially sensitive information provided as part of the Submissions taking into consideration the Secretary of State's statutory obligations (including under the Freedom of Information Act 2000 (FOIA), the Data Protection

Act 2018 (DPA), General Data Protection Regulation (GDPR) and the Environmental Information Regulations 2004 (EIR)).

The NDA will also set out criteria that the Project will be expected to follow in respect of information-sharing arrangements that they must put in place with Project partners, as further detailed in the section on Anti-Competitive Behaviour, below.

Projects wishing to submit as part of the power BECCS submission process will need to email powerbeccs@beis.gov.uk prior to submitting the forms to indicate that they would like to make a submission and state who their project representative will be. This will enable BEIS to commence the NDA process. Submissions will not be accepted from Projects unless an NDA has been entered into between BEIS and the project representative prior to the submission window close date.

During the submission window, Projects may submit clarification questions on the process by emailing the powerbeccs@beis.gov.uk email address.

In the email, you should explain why the question has been raised so the context is clear. The question should clearly identify the document and text for which clarification is being sought. BEIS will publish the question and the response provided, except in circumstances where the Project sending the question has requested that the question and response is treated as confidential (further details below).

A Project may request, at the time of submitting a question, that BEIS treats a clarification question and its response as confidential. BEIS will advise the Project in advance of providing the answer if it considers that all or any part of the question cannot be treated as confidential, at which time the Project may either withdraw the question or accept that the question and its response will be treated (in whole or part), as non-confidential.

The deadline for the submission of clarification questions is at 23:59 on 5th October 2022, ahead of the submission window closing on 19th October 2022.

Anti-competitive behaviour

The Competition Act 1998 prohibits anti-competitive behaviour such as collusion (including bid-rigging).

In Phase-1 we set out several obligations on Cluster Leads to ensure that confidential information was collated, stored and only shared in a way intended to minimise the risk of anti-competitive behaviour. The details of these obligations can be found in Section 2.1 of the Phase-1 Guidance Document.

Accordingly, Cluster Leads each entered into an NDA with BEIS confirming their obligations which apply throughout this process, including but not limited to mitigating anti-competitive behaviour and managing conflicts of interest. Notably, the NDA required that individuals that have received Confidential Information as part of Phase-1 must not be involved in the

preparation of proposals as part of Phase-2 or power BECCS submissions for the CCUS Cluster Sequencing Process.

The NDA between BEIS and each Cluster Lead also requires the Cluster Leads to provide prospective Phase-2 or power BECCS Applicants wishing to connect to the Cluster Lead's T&S Network with the information and documentation reasonably required for the purposes of preparing a power BECCS submission. This includes both Projects that formed part of the Cluster Lead's original Cluster Plan as part of Phase-1 as well as Projects that did not form part of the Cluster Lead's original Cluster Plan.

As outlined above, Project Representatives will be required to enter into NDAs, to help to ensure that they can share accurate and timely information about the Project, including updating data where applicable, with BEIS. Projects bidding as a consortium are expected to nominate a Project Representative which can act on behalf of the Project and BEIS expects such Projects to have adequate data sharing agreements between Project partners in place.

Power BECCS submission NDAs will also include requirements for Projects to share information and documentation that may be reasonably required with the relevant Cluster Lead to inform discussions and align Final Investment Decisions across the Cluster.

3.4 Eligibility

Eligibility criteria have been developed to identify feasible projects that meet government's strategic goals. Eligibility criteria have been developed in line with the following considerations:

- Ensuring projects provide negative emissions.
- The need for power BECCS to deploy in Track-1 Cluster as part of the Cluster Sequencing process to contribute to the 5MtCO_2/year engineered GGR ambition outlined in the Net Zero Strategy
- Plant contribution to both negative emission targets and to low-carbon power.

For all eligibility criteria, an accompanying rationale has been provided.

3.5 Assessing eligibility

Projects will be asked to confirm they meet eligibility criteria as part of Annex 1 – Power BECCS Project Submission Form, published alongside this guidance document. Projects must outline how they meet the relevant criterion and any supporting documentation they will provide to evidence this. BEIS will then conduct an eligibility check to ensure that supporting documentation provided demonstrates all criteria have been substantially met and evidenced.

BEIS will be looking for credibility and consistency in the information provided. Only those Projects that meet the relevant eligibility criteria will be evaluated further and be capable of being shortlisted to participate in the negotiation/due diligence stage.

During the evaluation process we will perform additional checks on the credibility of the evidence provided and the robustness of any calculations involved, and Projects which fail to provide sufficient evidence in respect of their satisfaction of the eligibility criteria will not progress further into the evaluation process.

We reserve the right to adjust the delivery and milestone dates in the eligibility criteria if a significant number of Projects are delayed such that we are unable to deliver CCUS programme strategic objectives.

3.6 Eligibility Criteria

Power BECCS Projects will be considered eligible if they meet the following criteria:

Located onshore in GB

Projects are required to be located onshore in Great Britain. This criterion has been set to reflect UK government's commitment across the UK to achieve negative emissions to contribute towards the Net Zero Strategy and Sixth Carbon Budget.

Projects in Northern Ireland are not eligible for support in this phase of the process because electricity policy is devolved, and Northern Ireland has a separate electricity market from Great Britain.

Provide net-negative emissions

Projects must achieve permanent atmospheric CO_2 removal through geological storage. For a project to be credibly 'net-negative' it must remove more greenhouse gases (GHGs) from the atmosphere than it creates throughout its entire supply chain (both domestic and international).

Have one of the eligible configurations

The power BECCS plant must be biomass fuelled electricity generation.

The power BECCS plant could be:

- new build (where both generation and capture units are constructed); or
- retrofit (where CCUS technology is applied to an existing generating station, which could range from adding a capture unit, through to repowering the generating station and adding a capture unit).

The power BECCS plant must be one of the following technology types:

- Post-combustion.
- Pre-combustion (on-site).
- Oxy-fuelled combustion.

Use eligible feedstock

Power BECCS plants must use predominantly biogenic feedstock (90% or higher).

As part of BECCS policy development, sustainability criteria for feedstock are under review and recommendations for updating criteria in alignment with the most up-to-date evidence will be published as part of the Biomass Strategy. Power BECCS plants will be subject to any updated criteria accounting for the recommendations published in the Biomass Strategy and will be required to demonstrate the project will meet these upon deployment.

Have access to a CO_2 transport solution and Track-1 or reserve cluster CO_2 storage site

Power BECCS projects across Great Britain are eligible regardless of geographic location and proximity to a T&S network. Projects are expected to demonstrate they have a CO_2 transport solution and access to a Track-1 or reserve cluster CO_2 store. To demonstrate access, Projects should have a provisional agreement, or evidence of progress towards an agreement, with their preferred Track-1 or reserve cluster CO_2 store and CO_2 transportation provider, and clear integration plans.

Have a minimum Projected capture rate of 90%

Projects must be designed to achieve a minimum of a 90% capture rate when the plant is operating at full load.

Calculate it using: $Capture\ Rate\ (\%) = \frac{CO_{2exp}}{CO_{2gen}}$

Where:

$CO_{2_{exp}}$ = total flow of CO_2 into the T&S network during an hour of operation at full load.

$CO_{2_{gen}}$ = total projected generation of CO_2 during an hour of operation at full load.

Have a minimum abated power generation capacity of 100MWe

Through the power BECCS business model we are aiming to bring forward projects that can deliver on our policy objectives as outlined at the start of this document. This means supporting plants that can deliver on both negative emissions targets and provide significant stable baseload power to the grid. Projects must therefore be able to generate a minimum of 100MWe.

Show that the project is able to be operational no later than December 2027

This criterion has been proposed to support delivery of the government commitment to deploy at least 5 $MtCO_2$/year of engineered GGRs in the UK by 2030, as well as to align with Track-1 of the Cluster Sequencing Programme.

The Project must not be considered under another carbon capture business model

The Project must not be considered under another business model to support the costs of building and operating a carbon capture plant, for example, under the Industrial CCUS business model.

Demonstrated access to finance

To ensure Projects which enter the evaluation stage have the appropriate support to reach operation, Projects must be able to show information about their intended financing plan and the status of any discussions with financiers. This could be shown, for example, by a letter from the board of equity partners which commits, in principle, to financing the Project and/or letters of support from financiers. Projects should also state how they intend to progress the financing plan as the project proceeds through further development stages. Government recognises that the support offered will likely be conditional upon the outcome of negotiations.

Have commenced pre-FEED studies or be ready to commence pre-FEED no later than the end of December 2022.

To ensure Projects are at an appropriate stage to align with operational dates of December 2027 or earlier, Projects must at a minimum be at pre-FEED stage or ready to commence pre-FEED no later than December 2022. This must be set out in a Project execution plan as part of the Project submission form.

Show that the Project will be able to have relevant consents in place no later than December 2024

Applicants are required to show that planning consents and applicable agreements have been obtained or demonstrate a proposed process and timetable that allows sufficient time for planning consents and applicable agreements for connecting to gas and electricity networks to be obtained in advance of entry into a potential contract. Applicants are required to show that any applicable agreements for connecting to the gas and electricity networks can be executed on or before the start of the Target Commissioning Window for the installation. This will be considered in further detail at the assessment stage. Timetabling should factor in the expiration of any challenge period for the consents, and we reserve the right to delay or prevent entry into a contract where a valid challenge has been brought within the relevant time period.

The project must not be receiving government subsidy for power generation upon target deployment date.

The Project must not be receiving active government subsidy for power generation at the time of their intended Commercial Operation Date (December 2027 or before).

3.7 Deliverability

Projects will be assessed on deliverability. The deliverability criterion will consider the Project's capability and capacity to deliver successfully and the time at which the Project will be commissioned, as confirmed in the eligibility criteria. Only projects that BEIS determines are eligible after review will then be assessed on deliverability.

3.8 Assessing Deliverability

The submission form sets out a deliverability section (Section 5), with a number of questions to understand the project's projected deployment date and the actions taken to date to enable the project to deploy by December 2027.

The primary tool for assessing against the deliverability criterion will be the Project's adjusted Commercial Operation Date (COD). We define the COD as the date the plant will begin operating and transporting captured CO_2 emissions to permanent storage. In order to determine the adjusted COD, the COD stated in the submission form will be assessed by BEIS and our advisors and adjusted according to our level of confidence in this date. In determining the level of adjustment required, assessors will consider the credibility of the Project eligibility, with the onus on the applicant to provide sufficient supporting information to demonstrate its credibility. In this way, the adjusted COD acts as a combined measure of deliverability and maturity on the one hand, and pace on the other.

By considering the adjusted COD along with a more general evaluation of the Project's deliverability profile, we will assign a deliverability score based on performance against three key factors:

- Government's confidence that the Project is capable of delivering by December 2027 at the latest, such that a Project will score higher if we have a greater level of confidence in delivery in this period.
- The Project's pace of delivery, such that a Project with an adjusted COD in, for example, 2025 will score higher than a Project with an adjusted COD in, for example, 2027 all else being equal.
- The Project's suitability to meet the strategic and technical requirements of the power BECCS programme and provide negative emissions as well as low-carbon power to the electricity system. The factors we will consider are:
    - How the Project has been, or will be, designed to provide negative emissions
    - The ability of the Project to connect to the electricity system.

In assessing against this criterion, Projects will be credited for providing clear and credible evidence of the following in particular:

- The capability and the organisational structure of the Project and the other companies developing the Project.
- The preliminary basis of technical design or similar. This evidence should contain a high-level description which details the technical proposal for the Project.
- A project submission form with strong schedule logic that incorporates activity durations which are judged to be within reason, for example in comparison to similar activities undertaken on other Projects and considering any applicable processes, such as acquiring any necessary planning permissions or procuring suppliers. The critical path and relevant lead times should be clearly identified with floats incorporated as required.
- Progress to date against the stated Project submission, with documentation and engineering information provided to demonstrate that the Project is progressing to plan.
- Progress in applying for and/or securing grid connection agreements for grid connections; if not yet secured, this should be properly accounted for in the Project schedule.
- Accurate identification of the critical planning and consent stages, including environmental permitting and abstraction licensing, with these properly accounted for in the Project schedule.
- Financing arrangements for progressing the Project and the status of key commercial agreements needed to realise the Project, with these properly accounted for in the Project schedule.
- An agreement or evidence of progress towards an agreement to connect to an appropriate T&S Network. We recognise that the level of commitment in place between Projects and T&SCos may naturally vary depending on the Projects and T&SCos stages of development. However, relevant evidence could include:
    - A letter of support from a T&S provider(s).
    - Memoranda of Understanding, connection agreements or draft Heads of Terms with the T&S provider(s).
- Business plans for the organisations involved and details of how the Project fits with the company's overall strategic ambition as well as information relating to financial health. This information should be supported by the Financial Statement Template.
- Detailed registers in place to identify key risks, with mitigations populated and pre- and post-mitigation scores. The Project should demonstrate where mitigations are already in place and present a clear implementation plan where they are not. This should take account of cyber risks to both the Project and the resilience of the infrastructure once commissioned, demonstrating secure by design principles. The Project should also provide evidence of the steps taken to identify and assess cyber risks and the mitigations that will be put in place to ensure strong cyber resilience.
- Clear adherence to safety regulations, and identification and mitigation of any residual safety risks such that they are as low as reasonably possible across all components of the Project.

- Ability of Project organisations to access the proper level of resource and capability necessary to deliver their Project. Specifically, the following may be taken as evidence of this:
    - Key contracts in place with core suppliers – or, at a minimum, substantial engagement with prospective suppliers.
    - Evidence of engagement with technology licensors.
    - Demonstration of the Project Representative's competence to manage and coordinate a programme of the scale and complexity of a Project.
    - Evaluation of capability and capacity of supply chains to deliver required materials, goods, and skills.

The Project submission form includes further prompts as to the specific pieces of supporting evidence which may be beneficial in supporting the Project to perform well against the deliverability criterion.

In light of the responses and supporting evidence provided, assessors will assign a final score to the Project by reviewing both the corrected COD based on evidence and general deliverability evaluation in aggregate, considering all information provided by the Project as well as its credibility. The scoring categories for this criterion are defined as follows:

Table 1: Scoring Categories – Deliverability

Score	Description
Low (1)	Evidence and responses provided in relation to one or more relevant questions are missing or incomplete. • Little to no confidence in the ability of the Project to deploy by December 2027 at the latest and meet our strategic and technical requirements, or in its delivery capability more generally.[8]
Low-Medium (2)	Adequate responses given to all relevant questions, with some level of supporting evidence provided. • Some possibility that the Project may be capable of deployment by December 2027 at the latest and meet our strategic and technical requirements, but limited confidence or certainty that this is attainable.

[8] While delivery assumptions might be more uncertain for less mature Projects (e.g. those at pre-FEED stage), it is expected that they may be in a position to receive a score above Low (1) provided that sufficient evidence and responses are provided in the Project submission form and uncertainties are adequately reflected in the submitted risk registers, costs, Projects schedule, emissions reduction and other contingencies.

Score	Description
Medium (3)	All relevant questions are fully answered and a reasonable level of supporting evidence is provided. • Responses and supporting information give a reasonable level of confidence in the ability of the Project to deploy by December 2027 at the latest and meet our strategic and technical requirements. • However, there may be reservations regarding the credibility of some supporting information, or the Project's capability in certain delivery areas.
Medium-High (4)	Comprehensive responses given to all relevant questions and a reasonable level of largely credible supporting evidence is provided. • Responses and supporting information give a strong level of confidence in the ability of the Project to deliver by December 2027 at the latest and meet our strategic and technical requirements, but potentially less confidence in its ability to deliver at pace within that window.
High (5)	Comprehensive responses given to all relevant questions, with clear and credible evidence provided to demonstrate delivery capability. • Responses and supporting evidence give a high degree of confidence in the ability of the Project to support a COD by December 2027 at the latest, meet our strategic and technical requirements, and to deliver at pace within that window.

To be considered for FOAK power BECCS business model support for Track-1, projects must score 2 or above in deliverability.

3.9 Completing the submission form

Please see the following link for the project submission form. Projects will then be expected to complete the accompanying form identifying supporting documentation that they will provide with the submission as well as completing a financial templates statement.

4. Negotiation/due diligence stage

4.1 Shortlisting of power BECCS projects for negotiation/due diligence stage

After the assessment of deliverability, Projects will be ranked by total Project score from lowest to highest.

Government reserves the right at its absolute discretion to limit the number of Projects which join the shortlist to participate in the negotiation/due diligence stage after applying the process set out in this document. In summary, when deciding which Projects will be shortlisted to participate in the negotiation/due diligence stage, government intends to have regard to:

- the number of Submissions received
- a Cluster Integration Check, which may be relevant, for example, in circumstances in which the potential Projects shortlisted lead to a significant change to the Track-1 T&S Co's submitted Cluster Plan in Phase-1; and
- any affordability, value for money, balance sheet and subsidy control constraints.

4.2 Outline of negotiation/due diligence phase

After the evaluation of power BECCS Project submissions, in line with HMG business case approvals processes, there will be a period of negotiation/due diligence, when Projects will engage with the Department on a variety of technical and commercial issues such as:

- progress on plans for the infrastructure being delivered by the Track-1 T&SCo; and
- the progress on details of the Business Model.

A significant amount of collaboration and coordination is expected during this period. In particular, the eligible Projects would be expected, amongst other things, to be able:

- to demonstrate how their Projects may be incorporated within the relevant T&SCo's Cluster Plans;
- to demonstrate their commitment to achieving FEED and optimising the design of their Projects;
- to move forward with all the regulatory processes and consents needed to realise their Projects;
- to agree a programme of work through to FID, taking account of government processes;
- to share new information across a wide range of issues, including the management of risk; and

- to respond to requests for information from advisers as due diligence commences and progresses.

Projected project cost will be assessed throughout due diligence and post-FEED (when we expect projects to have the most accurate picture of cost). Project cost will be reviewed by technical advisors against industry benchmarks for suitability as well as through financial modelling.

When selecting projects for the final network design list a value for money assessment at both the project and cluster level will be undertaken. Projects that do not demonstrate value for money will not be taken forward.

4.3 The objectives of the negotiation/due diligence stage

Applicants are reminded that government is continuing to develop the processes applicable to the negotiation/due diligence stage of this process, which follows Phase-2 and this power-BECCS Project Submission process. In particular, government reserves the right to make changes to the processes described in this document. Details of the processes and applicable timelines will be communicated in the invitation to participate in the negotiations and due diligence stage.

The negotiation/due diligence process is being carried out in parallel with a process of further engagement with the Track-1 T&SCos. In this context, government recognises that changes to this process will have implications for the Track-1 T&SCos.

Government reserves the right to negotiate any aspect of a Submission and to request any information it requires to carry out due diligence of Submissions. In particular, Applicants should note that the objectives of the negotiation/due diligence stage are two-fold:

- first, this stage is an opportunity for government to negotiate improvements from its perspective to the technical and commercial terms of Submissions; and
- second, as part of an ongoing due diligence process, this stage is also an opportunity for government to confirm and verify any aspect of Submissions and to seek updated information from Applicants as Projects achieve important milestones.

Government reserves the right:

- to invite more Projects to participate in this stage than the number of Projects that it intends to offer financial support in order to maintain competitive tension throughout the process; and
- to request additional information from Applicants on some aspects of their Submissions, including with respect to technical, legal, financial and commercial matters.

The decision in relation to how many Projects will be invited to participate in this stage will be taken by reference to:

- Government's affordability, value for money, balance sheet and subsidy control constraints; and
- the number of Projects that have made submissions.

4.4 The invitation to participate in negotiations and due diligence

Government will issue a formal invitation to participate in negotiations and due diligence to the relevant Applicants. That invitation will set out:

- details of any initial submission requirements, including any additional technical, legal, financial and commercial information Applicants will be required to provide to support their Submissions;
- instructions in relation to the submission of that further information;
- instructions and information in relation to the conduct of any discussions that may be carried out between government and Applicants; and
- any other relevant information about the negotiation/due diligence stage.

4.5 The scope of negotiations

The scope of the negotiations will be determined by the Business Model and further process design, once developed. BEIS aims to publish a draft Heads of Terms for power BECCS in Q2 of 2023.

4.6 Announcement of selection decision

Following evaluation of projects and close of negotiations and due diligence processes, government intends to announce the list of Projects it intends to provide financial support.

The decision to award support at any stage of this process will be subject to government first satisfying itself as to compliance with relevant technical, legal, financial, commercial or policy requirements, including:

- compliance with applicable subsidy control requirements;
- any balance sheet requirements;
- value for money requirements;
- verification of compliance with the applicable eligibility requirements; and
- a further Cluster Integration Check.

Any decision to award support under this process will also be subject to conditions being satisfied, including:

- Applicants demonstrating sufficient progress towards satisfying pre-contract signature requirements (e.g., obtaining any necessary planning and environmental consents);
- Applicants agreeing final terms with government;
- Applicants agreeing final terms with the relevant Track-1 T&SCos; and
- Government agreeing final terms with the relevant T&SCos.

Applicants that have successfully concluded all stages but are not selected may be placed on a reserve list.

This publication is available from: www.gov.uk/government/publications/cluster-sequencing-for-carbon-capture-usage-and-storage-ccus-deployment-power-bioenergy-with-ccs-beccs

If you need a version of this document in a more accessible format, please email powerbeccs@beis.gov.uk. Please tell us what format you need. It will help us if you say what assistive technology you use.