



Department for
Business, Energy
& Industrial Strategy

Cluster Sequencing for Carbon Capture Usage and Storage Deployment: Phase-1

Background and guidance for submissions



© Crown copyright 2021

This publication is licensed under the terms of the Open Government Licence v3.0 except where otherwise stated. To view this licence, visit nationalarchives.gov.uk/doc/open-government-licence/version/3 or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or email: psi@nationalarchives.gsi.gov.uk.

Where we have identified any third-party copyright information you will need to obtain permission from the copyright holders concerned.

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

Contents

Section 1: Introduction and key information	4
1.1 Background and introduction	4
1.2 Future ambitions and Track-2	5
1.3 Objectives	6
1.4 Process overview	7
1.5 Phase-1 timeline	8
1.6 General considerations	9
Section 2: Entry and eligibility	11
2.1 Entry process	11
2.2 Eligibility criteria	14
Section 3: Submission guidance and evaluation	16
3.1 Submission structure	16
3.2 General considerations	17
3.3 Evaluation criteria	18
3.4 Portfolio considerations	29
3.5 Decision-making process and announcement	30
Section 4: Interaction with Phase-2	32
4.1 Phase-2 overview	32
4.2 Transport and storage	34
4.3 Industrial	35
4.4 Power	41
4.5 Hydrogen	44
4.6 BECCS	47

Section 1: Introduction and key information

1.1 Background and introduction

In November 2020, the government published the Ten Point Plan for a Green Industrial Revolution¹, with commitments focused on driving innovation, boosting export opportunities, and generating green jobs and growth across the country to level up regions of the UK. In doing so, the government has set its agenda for a clean, resilient and sustainable economic recovery, as the UK builds back from the impacts of COVID-19.

Included in the Ten Point Plan was a commitment to deploy Carbon Capture, Usage and Storage (CCUS) in two industrial clusters by the mid-2020s, and a further two clusters by 2030 with an ambition to capture 10 MtCO₂ per year by 2030. In February this year, BEIS published a consultation² seeking input on a potential approach to determine a natural sequence for locations to deploy CCUS in order to meet this commitment.

This document sets out the finalised details of the Cluster Sequencing Process, and provides guidance and supporting information for cluster organisations seeking to enter the process by making a submission aligned to their project core concept. Through the process set out in this document, government will look to identify at least two CCUS clusters whose readiness suggests they are most naturally suited to deployment in the mid-2020s, as part of our efforts to identify and support a logical sequence of deployment for CCUS projects in the UK. We refer to these initial clusters as ‘Track-1’.

In addition to naming the Track-1 clusters we will also name, if appropriate, a set of ‘reserve clusters’ alongside Track-1, composed of clusters not sequenced onto Track-1 but which have met the eligibility criteria and performed to a good standard against the evaluation criteria. Government will retain the option to enter negotiations with these reserve clusters in certain circumstances; these may include, for example, if it becomes clear in the course of negotiations that government’s affordability envelope could support an additional Track-1 cluster, or if a technical fault is discovered in one of the Track-1 clusters. This process, which we refer to as ‘reversing the tracks’, is set out in more detail in [Section 3.5](#) of this document.

Alongside the Track-1 result, expected in October, we will also bring forward further details on a process for finalising Track-2; this is discussed further in [Section 1.2](#) below.

Projects within the clusters sequenced onto Track-1 will have the first opportunity to be considered to receive any necessary support under the government’s CCUS Programme.

This support includes:

- The £1bn CCS Infrastructure Fund (CIF), which will primarily support capital expenditure on T&S networks and industrial carbon capture projects. Being sequenced onto Track-1 does not guarantee that CIF funding will be awarded, nor do we expect that all early clusters will need to draw from the CIF. Any decision to award CIF funding would be subject to the conditions set out in 1.6 below and government being comfortable that

¹ www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution/title

² www.gov.uk/government/consultations/carbon-capture-usage-and-storage-market-engagement-on-cluster-sequencing

CIF funding represents value for money for the consumer and the taxpayer in the context of other government support mechanisms.

- CCUS business models for T&S, power, industrial capture and, potentially, bio-energy with CCS (BECCS), as well as business models for low carbon hydrogen. Further details on the revenue mechanism to bring through private sector investment into industrial carbon capture and hydrogen projects via these business models will be set out later this year.

Further information on these support measures and their respective allocation processes can be found in [Section 4](#) of this document.

By commencing the Cluster Sequencing process, we hope to build on the significant recent steps that government has taken to progress CCUS development, including:

- Confirming Front End Engineering Design (FEED) funding for clusters under the Industrial Decarbonisation Challenge, in March this year³
- Publishing an update on the CCUS business models, in December 2020⁴
- Publishing the National Infrastructure Strategy in November 2020⁵
- Publishing the Energy White Paper in December 2020⁶

In addition to launching Phase-1 of the Cluster Sequencing process, we are in parallel publishing a range of updates across the CCUS programme in order to provide maximum visibility to industry regarding relevant policy developments:

- Update on the CCS Infrastructure Fund (CIF)
- Update on Industrial CCUS Business Models
- Update on Power CCUS Business Models
- Update on T&S Business Models
- CCUS Supply Chains: a roadmap to maximise the UK's potential

A consultation on government's preferred business model for hydrogen will follow shortly.

1.2 Future ambitions and Track-2

Through our legally binding commitment to reach net zero emissions by 2050, the UK government has made clear its commitment to decarbonising the economy. We are also clear on the key role that CCUS must play in enabling this transition; the Climate Change Committee (CCC) state that CCUS is a necessity if we are to reach net zero by 2050 and advise that multiple CCUS clusters need to be operational by the mid-2020s to enable this⁷. The Cluster Sequencing process described in this document, and the package of available support outlined above, represent the next step in pursuing this aim.

³ www.ukri.org/news/ukri-awards-171m-in-uk-decarbonisation-to-nine-projects/

⁴ www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-business-models

⁵ www.gov.uk/government/publications/national-infrastructure-strategy

⁶ www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future

⁷ [Committee on Climate Change Report on Net Zero: The UK's Contribution to Stopping Global Warming](https://www.climatchangecommittee.org/committees/committee-on-climate-change-report-on-net-zero-the-uk-s-contribution-to-stopping-global-warming)

However, the delivery of at least two CCUS clusters by the mid-2020s is not the extent of our ambition, we have committed to support four clusters by 2030 at the latest. Government is also clear that in order to reach net zero *all* industrial clusters will need to decarbonise, and CCUS will play a key role in enabling this. After identifying the clusters most suited to deployment in the mid-2020s, government will continue to work with industry to map and support a logical sequence for future CCUS deployment.

This effort will commence with the announcement of further details on a process for identifying 'Track-2' clusters, which we will bring forward when the sequenced Track-1 clusters are announced, expected in October this year. This update will provide further detail in relation to Track-2 timelines, as well as early considerations around Track-2 eligibility and evaluation criteria and future project allocation processes. Accordingly, government will aim to conclude negotiations with projects within the Track-2 clusters in time to enable them to take Final Investment Decisions (FIDs) from 2024 to then be operational from 2027.

This approach will also help to ensure that clusters not sequenced onto Track-1 are able to secure maximum value from any funding they may have been awarded under the Industrial Decarbonisation Challenge (IDC).

We will continue to engage with industry to develop an approach to Track-2 which balances the needs of CCUS developers with strategic government objectives, such as maximising opportunities to carry forward learnings from Track-1. With this in mind, we would further emphasise that Track-1 and Track-2 are both seen as key components of the overall Cluster Sequencing process, and that the Track-1 sequencing decision will not impact upon government's long-term commitment to CCUS deployment in any given cluster.

1.3 Objectives

By identifying and supporting the CCUS clusters best suited to deployment in the mid-2020s, government aims to realise several key benefits of CCUS deployment, including:

- Improving investor confidence and willingness to commit to CCUS projects by successfully demonstrating the operability and viability of the technology, as well as the effectiveness of the commercial frameworks and risk allocation mechanisms which enable their operation at scale.
- Generating key learnings across CCUS applications to improve cost certainty and reduce cost profiles for future deployment.
- Improving certainty across the sector in mapping the UK's pathway towards successful industrial decarbonisation and the net zero transition.
- Demonstrating international leadership in CCUS and decarbonisation more widely, particularly in the context of the UK's role as chair of both the G7 and COP26 in 2021.
- Positioning the UK as a world leader in CCUS technologies, and accessing the economic benefits associated with this position, through both domestic infrastructure deployment and export opportunities.
- Contributing to both near-term and long-term emissions reduction targets under national carbon budgets.

Last month government accepted the CCC's Carbon Budget 6 recommendation; this is a

significant step in the UK's global climate leadership and CCUS and hydrogen will be critical to meeting these important commitments.

1.4 Process overview

The Cluster Sequencing process will be executed across two phases:

- In Phase-1, government will receive submissions from cluster organisations, and provisionally sequence those which are most suited to deployment in the mid-2020s onto Track-1, in accordance with government's stated objectives.
- In Phase-2, government will receive applications from individual projects across capture applications (industry, power, hydrogen) to connect to the Track-1 clusters. Through this process, government will select projects to enter negotiations for the support packages outlined above.

As described in the consultation, we consider it necessary to conduct the Phase-1 assessment at the cluster level to reflect the inherent interdependency of the CCUS chain. Meanwhile, allowing projects not included in the initial cluster submissions to participate in Phase-2 allows for the opportunity to improve on those submissions and achieve potentially improved value for money outcomes.

However, we need to balance an 'open' Phase-2 process with the need to enable clusters to plan with confidence. With this in mind, we would emphasise:

- That there is flexibility built into the Phase-2 timeline. This flexibility could allow government to progress specific projects more swiftly, should government consider that to be the optimal outcome once all the relevant information has been received. Further information on Phase-2 can be found in [Section 4](#) of this document.
- A number of consultation respondents suggested that 'anchor projects' should progress straight through to negotiations, alongside the T&S in Phase-1; our government response explains why we will not take this approach. Nevertheless, we consider it important to highlight that if a project is mature, fully integrated with the T&S and integral to the cluster, that project is likely to be well placed to perform well against Phase-2 project selection criteria. The onus would be on any capture projects entering in Phase-2, and not on the Phase-1 Cluster Plan, to demonstrate that it would offer a better value for money outcome and not have a material impact on cluster timelines.
- If government does decide to alter the Cluster Plan (by removing a project included on the original Cluster Plan and/or adding an additional project to the Cluster Plan), government is committed to working with the Cluster Lead to ensure the implications for the delivery of the wider cluster are understood and considered accordingly.

This document sets out the full details of the Phase-1 process; further details on the Phase-2 processes for each capture application can be found in [Section 4](#) of this document. Government expects to bring forward full details when the Phase-2 process is launched in August this year.

1.5 Phase-1 timeline

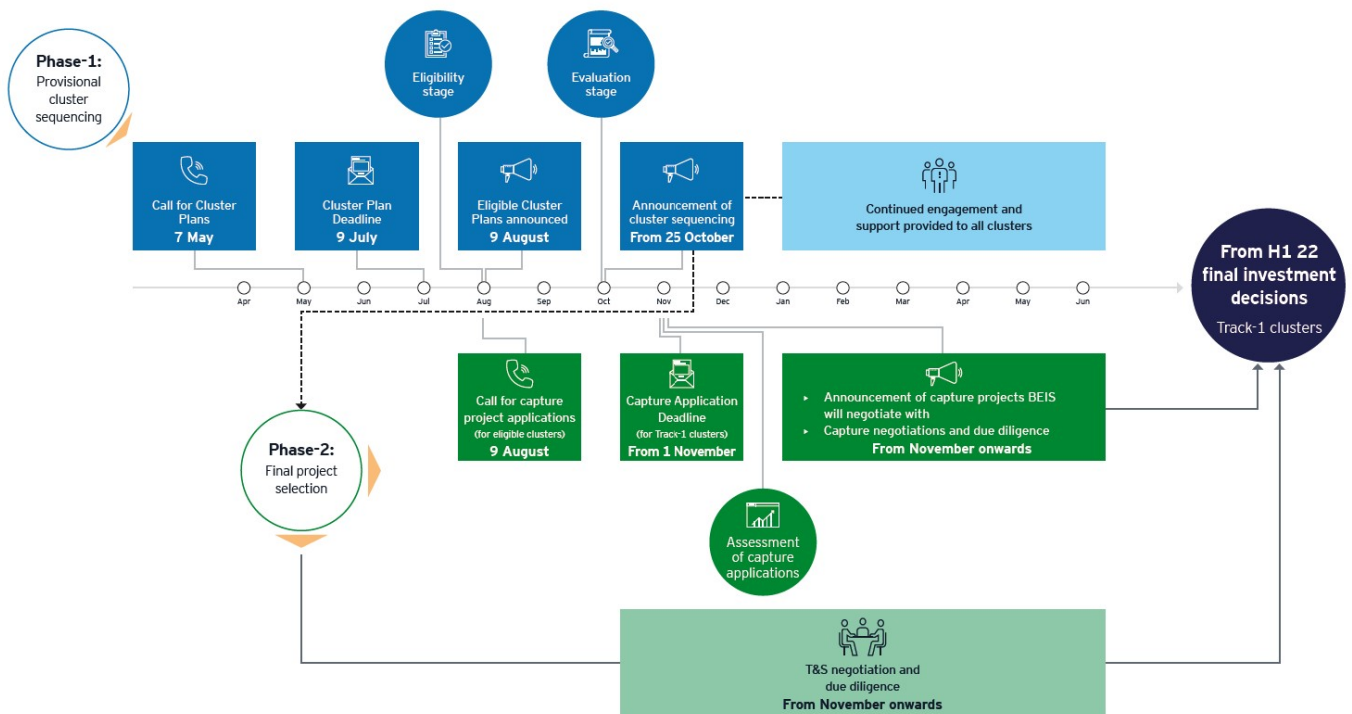
Table 1, below, sets out the timeline on which we intend to execute the Phase-1 provisional sequencing process. Guidance on each of the milestones can be found in later sections of the document. Further information on the timelines for Phase-2 project allocation can be found in [Section 4.3](#) of this document, and these timelines will be confirmed at the launch of the Phase-2 process in August. Please note that these timelines are indicative, and government reserves the right to alter these timelines at any stage in the process.

Table 1: Phase- 1 Cluster Sequencing Timeline

Milestone	Date
Phase-1 Launch	7 May
Phase-1 joint kick-off session	w/c 10 May
Deadline for Phase-1 expressions of interest	21 May
Phase-1 individual submission engagement	w/c 24 May
Deadline for submission of supplementary questions	23 June
Final publication of question responses by BEIS	30 June
Deadline for finalised Phase-1 submissions	9 July
Phase-1 assessment cluster presentations to BEIS	w/c 26 July
Announcement of Phase-1 eligibility assessment	9 August
Phase-1 assessment clarification session	w/c 16 August
Announcement of Phase-1 outcome	From 25 October

This timeline is also reflected in Fig.1, below.

Figure 1: Phase-1 Cluster Sequencing Timeline



1.6 General considerations

Note that being sequenced onto Track-1 does not mean that support will be awarded. Any decision to award support at any stage of this process is only expected to be made subject to government being comfortable with: the application of subsidy control requirements, any balance sheet implications, the status of any relevant statutory consents, and that the project represents value for money for the consumer and the taxpayer.

The Secretary of State reserves the right to cancel, amend or vary the cluster sequencing process, including any envisaged stage and any document issued pursuant to it, at any point with no liability on his part. In particular, the Secretary of State is not liable for any costs (whether incurred by a Cluster Lead, emitter, or an associated entity) resulting from any amendment or cancellation of, or delay to, the process, nor for any costs (whether incurred by a Cluster Lead, emitter, or an associated entity) resulting from an Applicant expressing an interest in the Cluster Sequencing process or discussing or negotiating any proposed support mechanisms.

The proposed terms of any support which may be offered to any cluster following the sequencing process, including the form of the business models, are not final and remain subject to further development by the government, in consultation with relevant regulators and the devolved administrations, as well as the development and Parliamentary approval of any necessary legislative amendments, and completion of necessary contractual documentation. BEIS will separately continue such engagement as it requires in order to refine such submissions, including through engagement with the devolved administrations, to ensure that the proposed policies take account of devolved responsibilities and policies across the UK.

The process will primarily be executed by BEIS and its technical, commercial, and legal advisors. Support and expertise will also be drawn from across Whitehall 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 Oil and Gas Authority (OGA).

Section 2: Entry and eligibility

2.1 Entry process

The entry process for the Cluster Sequencing process consists of three key stages, as set out in the timeline above:

- Expressions of interest
- Submission engagement
- Final submission

Expressions of Interest and NDAs

To be considered under the Cluster Sequencing Process the Cluster Lead must submit an Expression of Interest (EoI) to BEIS on behalf of their cluster. The EoI template can be found on the main Cluster Sequencing landing page, and the deadline for submitting a completed copy of this template to BEIS is 21 May.

After submitting an EoI, the Cluster Lead, as the entity responsible for information submission, shall be required to enter into a non-disclosure agreement (NDA) with BEIS. This NDA will help to ensure that comprehensive and credible supporting information can be effectively provided throughout the evaluation process, as detailed in [Section 3](#) of this document. The NDA will set parameters for government's use of potentially sensitive information provided as part of the cluster's submission 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 Cluster Leads will be expected to follow in respect of information-sharing arrangements that they must put in place with capture projects, as further detailed in the section on Anti-Competitive Behaviour, below. In particular, the NDA will require the Cluster Lead to provide prospective Phase 2 applicants wishing to connect to the Cluster Lead's Transport & Storage Network with the information and documentation reasonably required for the purposes of preparing an application at Phase 2.

Submission window engagement

In order to support clusters in preparing submissions that fit the Phase-1 evaluation criteria BEIS intends to carry out engagement sessions, to ensure clusters have a clear understanding of government's criteria and objectives in the Cluster Sequencing process. Invitations for these sessions will be extended to all clusters which submit an EoI, as above; indicative dates for the engagement sessions as follows:

- Week commencing 10 May: kick-off session, to be held jointly with the CCSA. This will be an open session with clusters attending together.
- Week commencing 24 May: clarification session, to confirm clusters' understanding of the process and evaluation criteria. Clusters to attend individual sessions.

In addition to these engagement sessions, clusters may submit clarification questions on the Cluster Sequencing process to clustersequencing@beis.gov.uk, with an explanation of why the question has been raised so the context is clear. BEIS will publish the question and the response provided to ensure transparency and fairness in the sequencing process, except in the circumstance where the question is designated as confidential. This principle is also applicable to any questions raised in the submission engagement sessions which are not specific to the individual cluster concerned.

A cluster may request, at the time of submitting a question, that BEIS treats a clarification question and its response as confidential. BEIS will advise the cluster 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 cluster 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 23 June, as per the timeline in [Section 1.5](#) of this document. BEIS will be unable to respond to any questions submitted after this date.

Final submission

As per the timeline set out in [Section 1.5](#) of this document, finalised submissions must be submitted to BEIS by 17:00 p.m. on 9 July. Full details and further guidance on the materials which should be included in final submissions are set out in [Section 3](#) of this document.

Each cluster must identify a Cluster Lead which should be the entity primarily responsible for the T&S network and the Cluster Lead should initially identify themselves to BEIS through the EoI, as above. The Cluster Lead should be able to provide evidence of a formal collaboration agreement between cluster organisations, such as a Memorandum of Understanding (MoU) or a consortium/partnership agreement signed off at Board level or equivalent.

Each Cluster Lead should submit only one submission to BEIS and each individual capture project should appear on only one Cluster Plan submission. The Cluster Lead should submit the cluster core concept to BEIS for sequencing – clusters should avoid altering this core concept in an attempt to be sequenced onto Track-1.

Engagement on final submission

BEIS will issue regular clarification questions in relation to the information submitted. Unless specified otherwise, clusters will have three working days to respond to these requests – if an answer is not received within this time limit, then it may not be counted towards the assessment.

BEIS will also host further engagement sessions in the assessment window following the submission of clusters' final submissions, as and when BEIS deems these to be necessary in order to clarify elements of those submissions. The indicative date for this session is as follows:

- Week commencing 26 July: clusters present Cluster Plans to BEIS. Clusters to attend individually.
- Week commencing 16 August: clarification session. Clusters to attend individually.

This date should be treated as indicative at this stage; BEIS will issue invitations to each of the clusters confirming the date once EoIs have been submitted.

Anti-competitive behaviour

The Competition Act 1998 prohibits anti-competitive behaviour such as collusion (including bid-rigging). BEIS is aware that:

- The preparation of submissions may require Cluster Leads to collate confidential information from a range of prospective capture projects, which are not affiliated with one another and may compete with each other for funding at Phase-2 and/or in other markets.
- Some Cluster Leads may also have interests in or relationships with prospective capture projects.
- Breaches of competition law may therefore arise where confidential information is disclosed by prospective capture projects to Cluster Leads.

Clusters are reminded that care must be taken to ensure that any confidential information passing between the Cluster Lead and the prospective capture projects relates solely to the preparation of a Cluster Sequencing submission and any information provided by one party to the other must be provided on a strictly 'need to know' basis.

Information relating to a prospective capture project must only be passed 'up' to a Cluster Lead and not be shared by a Cluster Lead with another prospective capture project. Cluster Leads must ensure that any individuals responsible for collecting information relating to prospective capture projects are not involved in the preparation of any Phase-2 applications.

Particular care will be needed to ensure that representatives of prospective capture projects are not present at submission preparation meetings or meetings with BEIS where they may gain access to confidential information relating to other prospective capture projects.

Cluster Leads will be required to satisfy BEIS at all stages of the Cluster Sequencing process that appropriate arrangements are in place to ensure that there is no risk of actual or potential collusion. If BEIS considers that there has been any co-operation or collusion which actually or potentially undermines or distorts competition, it reserves the right to reject the compromised cluster.

Clusters should seek clarification from BEIS if they are uncertain about their obligations under this paragraph or any other potential competition law requirements.

Process evaluation

BEIS may also contact any organisation named in a cluster submission at a later point to request feedback on their experience of the submission process for evaluation purposes.

2.2 Eligibility criteria

Once finalised submissions have been received, BEIS will assess each submission against the following eligibility criteria, as described in the consultation:

- The cluster must be able to credibly demonstrate that it can be operational by 2030.
- The cluster must be located within the UK.
- The cluster must meet the definition of a CCUS cluster, which we define as a T&S network⁸ and an associated first phase of at least two CO₂ capture projects.

Operational by 2030

This criterion has been included to reflect government's commitment to support the deployment of a minimum of two CCUS clusters in the mid-2020s, and four clusters by 2030. Deployment in this decade is considered to be valuable to government for the following key reasons:

- Foundation for net zero: it is estimated that the UK will require 60-180 MtCO₂ of capture per year by 2050 in order to meet our net zero commitment. CCUS projects have long lead times, so de-risking, learning and gaining cost certainty through the 2020s will be crucial to meeting these longer-term aims. This is reflected in our ambition to capture 10 MtCO₂ per year by 2030.
 - This is also true of other strands of the UK's decarbonisation agenda which are enabled by CCUS, including our ambition to produce 1GW and 5GW of low carbon hydrogen by 2025 and 2030 respectively.
- Near-term carbon budgets: CCUS deployment in the 2020s can potentially make an important contribution to the UK's emissions reduction targets under carbon budgets 4, 5 and 6.
- Maximising comparative advantage: the UK is well-positioned to capture a significant share, worth up to £10bn⁹, of the growing global CCUS market. Moving quickly on deployment will allow us to remain competitive with other countries making material progress on CCUS, such as Norway, the Netherlands and the United States.

As described throughout this document and the consultation, we expect Track-1 clusters to be operational by the mid-2020s, and this is reflected in the evaluation criteria set out in [Section 3](#) of this document. However, we have set the cut-off date for the purposes of eligibility at 2030, firstly in order to allow for flexibility in the event that we do not receive two cluster submissions which can credibly be operational by the mid-2020s, and secondly to ensure greater visibility on the readiness of projects that could be operational this decade.

In order to assess whether a cluster submission meets this eligibility criterion, BEIS will refer to the Commercial Operation Date (COD) stated in the cluster's submission.

⁸ We in turn define a T&S network as a set of onshore pipelines, offshore pipelines and an associated offshore storage facility. The pipelines must be capable of transporting CO₂ to the storage site (for example a saline aquifer or depleted oil and gas field) that must be able to store this CO₂ safely and permanently.

⁹ Pale Blue Dot: Progressing Development of the UK's Strategic Carbon Dioxide Storage Resource (2016).

Located within the UK

As set out in the consultation, this criterion reflects the UK government's commitment to supporting decarbonisation across the UK.

As well as the UK-wide net zero commitment, CCUS deployment can support both Scotland and Wales in meeting their net zero targets of 2045 and 2050 respectively. We will continue to engage with each of the devolved administrations to develop our approach the delivery of CCUS across the UK. In order to facilitate this work, we continue to be open to any CCUS projects across the UK identifying themselves to us.

Meets the definition of a CCUS cluster

We have confirmed our provisional position that meeting the definition of a CCUS cluster will be treated as a requirement for entry into the Phase-1 Cluster Sequencing process. We define a CCUS cluster as a T&S network (incorporating the onshore and offshore network and offshore storage facility) and an associated first phase of carbon capture projects.

This condition restricts entry to those clusters which can demonstrate a coordinated, full-chain submission. This reflects the inherent interdependency of the CCUS chain, as addressed in [Section 1.3](#) of this document. As set out in the consultation, we may look to relax this criterion for future rounds of CCUS deployment, in order to allow for participation by clusters without an integrated CO₂ storage submission.

As per the timeline set out in [Section 1.5](#) of this document, BEIS intends to make an announcement on 9 August confirming which cluster submissions have been assessed as eligible for entry into the Phase-1 Cluster Sequencing process. This eligibility assessment will be made on the basis of finalised cluster submissions, to be received by 9 July.

Section 3: Submission guidance and evaluation

3.1 Submission structure

Clusters must provide completed copies of each of the submission forms found on the Phase-1 landing page, along with supporting evidence where relevant, to be considered under the Phase-1 process. The four forms required are as follows:

- **Annex A – Cluster Plan:** this document consists of a series of key questions relating to the details of the cluster submission. The Cluster Plan (and associated supporting documentation) will form the primary basis for scoring under the deliverability, emissions reduction and learning and innovation criteria, and will supplement the two templates described below in assessing against the economic benefits and cost criteria. Our intention in designing the Cluster Plan document is to avoid making the process unnecessarily onerous for clusters, and to allow for references to supporting documentation, rather than reproduction of information, wherever possible. This supporting documentation should be referenced within the Cluster Plan and submitted alongside it, via the online submission portal.
- **Annex B – Economic benefits template:** this document requires clusters to provide a range of key data inputs, which are used to assess a submission's potential for generating direct, indirect and induced economic benefits. This template forms the primary basis of assessment against the economic benefits criterion. The template allows space for the cluster to explain the underlying evidence and assumptions that have been used to generate the estimates.
- **Annex C – Cost considerations template:** this document requires clusters to input a range of information regarding the lifetime costs of their submissions. Along with information provided in the Cluster Plan, this template is used to calculate a combined Levelised Cost of Abatement (LCOA), which is the primary metric for assessment against the cost considerations criterion.
- **Annex D – References matrix:** this document enables clusters to cross-reference the additional evidence and documents provided with the questions in the Cluster Plan. This will help to ensure all relevant documents are being considered within the assessment.

We would encourage clusters to be aware of the word limits attached to each question in the Cluster Plan. Any information provided above the word limits will be removed before information is provided to assessors and will not count towards the score.

Each of these components must be uploaded by the Cluster Lead through the online submission portal. In addition, the Cluster Lead is required to provide a range of further information directly via the portal, including:

- Corporate information relating to the Cluster Lead and its parent company/companies (if applicable).
- Details for the Cluster Lead's project director.
- Declarations in relation to:

- Compliance of the Cluster project with equalities obligations.
- Applicability of either mandatory or discretionary exclusions to the Cluster Lead organisation.
- The accuracy of any and all information contained within the submission.

Please note that all information requests within the portal should be taken as relating only to the Cluster Lead organisation, unless clearly indicated otherwise. After submitting, clusters will be notified via email to confirm that the submission has been received by BEIS.

Please also note that BEIS reserves the right to use any piece of information provided in any section of the submission to influence any component of the Phase-1 scoring to which it is pertinent.

3.2 General considerations

Credibility and consistency of information

In seeking to identify clusters which are most suited to deployment in the mid-2020s, BEIS will place significant emphasis on the credibility and consistency of information provided. This will also be taken as evidence of the maturity of submissions.

With this in mind, we would advise clusters to ensure that all projections made in their Cluster Plan and wider submission (including deployment dates, capture volumes, and cost profiles) are robust and properly supported by the accompanying documentation that they submit. Across each of the evaluation criteria set out in [Section 3.3](#) of this document, clusters should provide supporting information and evidence which demonstrates the credibility of projections made in their submission. The onus will be on the cluster to demonstrate to BEIS the credibility of information in a way that is considered to be most appropriate; this may be, for example, through evidence of board sign off and/or letters of intent.

Approach to scoring

[Section 3.3](#), below, sets out the evaluation criteria which will be used in assessing the Phase-1 cluster submissions. Clusters will be allocated a score out of 10 against each of the criteria; the methodology for calculating these scores differs between the criteria and is explained in full detail below.

Where the clusters' scores against a particular criterion are determined at least partially via qualitative assessment – that is, for all criteria other than cost considerations – we have provided a set of scoring definitions to indicate how particular levels of performance against those criteria, or sub-criteria, map onto particular scores. In doing so we have defined five scoring categories; this approach reflects the necessary balance between providing as much visibility on the scoring methodology to clusters as possible, and retaining some level of flexibility and discretion, particularly in the event that there is a need to draw a distinction between two or more clusters which have performed similarly against a particular criterion.

3.3 Evaluation criteria

Table 2 below sets out the weightings allocated to each of the Phase-1 evaluation criteria. The headline criteria themselves are unchanged from the consultation:

Table 2: Phase- 1 evaluation criteria

Criterion	Weighting
Deliverability	30%
Emissions Reduction Potential	25%
Economic Benefits	20%
Cost Considerations	15%
Learning and Innovation	10%

Clusters' overall scores will be calculated using their final scores against each criterion, which will then be combined according to their associated weightings, as set out above.

Deliverability (30%)

The deliverability criterion will consider the cluster's capability and capacity to deliver its projects successfully and the timeline on which the cluster and associated capture projects will come online.

The primary tool for assessing against the deliverability criterion will be the cluster's adjusted Commercial Operation Date (COD). We define the COD as the date when ongoing injection of CO₂ emitter volumes into the store begins¹⁰. In order to determine the adjusted COD, the COD stated in the Cluster Plan will be assessed by 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 both the T&S and capture submissions, with the onus on the applicant cluster to provide sufficient supporting information to demonstrate this 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 assessment of the cluster's deliverability profile, we will assign a deliverability score based on performance against two key factors:

- Government's confidence that the cluster is capable of delivering in the mid-2020s, such that a cluster will score higher the greater the level of confidence in delivery in this period.
- The cluster's pace of delivery within the mid-2020s, such that a cluster with an adjusted COD in, for example, 2024 will score higher than a cluster with an adjusted COD in, for example, 2026.

¹⁰ This should not be taken to represent the definition of the COD that will be used within the T&S business model.

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

- The capability and the organisational structure of the Cluster Lead and the companies developing the projects within the cluster.
- An integrated project plan 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 taking into account any applicable processes, such as acquiring any necessary planning permissions or for 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 plan, with documentation and engineering information provided to demonstrate that the cluster is progressing to plan.
- Progress in applying for and/or securing a CO₂ storage licence and permit; if not yet secured, this should be properly accounted for in the project schedule.
- Accurate identification of the critical planning and consent stages, with these properly accounted for in the project schedule.
- At a project level, financing arrangements for progressing the project and the status of key commercial agreements need to realise the project. A practical organisational structure in place to connect the various entities involved in the cluster, enabling them to operate together effectively. This may include Memoranda of Understanding, collaboration agreements or draft Heads of Terms being in place between emitter projects and the T&S entity– however, we recognise that the level of commitment in place between cluster partners may naturally vary depending on the cluster’s stage of development. Off-takers for hydrogen plants will also be considered.
- At a company level, business plans and how the project fits with the company’s overall strategic ambition as well as information relating to financial health.
- Detailed registers in place to accurately identify key risks, and with mitigations populated. The cluster 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 cluster 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 cluster.
- Ability of cluster organisations to access the proper level of resource and capability necessary to deliver their respective projects. 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 Cluster Lead’s competence to manage and coordinate a programme of the scale and complexity of a CCUS cluster.

- Assessment of capability and capacity of supply chains to deliver required materials, goods, and skills.

The Cluster Plan includes further prompts as to the specific pieces of supporting evidence which may be beneficial in supporting the cluster to perform well against the deliverability criterion.

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

Table 3: Scoring Categories – Deliverability

Score	Description
Low (1-2)	<ul style="list-style-type: none"> • Evidence and responses provided in relation to one or more components of the Cluster Plan are missing or incomplete. • Little to no confidence in the ability of the cluster to deploy in the mid-2020s, or in its delivery capability more generally.
Low-Medium (3-4)	<ul style="list-style-type: none"> • Adequate responses given to all relevant questions, with some level of supporting evidence provided. • Some possibility that the cluster may be capable of deployment in the mid-2020s, but limited confidence or certainty that this is attainable.
Medium (5-6)	<ul style="list-style-type: none"> • All relevant questions in the Cluster Plan are fully answered, with a reasonable level of supporting evidence provided. • Responses and supporting information give a reasonable level of confidence in the ability of the cluster to deploy in the mid-2020s. • However, there may be reservations regarding the credibility of some supporting information, or the cluster’s capability in certain delivery areas.
Medium-High (7-8)	<ul style="list-style-type: none"> • Comprehensive responses given to all relevant questions in the Cluster Plan, supported by a reasonable level of largely credible supporting evidence. • Responses and supporting information give a strong level of confidence in the ability of the cluster to deliver in the mid-2020s, but potentially less confidence in its ability to deliver at pace within that window.
High (9-10)	<ul style="list-style-type: none"> • Comprehensive responses given to all relevant questions in the Cluster Plan, 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 cluster to support a COD in the mid-2020s, and to deliver at pace within that window.

Emissions reduction (25%)

The emissions reduction criterion will assess the potential offered by each cluster to generate reductions in CO₂ emissions. We further divide and sub-weight this into three sub-criteria:

- CO₂ volumes to 2030 (60%)
- Potential for future abatement beyond 2030 (30%)
- CO₂ intensity (10%)

CO₂ volumes to 2030

Clusters are asked to provide quantitative emission capture profiles for their capture plants up to 2030, via a template included in the Cluster Plan. The project with the highest stored volumes before 2030 will be assigned 10 points with the remaining clusters assigned a score pro-rated to this according to their stored volumes. The stored volumes used for this criterion will be the stored volumes from primary emitters; we define primary emitter projects as those scheduled to be operational before 2030 and have at least an MoU in place between themselves and the T&SCo.

This score will then be subject to application of a “credibility factor” which will be used to adjust the original score as a multiplier. This credibility factor will reflect both the relative credibility and the certainty of the cluster’s ability to store volumes before 2030. The areas which will be considered to define this credibility factor will be the credibility, associated certainty and relative importance to the cluster of:

- The maturity of primary emitter projects.
- Technical credibility, including flexibility of the project to changes in capture volumes, system conditions or spec, injectivity/short-term capacity of store, T&S availability, emitter capture efficiency, operational risks to T&S capacity and levels of integration.
- The financial credibility of emitters (as well as the financial health of other relevant companies such as any group parent company), the robustness of company business plans relevant to the project & project level financing plans.
- Alternative emitters to those included in the Phase-1 Cluster Plan and diversity of emitter projects included in the Phase-1 Cluster Plan. This includes both diversity between the CCUS applications (industry, power, hydrogen and engineered Greenhouse Gas Removal (GGR) technologies¹¹), and within those applications (e.g. diversity of sectors within industrial capture).
- Credibility of off-takers (where applicable). For example, that there is a known off-taker with an MoU in place. We would also be looking for the Cluster to be able to demonstrate the financial health of the off-takers.
- Any other factor that BEIS considers to materially impact the credibility of an individual emitter or the emitter profile.

The credibility factor will be between 0.5 and 1. BEIS will also remove any emitters that are clearly not credible and may also correct the operation date of any individual emitter, altering the volume profile accordingly.

¹¹ Note that this includes bioenergy carbon capture and storage (BECCS) and Direct Air Capture Capture and Storage (DACCS).

Potential for future abatement beyond 2030

It is important for government to consider the potential future expansion of the clusters and their associated CO₂ storage capacities, as in order to reach the net zero target we will require a significant increase in the level of CCUS as we approach 2050. However, due to the greater uncertainty around longer-term projections for emissions reduction, clusters are asked in the Cluster Plan to present a qualitative account of their plans for additional emissions abatement beyond 2030. This may include the development of additional CO₂ stores/T&S network capacity, additional capture projects, or future CO₂ shipping capability.

Whilst assessment against this component of the emissions criterion will primarily be qualitative, clusters will nevertheless be asked to give a projection of their long-term abatement potential in annual capture volumes.

In order to effectively demonstrate their capacity to deliver additional CO₂ abatement beyond 2030, cluster submissions should reference both specific future emitter projects which are expected to come into operation after 2030 and their longer-term abatement potential more broadly. As with other criteria, BEIS will make an assessment of the credibility of the cluster's projected long-term abatement volumes, which will be factored into the scoring process. The assessment will also consider whether storage sites are suitably sized for the expected CO₂ volumes and whether sufficient cost is included for expansion of stores.

The future abatement potential sub-criterion will be assessed qualitatively, with the scoring categories defined below:

Table 4: Scoring Categories – Emissions Reduction – Future Abatement Potential

Score	Description
Low (1-2)	<ul style="list-style-type: none"> Responses and evidence provided in relation to one of more relevant components of the Cluster Plan are missing or incomplete. Little to no effective demonstration of the cluster's future CO₂ abatement potential.
Low-Medium (3-4)	<ul style="list-style-type: none"> Some possibility that the cluster may be capable of delivering meaningful additional CO₂ abatement beyond 2030, but limited confidence or certainty that this is attainable. Limited scope for the cluster to deliver future abatement at the levels necessary to materially contribute to meeting the UK's net zero commitment.
Medium (5-6)	<ul style="list-style-type: none"> Responses and supporting information give a reasonable level of confidence in the ability of the cluster to deliver increasing CO₂ abatement beyond 2030. Some scope for the cluster to deliver CO₂ abatement at volumes considered reasonable in the context of the UK's net zero commitment.

Score	Description
Medium-High (7-8)	<ul style="list-style-type: none"> • Responses and supporting information give a strong level of confidence in the cluster's plan for scaling up its CO₂ abatement beyond 2030. • Cluster has the potential to deliver additional CO₂ abatement at volumes considered significant in the context of the UK's net zero commitment.
High (9-10)	<ul style="list-style-type: none"> • Clear and credible evidence provided to demonstrate an ambitious and deliverable approach to increasing CO₂ abatement levels in the cluster over time. • High level of confidence in the cluster's potential to achieve the high abatement levels necessary to make a material contribution to meeting the UK's net zero commitment.

CO₂ intensity

The Carbon Intensity criterion is a measure of how much CO₂ has been emitted during the construction and operational phases of the capture, transportation, and storage infrastructure in addition to the measures, processes and design optimisation performed by the cluster to ensure CO₂ emitted by the cluster is as low as reasonably possible.

The factors influencing carbon intensity that will be considered are:

- Operational Carbon Intensity, defined as g/CO₂ emitted per kg/CO₂ stored, of individual emitters and how these compare with benchmarks and similar emitter designs submitted within the cluster or forming part of other clusters.
- Operational Carbon Intensity of the T&S system and how this compares against different clusters bearing in mind that this is likely to be a function of store location and type.
- Availability of the T&S system and individual emitters.
- The process by which the cluster is reducing embedded and operational emissions to be as low as reasonably possible.

The absolute Carbon Intensity of the cluster will also be considered with lower values viewed favourably, however, this will be balanced with reference to the cluster emitter types.

Table 5: Scoring Categories – Emissions Reduction – CO₂ Intensity

Score	Description
Low (1-2)	<ul style="list-style-type: none"> • Responses and evidence provided in relation to one of more relevant components of the Cluster Plan are missing or incomplete and/or • The cluster has no, or very limited, insight into the embedded and operational emissions or processes related to emissions reporting or reduction, cannot demonstrate the impact of design decisions on emissions, and has not considered how to incentivise the supply chain to reduce emissions.

Score	Description
Low-Medium (3-4)	<ul style="list-style-type: none"> The cluster has some insight into the embedded and operational emissions of processes related to emissions reporting or reduction, and can offer some demonstration of the impact of design decisions on emissions, but has not considered how to incentivise the supply chain to reduce emissions.
Medium (5-6)	<ul style="list-style-type: none"> The cluster has good insight into the embedded and operational emissions of processes related to emissions reporting or reduction, and can offer demonstration of the impact of design decisions on emissions, but has not considered how to incentivise the supply chain to reduce emissions.
Medium-High (7-8)	<ul style="list-style-type: none"> The cluster has optimised their design based on cost, schedule and carbon emissions and recorded most decisions with reference to their impact on emissions. The cluster has started to consider processes to reduce the carbon intensity of tier one and tier two contractor procurement and construction/operational activities.
High (9-10)	<ul style="list-style-type: none"> The cluster has fully optimised their design based on cost, schedule and carbon emissions and recorded all decisions with reference to their impact on emissions. The cluster has also defined a process to reduce the carbon intensity of tier one and tier two contractor procurement and construction/operational activities.

As there are multiple sub-criteria within the over-arching emissions reduction criterion, these will be scored separately. Abatement volumes to 2030 will be scored proportionally, with the best-performing cluster scoring 10, and the remaining clusters scored relative to their respective adjusted abatement volumes. Future abatement potential and CO₂ intensity of infrastructure will be scored according to the categories described above.

The overall score for Emissions Reduction will then be calculated according to the sub-weightings set out above.

Economic benefits (20%)

This criterion aims to assess the potential contribution that the cluster can make to the government's objective of supporting clean, resilient and sustainable economic growth as we build back from the impacts of COVID-19. Clusters should look to demonstrate the contribution the cluster can make to the UK economy and government's levelling up agenda.

Assessment against this criterion will be undertaken on the basis of information provided through the Economic Benefits Template (Annex B) and answers provided within the Cluster Plan alongside any associated supporting documentation.

Clusters will be assessed against the economic benefits criterion with reference to three key factors:

- Direct economic benefits, which we define as benefits relating directly to the developer's own activity, and/or the activity of primary contractors.
- Indirect economic benefits, which we define as benefits relating to the remaining supply chain, outside of the developer and its primary contractors.
- Induced economic benefits, which we define as the wider economic benefits that are brought about by the development and operation of the cluster in that local area.

Direct economic benefits

Our approach, as set out in the economic benefits template, will consider direct benefits in terms of job creation: the number of jobs the cluster can create and safeguard, when these jobs will be realised, and the overall wage premium generated by these jobs. The data will be evaluated using standard Green Book appraisal methods. The template will also collect data on the skill level of jobs and evaluate the wage uplift generated via plans for future upskilling and apprenticeships, to the extent that these factors support the delivery of the cluster.

The economic benefits template is structured to allow clusters to provide data for both the direct and indirect jobs they expect to provide through cluster development and operations. The data provided should be separated between T&S and each associated emitter project. As with other criteria, the onus will be on the cluster to provide sufficient supporting information and justification for any assumptions made, and assessors will be instructed to score accordingly.

Indirect economic benefits

Here, as well as the indirect jobs information provided within the Economic Benefits template, clusters should seek to demonstrate how their plans and processes will:

- Develop the regional skills and capabilities to ensure the skills are in the appropriate location to support delivery of the Cluster Plan.
- Ensure all possible suppliers, including SMEs, are aware of planned work and are able to tender for such work.

Induced economic benefits

In line with the commitments made in the Ten Point Plan and the government objective to drive local and regional growth to level up across the UK, clusters should ensure their responses address their contribution to economic growth within the local area, in line with the following key strategic priorities:

- Synergies with other decarbonisation programmes and potential to be a 'SuperPlace': We define a SuperPlace as a low carbon hub of technological development where CCUS, renewables and hydrogen congregate. This could be demonstrated through, for example, the use of blue hydrogen produced in clusters as an energy vector in that local area such as Hydrogen for Heat trials/pilots, or through the mapping of a broader decarbonisation pathway for the region, identifying the economic benefits and opportunities of decarbonisation, as well as the development of skills required to realise these benefits.
- Regeneration and community renewal: clusters should consider how they can contribute to improving and widening the economic benefits associated with their development and operation to local communities. This could include but is not limited to, for example, impacts on air quality, increased attractiveness to other businesses, local transport links

or land value. Clusters should provide evidence of any wider economic benefits that they deem to be relevant. Any engagement with local communities or institutions that has taken place, or will take place, in support of these plans will be seen as beneficial.

- Equality and inclusion: clusters should consider how they can ensure the diversity and inclusivity of their workforce, as well as how to incorporate hiring practices which do not disadvantage those with protected characteristics.

The economic benefits criterion will be scored in aggregate, where all information provided by the clusters across both the Cluster Plan and Economic Benefits template can be considered and contribute to a score out of 10. Scoring categories for this criterion are defined below:

Table 6: Scoring Categories – Economic Benefits

Score	Description
Low (1-2)	<ul style="list-style-type: none"> • The Cluster submissions demonstrate only minimal levels of economic benefit or no economic benefit at all. • Limited evidence provided which gives little to no confidence in the ability of the Cluster to implement and realise any consequential economic benefits.
Low-Medium (3-4)	<ul style="list-style-type: none"> • The cluster submission demonstrates limited levels of economic benefit. • Supporting evidence around economic benefits may be limited in places but gives some confidence in the ability of the Cluster to implement and realise the expected plans and economic benefits.
Medium (5-6)	<ul style="list-style-type: none"> • The Cluster submission demonstrates a reasonable level of economic benefit. • Range of supporting evidence provided, giving confidence in the ability of the Cluster to implement and realise the expected plans and economic benefits.
Medium-High (7-8)	<ul style="list-style-type: none"> • The Cluster submission demonstrates a good level of economic benefit. • Good level of supporting evidence provided throughout, giving a good degree of confidence in the ability of the Cluster to implement and realise its projected plans and economic benefits.
High (9-10)	<ul style="list-style-type: none"> • The Cluster submission demonstrates a significant level of economic benefit. • Comprehensive and highly credible supporting evidence gives a high degree of confidence in the ability of the Cluster to realise its plans and economic benefits.

Cost considerations (15%)

Through the cost considerations criterion, BEIS will determine a Levelised Cost of Abatement (LCOA) considering overall lifetime costs of the cluster (emitters and T&S) and the overall carbon abatement in the proposed Cluster Plan.

The calculation will be performed on the basis of the summated costs and carbon abatement of all projects within the Cluster Plan. The calculation considers only the costs; it does not cover financing costs or revenues as these are dependent on the finalisation of the relevant business models and subsidy support mechanisms throughout the cluster chain.

$$\text{LCOA} = \frac{\text{PV}(\text{Cluster Lifetime Costs})}{\text{NPV}(\text{Cluster Lifetime CO}_2 \text{ Abatement})}$$

Lifetime costs shall cover development costs, capital costs, and operational costs including replacement costs on an annual basis across the complete construction and operational period of the cluster.

The NPV of the cluster's lifetime CO₂ abatement will be calculated on the basis of the adjusted volumes determined in assessing against the Emissions Reduction criterion, as described above.

The LCOA model is expressed through the Cost Template (Annex C), which must be filled out by clusters as part of their submission. Further details and instructions are included within the template. Annex C includes references to a 3.5% discount rate; this is a social discount rate that has been used as a modelling assumption. It is not a reflection of the financing cost that we think will be achieved.

The cost considerations criteria will be scored proportionally, with the cluster with the lowest LCOA scoring a 10 and all other clusters scored relative to that based on their respective LCOA values.

Learning and Innovation (10%)

The creation and sharing of knowledge from early CCUS deployment will be a crucial step in de-risking and enabling cost reduction for future CCUS projects. The sharing of information will also promote innovations and collaboration both within and between clusters. Within this criterion government will be looking for a cluster to demonstrate:

- A strong diversity of capture applications (e.g., power, industry, hydrogen, GGRs) and within application (e.g., type, sector, off-takers) as well as the capability to incorporate shipping of CO₂. Note that BEIS will consider the credibility of each particular emitter, in line with the credibility factors set out under emissions reduction above, when making an assessment of the diversity of capture applications.
- That it will deliver replicability benefits, including having plans in place to reduce future costs of all CCUS clusters and projects.
- That it will contribute to the development of innovative technologies, including those with the potential to develop wider markets.
- That it will generate and share knowledge. Here, government will be considering both the Key Knowledge Deliverables (KKDs) that will be generated and shared as well as the plans the Cluster has in place to proactively disseminate this knowledge in a way to benefit future clusters and projects. This may include working with government, research institutions, Universities, Local Enterprise Partnerships, Higher Education Colleges, and businesses to maximise impact.

- The ability to unlock or add to synergies with other decarbonisation initiatives within the region such as the Hydrogen for Heat trials/pilots, green hydrogen projects or green transport hubs in line with the SuperPlaces concept.
- Any contribution it intends to make to government’s hydrogen ambition to produce 1 GW and 5 GW of low-carbon hydrogen by 2025 and 2030, respectively.

Government will assess the range of technologies that would be developed under each cluster submission, on the basis that a wider range of technologies will naturally support a broader set of learnings for future rounds of deployment.

Previous government CCUS funding allocations have resulted in important information sharing through KKD’s. We would expect a similar level of information sharing as in previous funding allocation rounds¹². For Phase-1, the onus will be on the cluster to describe what KKD’s it will produce and which ones it will be willing to share (either in full or redacted as appropriate). However, specific KKD’s may be introduced at a later date, for example, within Phase-2.

We are also not prescribing a specific level of information sharing, but clusters willing to share more information, and proactively work to maximise the benefits of information shared, will be advantaged through the scoring.

Table 7: Scoring Categories – Learning and Innovation

Score	Description
Low (1-2)	<ul style="list-style-type: none"> • Partial or missing responses to relevant components of the Cluster Plan, with limited supporting evidence. • Submission lacks a clear commitment to information-sharing. • Little to no confidence in the ability of the cluster to support meaningful learnings, or to implement and realise its learning and innovation plans.
Low-Medium (3-4)	<ul style="list-style-type: none"> • Some confidence in the ability of the cluster to support meaningful learnings and to realise its learning and development plans. • Indication of willingness to share key information.
Medium (5-6)	<ul style="list-style-type: none"> • Good confidence in the ability of the cluster to support meaningful learnings and cost reductions and to realise its learning and development plans. • Clear indication of willingness to share information.
Medium-High (7-8)	<ul style="list-style-type: none"> • Full range of supporting information gives good confidence in the ability of the cluster to implement and realise learning and innovation plans for a range of applications, and to support meaningful learnings and cost reductions for future rounds of CCUS deployment in doing so. • Commitment to sharing information.

¹² www.gov.uk/government/collections/carbon-capture-and-storage-knowledge-sharing

Score	Description
High (9-10)	<ul style="list-style-type: none"> • High degree of confidence in the ability of the cluster to realise learning and innovation plans for a wide range of applications, and to support meaningful learnings and cost reductions for future rounds of CCUS deployment in doing so. • Strong commitment to sharing of information.

3.4 Portfolio considerations

In addition to the core evaluation criteria described above, we have confirmed the position set out in the consultation that in making the Phase-1 provisional sequencing decision, government will consider several factors which relate specifically to how the Track-1 clusters perform in combination, rather than individually. These factors will be considered separately from the individual cluster scoring process described above.

The portfolio factors which will be considered are as follows:

- Presence of multiple stores: we believe it to be important that the clusters sequenced onto Track-1 offer multiple CO₂ storage sites. Having multiple stores operational in the mid-2020s is important in allowing for storage resilience and could allow a cluster the opportunity to transport and store its CO₂ elsewhere, in the unlikely event of a permanent fault, or the more likely event of a temporary outage, at its own store. In addition, having multiple stores operational may allow for the relaxation of the storage requirement for future rounds of CCUS deployment, including Track-2.
- Diversity of storage types: a key objective of deploying the Track-1 clusters is to generate learnings and improve cost certainty for future rounds of CCUS deployment. Different store types – for example saline aquifers and depleted oil and gas fields – can support different learnings. Having a diverse set of CO₂ stores in Track-1 will maximise the proportion of future clusters which are able to benefit from these learnings.
- Diversity of emitter projects: as above, we are keen to ensure that the Track-1 clusters can support a range of different capture applications in order to maximise learnings for future deployment. In assessing the Track-1 cluster combination against this factor we will consider diversity across the main types of application (industry, power, hydrogen, and GGRs), diversity *within* those applications (for example emitters from different industrial sectors), and diversity of hydrogen off-takers, such as establishing credible links to or participation in Hydrogen for Heat trials/pilots where applicable.
- Affordability: to be sequenced onto Track-1 clusters will have to be affordable in terms of their draw on both capital and revenue envelopes. Clusters will need to be affordable against these constraints individually but also in combination with any other cluster(s) sequenced onto this first track. The cluster should submit what it considers to be its core concept to BEIS for evaluation.

It is important to note that these portfolio considerations are not necessarily absolute requirements, but a range of considerations which may be taken into account as part of the sequencing process.

3.5 Decision-making process and announcement

Once clusters have provided their submissions and these have been assessed according to the criteria described above, government will:

- Identify the highest-ranked cluster (Cluster 1) according to the five individual evaluation criteria. This cluster will automatically be sequenced onto Track-1.
- If the second-highest-ranked cluster (Cluster 2) performs well against the portfolio factors in a pairing with Cluster 1, this cluster will also be sequenced onto Track-1.
- However, if Cluster 2 does not perform well against the portfolio factors in a pairing with Cluster 1, but the third-highest-ranked cluster (Cluster 3) does, government will have the option – but not the obligation – to sequence the third-highest-ranked cluster (Cluster 3) onto Track-1 instead.
 - The final decision on whether to sequence Cluster 3 over Cluster 2 would be ministerial and would take into account the clusters' performance against both individual and portfolio factors.

As per the timeline set out in [Section 1.5](#) of this document, government will aim to announce the outcome of the Phase-1 provisional Cluster Sequencing process in October 2021. The announcement is expected to consist of two key components:

- Government expects to name a minimum of two clusters which have been sequenced onto Track-1.
- In parallel, government expects to name a list of reserve clusters consisting of any clusters which have met the eligibility criteria and performed to a good standard against the evaluation criteria, but have not been sequenced onto Track-1.

Reserve clusters

By naming a set of reserve Track-1 clusters, government would retain the flexibility to alter the provisional Track-1 sequencing decision under certain circumstances.

Firstly, government may choose to discontinue engagement with a cluster in Track-1 and in such circumstances reserves the right to engage with one of the reserve clusters instead. Some key circumstances in which this situation might arise are as follows:

- In the event that it becomes clear in the course of engagement with projects within a Track-1 cluster that the cluster is no longer deliverable. Reasons for this conclusion might include discovery of a severe technical or commercial flaw which significantly impedes the deliverability of the cluster.
- In the course of engagement with projects within a Track-1 cluster it becomes clear that the benefits described in that cluster's Phase-1 submission are unattainable – for example if cost projections substantially increase, or if projected CO₂ capture volumes fall.

If it emerges in the course of negotiations with projects in the provisionally sequenced Track-1 clusters that government's capital and revenue affordability envelopes could support an additional cluster(s), government may choose to expand Track-1 by elevating a reserve cluster.

Ultimately, the decision on whether to alter or expand Track-1 will be discretionary, and will sit with ministers. If government does opt to alter or expand Track-1 and more than one reserve cluster is available, the decision on which of the reserve clusters is elevated to Track-1 will be made primarily on the basis of the reserve clusters' individual evaluation scores, as well as how they perform as a portfolio with the remaining Track-1 cluster(s) according to the factors described in [Section 3.4](#) of this document. BEIS ministers will retain discretion on precisely how these factors will be applied, and on the final decision of which cluster to elevate to Track-1.

Section 4: Interaction with Phase-2

4.1 Phase-2 overview

In Phase-2 of the Cluster Sequencing Process, government expects to make specific awards of funding to individual projects within, or that could feasibly connect to, the clusters sequenced onto Track-1 in Phase-1 – in doing so, the provisional Phase-1 sequencing decision will be made final.

We have confirmed the position set out in the consultation and referenced in [Section 1.4](#) of this document, that the Phase-2 application process will be open to all prospective capture projects which could feasibly connect to one of the clusters provisionally sequenced onto Track-1, regardless of whether they featured on the submission submitted by that cluster. The core rationale for taking this approach, as described in the consultation, is as follows:

- In allocating capital and revenue support to emitter projects, government will require a process to ensure that this support is appropriately directed, in relation to government objectives. Having an open Phase-2 recognises the potential for misalignment between the corporate objectives of the Cluster Lead and government's own priorities.
- Having multiple projects seeking support has the potential to drive better value for money outcomes for consumers and taxpayers, especially in an environment with significant cost uncertainties.
- The open approach allows a fair opportunity for all existing projects at the cluster location, and potentially at remote sites, to participate in the process, regardless of their affiliation with the cluster consortium. In addition, by signalling our openness to support unaffiliated projects, we hope to stimulate a potential pipeline of new projects in coming forward.

However, as mentioned in [Section 1.4](#), government is mindful of the potentially negative impact of an open Phase-2 on both certainty for developers and information-sharing between individual emitter projects within clusters. With this in mind, we would emphasise:

- If a project is mature, fully integrated with the T&S and integral to the cluster, that project is likely to be well placed to perform well against Phase-2 project selection criteria.
- In addition, the timeline in Table 8 below states that capture project negotiations will begin from November 2021. As a result, we consider there is already flexibility built into the timeline to progress specific projects soon after the cluster decision, should government consider that to be the optimal outcome once all the relevant information has been received.
- Finally, if government does remove a project included on the original Cluster Plan and/or add an additional project to the Cluster Plan, government is committed to working with the Cluster Lead to ensure the implications for the delivery of the wider cluster are understood and considered accordingly.

We expect that Cluster Leads will support government in identifying the best value solution by co-operating in providing any necessary information on how any emitter which is selected at Phase 2 which is not named in its Cluster Plan could be integrated into its solution, for

example, updating its plans for obtaining relevant planning permissions, permits and other consents if required to support the Phase-2 process.

Next steps

As reflected in the timeline in [Section 4.3](#) below, Phase-2 is expected to commence on 9 August. At this point, government intends to announce the clusters which have been assessed as eligible for consideration in the Phase-1 criteria – at the same time, we intend to issue a call for capture projects capable of connecting to the clusters assessed as eligible.

The application window for Phase-2 capture projects is expected to close one week after government announces its provisional decision on the composition of Track-1. For example, an announcement of the Phase-1 results on 25 October, as per the Phase-1 timetable in [Section 1.5](#), would result in the Phase-2 application window closing on 1 November. Confirmation of this application deadline will be provided in the August Phase-2 Launch Document.

Each individual CCUS application offers a distinct package of government support, and as such will run a distinct Phase-2 allocation process. In this section, we set out the following for each application:

- Details of the support package expected to be available to projects entering into negotiations following the Phase-2 allocation process.
- Finalised eligibility criteria for projects seeking government support
- Early considerations in relation to the evaluation criteria, final details will be set out in the Phase-2 Launch Documents in August.

Note that the General Considerations in [Section 1.6](#) apply equally to this section as they apply to the rest of this document.

Table 8, below, sets out the provisional timeline on which government will look to execute the Phase-2 allocation process.

Table 8: Phase-2 project allocation timeline

Date	Milestone
9 August	Announcement of Phase-1 eligibility assessment; launch of Phase-2 for capture projects
From 25 October	Announcement of provisional Phase-1 sequencing decision
One week after the Phase-1 announcement (from 1 November)	Deadline for Phase-2 submissions
From November onwards	Government will announce the Phase-2 decision on which capture projects will progress to negotiations.

Table 8 states that capture project negotiations will begin *from* November 2021 onwards. This is designed to give government the flexibility to respond to the Phase-1 cluster decision and the Phase-2 capture information received. Specifically, we think it is right that in a scenario in which an early, key project on the Cluster Plan has performed well in the assessment and

there are no other applicants in Phase-2 or any applicants that meet the eligibility criteria, that government should endeavour to progress the original Cluster Plan project through. Whereas in a scenario in which there is either a concern about an early Cluster Plan project and/or greater optionality of projects to choose from, we think it is right that government takes the time to reach an optimal allocation outcome for consumers and taxpayers.

Before any support is provided, in addition to the evaluation criteria, government may consider several factors which relate specifically to how the initial Phase-2 projects perform in combination, rather than individually.

Please note that the timelines described above should be treated as provisional at this stage. Government will retain the right to alter timelines if necessary, at any point during the process.

The considerations set out in this section apply to the final allocation process that would take place within Track-1 clusters. Whilst it can be assumed that some of the same considerations will apply later in the 2020s – for example for allocation to projects within Track-2 clusters – we expect that a greater degree of competition is likely to be feasible by that point. For Track-2 projects, we will consider reviewing the eligibility criteria. This might include, for example, amending the minimum operational start date to support projects that will be deployed later than the mid-2020s. We therefore do not consider it helpful or necessary to cement the Track-2 allocation process now but will provide more information on this topic in the October update.

Projects changing cluster

In line with Section 4 of the February Consultation we have retained the option for capture projects to change cluster in Phase-2. Specifically, whilst a capture project can appear on only one Cluster Plan in Phase-1, if that capture project's original cluster is not named onto Track-1 but the developer considers that it could feasibly connect to a cluster that has been sequenced onto Track-1, the Phase-2 application could be submitted for that Track-1 cluster instead.

4.2 Transport and storage

Allocation

By definition, there would only be one transport and storage submission included within each Cluster Plan. However, a 'Phase-2' would still be required for the Track-1 T&S projects, pursuant to which, government would conduct detailed due diligence and agree the specific amount of financing support required.

It is also important to highlight that BEIS sequencing the cluster onto Track-1 would not be sufficient to get the T&S submission to the point of commercial operation. Any T&S network will necessarily need to be compliant with all relevant laws and standards. Therefore applicants should be cognisant of any domestic and/or international legislative frameworks, that could affect the implementation of the T&S network.

In particular, the T&S project lead will also require:

- A Storage Licence and Storage Permit – obtaining the licence and permit would be the responsibility of the T&S project lead. The T&S project having Storage Licence and Permit, or at least a credible plan to obtain these, would count favourably towards the cluster within the Phase-1 sequencing process.

- The relevant planning and consents for the T&S network - obtaining the relevant planning and consents would be the responsibility of the T&S project lead. Having these in place, or a credible route to doing so, would count favourably towards the cluster within the Phase-1 sequencing process.

Support package

It is expected that the Track-1 clusters' T&S submissions would be eligible to receive the following support:

- An economic licence that grants the licensee a regulated revenue stream (the 'Allowed Revenue') facilitated by the right to charge a regulated fee (the 'T&S fee') to users. This licence would be awarded to the T&S project within the cluster locations sequenced in Phase-1. BEIS is continuing to develop the relevant processes and arrangements which will ensure that T&S projects on Track-1 can be kept on schedule to commence commercial operations by the mid-2020s Further details as to the design of the T&S business model can be found in the update on business models, published alongside this document.
- Access to the CIF, if required. One application of the Fund being considered is to reduce the potential revenue gap for T&SCo. By revenue gap we refer to difference between calculated allowed revenue and the revenue T&SCo can collect from early users for their proportionate use of the network. Further detail on this potential application can be found in the recent update on business models¹³. This would be traded off against other potential uses and be subject to further work on the design of the T&S business model.
- Government Support Package (if required) for specified low probability but high impact risks that the private sector would not be able to bear at an efficient price or indeed any price.

As set out in [Section 2](#), government would continue to engage with reserve Track-1 clusters and other potential Track-2 clusters. This would include engagement with the T&S project of these clusters and would be to understand when further intensified support might best be timed.

We will continue to give consideration of the ownership model of the T&SCo as discussed in our T&S business model updates.

4.3 Industrial

Support package

Government will allocate support to industrial capture projects through the Phase-2 process. Projects that are selected for Track-1 following assessment and negotiations are expected to be supported through:

- An element of capital co-funding through the CCS Infrastructure Fund (CIF).
- An Industrial Carbon Capture Contract which will be funded from the exchequer.

¹³ www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-business-models

Projects will submit one application for Phase-2 selection and will automatically be considered for capex co-funding from the CIF and business model support through the industrial carbon capture contract. Further details on the business model can be found in the ICC business model update published in parallel¹⁴.

Entering a bilateral negotiation does not mean that any funding or contract will be awarded. Any decision to award support would only be made subject to the successful completion of any negotiation and due diligence. Any negotiation would only conclude successfully once government has satisfied itself of the desirability of the project through a value for money assessment. BEIS reserves the right to interrupt or terminate these negotiations at any time.

Any support, including the awarded strike price and the reference price, will be published if offered. Commercially sensitive information will be redacted.

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.

Eligibility

The eligibility criteria set out below have been specifically developed for ICC projects entering Phase-2 of the CCUS Cluster Sequencing process. Only eligible projects will progress to the evaluation and bilateral negotiation stages of Phase-2.

For Phase-2 industrial project selection, projects will be considered eligible if they meet the following criteria:

- The project must be located in the UK.
- The project must meet the definition of an industrial facility.
- The project must have access to a carbon transport solution and storage site.
- The project must have commenced pre-FEED studies or be ready to commence pre-FEED no later than the end of December 2022.
- The project must be operational no later than the end of December 2027.
- The project must meet a range of technical eligibility criteria.

Further detail on each of these criteria is set out below.

Located in the United Kingdom

This criterion has been proposed to reflect UK government's commitment to support decarbonisation across the UK in line with our 2050 net zero target.

Meets the definition of an industrial facility

For the purpose of this criterion, an 'industrial facility' is defined as a:

- facility; or

¹⁴ The ICC business model update can be found at: www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-business-models

- part of a facility (including an industrial process or collection of industrial process(es)), which manufactures products, treats materials and/or provides services for use in or as part of an industrial process or collection of industrial process(es) across one or more eligible sectors (being those sectors which are set out below).

Eligible sectors

In order to provide clarity for stakeholders, we are setting out which sectors we consider to be in and out of scope for the ICC business model for the first ICC Contract allocation round.

The industrial sectors we consider to be in scope include (but are not limited to):

- Midstream and downstream oil and gas (i.e. crude oil processing, natural gas processing, refining), iron and steel, cement, lime, and chemicals (including but not limited to fertilisers, pharmaceuticals, retrofitted CCUS-enabled hydrogen production and basic chemicals, such as ethylene and ethanol).
- Additionally, other sectors that are in scope are food and drink, non-metallic minerals, paper and pulp, nonferrous metals and other industry¹⁵.
- Further details on retrofitted CCUS-enabled hydrogen production, Energy from Waste (EfW), and Combined Heat and Power (CHP) eligibility are set out below.

Sectors that are out of scope comprise:

- New build CCUS-enabled hydrogen production facilities.
- Upstream field operations for oil and gas.

The sectors outlined above that are in scope for the ICC business model fall within the Standard Industry Classification (SIC) codes 5 to 33 and 38. However, we do not propose limiting applications by SIC code and note that there may be cases where a project that is classified under one of these SIC codes is out of scope; this SIC code list is therefore provided for guidance only.

CCUS-Enabled Hydrogen – whilst retrofitting CCUS in existing “grey” hydrogen facilities is considered in scope for the ICC business model, new build CCUS-enabled hydrogen production facilities are out of scope. This is because hydrogen production in existing facilities has already proven to be commercially viable and the ICC business model will cover the extension to a capture component. Therefore, existing hydrogen facilities retrofitting CCUS will only be able to apply to the ICC business model for support and will be ineligible to apply for support under the business models in development for low carbon hydrogen. However, the business models for low carbon hydrogen will cover new build CCUS-enabled hydrogen production plants where commercial viability is less established.

Energy from Waste – our current minded-to position, subject to further work, is to support the application of CCUS at EfW facilities, including waste incineration facilities with readiness and/or plans to implement energy recovery, via the ICC business model. This will include existing EfW facilities where the majority of energy output will be used by an eligible industrial

¹⁵ In this context, ‘other industry’ is defined as the subsectors of industry that are not listed here. Industry is typically defined as the various subsectors relating to manufacturing and refining, which fall under SIC codes 5 and 7 to 33 (excluding 24.46).

facility and/or facilities where the energy output will be sold offsite to heat networks or the electricity grid.

It is intended that support will only be provided to the most energy efficient waste management facilities (i.e. only those facilities with energy recovery included) and to plants that are existing or already fully committed to being established, so that this support does not encourage perverse outcomes such as incentivising the construction of new EfW facilities ahead of more environmentally friendly waste management methods.

Therefore, this position is for initial CCUS projects and is subject to change, and the government will continue to develop its approach over the coming months. We will continue to consider the interactions with wider government priorities, including net zero, waste strategy, air quality, clean transport, and value for money as we develop our approach.

Please refer to the ICC business model update published in parallel for more details on the rationale behind this position and wider considerations for the applicability of the ICC business model to these applications. We will look to provide further detail on the applicability and requirements of a EfW facility seeking support in further updates this year.

Combined Heat and Power – our minded-to position is that the ICC business model will support, in some instances, the application of carbon capture at CHP facilities. Support will only be provided for cases where a majority of energy output (electricity and heat) is to be used primarily for eligible industrial processes. This means that the CHP facility must be (i) embedded or adjacent to and primarily used by eligible industrial process(es), or (ii) embedded whereby flue gases (or capture streams) are combined with those from eligible industrial processes and are to be routed to the same capture facility. This includes cases where the CHP facility is owned by a different entity.

We are minded to apply a similar definition of “majority of energy” output as applied under other government schemes, where 70% or more of the energy output must be used for eligible industrial process(es).

Additionally, support will only be provided to the most efficient CHP facilities, for example, those part of the CHP Quality Assurance (CHPQA) programme. We will look to provide further detail on the applicability and requirements of a CHP facility seeking support in further updates this year.

Please refer to the ICC business model update published in parallel for more detail on the rationale behind this position.

Access to a carbon transport solution and storage site

The Phase-2 process is open to applications located across the UK regardless of geographic location and proximity to a T&S network. However, projects are expected to demonstrate that they have a carbon transport solution and access to a carbon store. Although access to a UK store is not a requirement for eligibility, projects which intend to store CO₂ overseas may be required to demonstrate the need to utilise overseas storage capacity ahead of UK capacity.

To demonstrate access, a project should have a provisional agreement with its preferred carbon store and transportation provider and clear plans for how to integrate with this infrastructure.

Pre-FEED stage or ready to commence pre-FEED no later than the end of December 2022

To ensure that a project is at an appropriate stage of development to align with a 2027 operational date (at the latest), it must at a minimum be at Preliminary-Front End Engineering Design (pre-FEED) stage or be ready to commence pre-FEED no later than the end of December 2022. This should be set out in a project execution plan as part of the application.

Pre-FEED is the stage in which a project would have undergone feasibility studies with further definition around cost estimates and technology specification to prove project feasibility and provide a basis to enter into the FEED stage. A more detailed overview of how pre-FEED is defined for industrial carbon capture projects will be provided in further publications.

Note that we would expect projects with earlier operational dates, such as 'anchor projects', to be further ahead with their FEED studies and for this to be considered as part of project evaluation.

The project execution plan must also demonstrate that the project is sufficiently advanced in obtaining planning approvals and other permit consents to align with its delivery timeline, along with information on when any challenge period for a relevant consent expires. We reserve the right to delay or prevent entry into a contract where a valid challenge has been brought within the relevant time period.

Operational no later than the end of December 2027

This deadline has been proposed to align with the government's commitment to deploy CCUS in the UK in the 2020s, with at least two clusters to be operational by the mid-2020s. Note that this is intended as a backstop date; having a credible earlier operational date will count favourably towards the project in the evaluation stage. Note, projects with a later operation date than this can still be included within the Phase-1 Cluster Plan but would only be evaluated as part of the Phase-1 assessment.

Technical eligibility considerations

In order to be eligible for an ICC Contract, the industrial facility will need to be:

- Classed as an eligible CCUS technology.
- Able to sufficiently demonstrate the ability to reach high process capture rates of at least 85%.

Eligible CCUS technologies

In the December 2020 update, we noted that existing industrial facilities retrofitting carbon capture and new industrial facilities with carbon capture technology intrinsic to the process will be eligible for the ICC business model. We maintain this position, while recognising that new build CCUS-enabled hydrogen production facilities are an exception and are instead covered by the business models in development for low carbon hydrogen.

Both the full-scale application of CCUS and modular applications of CCUS are in scope and all carbon capture technologies (including pre- and post-combustion, oxyfuel and emerging technologies) are eligible.

In the December 2020 update, we set out the minded-to position that the ICC business model is intended to be applicable to carbon captured for the purpose of usage (CCU) when it results

in the permanent abatement of CO₂ emissions. This is to ensure alignment with government's net zero ambitions. However, we recognise that this brings additional areas of complexity to the ICC Contract and, as such, we are still considering this application of carbon capture and our position is subject to change as the policy in this area develops. There will be further work throughout the year to detail our approach to CCU.

Technologies that we do not currently consider to be in scope for the ICC business model include CCU resulting in temporary abatement due in part to the prioritisation of permanent abatement methods, Direct Air Carbon Capture and Storage (DACCS) and other GGRs. A call for evidence on GGRs closed in February 2021. Government will set out further details on the evidence submitted in regard to investment frameworks for GGRs such as DACCS and BECCS in due course.

Process CO₂ capture rate

In the December 2020 update, we noted that we would expect a CO₂ capture rate (defined as the percentage of CO₂ captured from the specific gas stream directed to a carbon capture facility, i.e. the capture efficiency of the technology) of 90% to be achievable. However, further work this year (including through gathering stakeholder feedback) has highlighted that this may not be achievable for all industrial facilities across all sectors. This may be due to various reasons, including how the heterogeneity of industry may result in different expected capture rates in different sectors, varying levels of technological readiness and dilute CO₂ concentrations in the stream directed to the capture plant.

We have therefore revisited our expected CO₂ capture rate and now expect a minimum design capture rate (technology efficiency) of at least 85% for both new build and retrofit facilities, with consequences under the ICC Contract (including in relation to payment) if this threshold is not achieved.

While 85% represents a minimum CO₂ capture rate we would expect to see, higher capture rates will score more highly in the evaluation stage. This is to incentivise industry to optimise plant design to achieve higher capture rates and reduce residual emissions in line with net zero objectives. More stringent rules on capture rates may be applied to future projects following learnings from initial applications of carbon capture and as technologies improvements occur. We will continue to test the design of the business model to ensure that perverse incentives are not introduced and barriers to achieving energy efficiency are minimised.

Please refer to the ICC business model update published in parallel for more details on the rationale and a worked example of process capture rate.

Assessment and allocation

A project will submit one application for Phase-2 selection and will automatically be considered for capital co-funding and support through an industrial carbon capture contract.

First, a project will be assessed against the proposed eligibility criteria, which are set out in the section above. Then, those capture projects that pass the eligibility criteria will be assessed against the evaluation criteria to determine which projects will progress through to bilateral negotiations and full due diligence. At the end of that process, government will allocate and award an industrial carbon capture contract to each successful project and an element of capital co-funding. Some of the types of evaluation criteria and associated metrics government are considering are:

- **Emissions reduction potential** - projected capture rates as defined above (%) and projected volumes of CO₂ captured (Mt/year).
- **Cost** - affordability and levelised cost of abatement (£/tCO₂).
- **Maturity of project** – the stage of development, robustness of project execution plan and likely operation date.
- **Learning and proof of concept** - cost reduction and knowledge transfer strategy.
- **Supporting industrial activity and jobs** - projected contribution to employment and GVA, including supply chain plans.
- **Local community engagement** – level of engagement and level of support from local key stakeholders.

In addition to the possible evaluation criteria described above, a portfolio approach is being considered to help government balance several different factors at the evaluation stage including affordability, the decarbonisation options available to industrial emitters and sectors, industrial benefits, and the value of diversity of emitter projects and sectors.

Further details of the evaluation criteria, portfolio approach and supporting evidence required to assess projects will be published later this year.

4.4 Power

Support package

Projects that are selected following assessment and negotiations are expected to receive a Dispatchable Power Agreement (DPA) which will be funded through consumer subsidies. For further details as to the design of the power CCUS business model please refer to the concurrent business model update.

Entering a negotiation does not mean that a DPA will be awarded. Any decision to award support would only be made subject to the successful completion of any negotiation and due diligence. Any negotiation will only conclude successfully once government has satisfied itself of the desirability of the project through a robust and extensive value for money analysis. BEIS may direct the Low Carbon Contracts Company (LCCC) to enter into one or more power contracts. BEIS shall reserve the right to interrupt or terminate these negotiations at any time.

Contracts are only expected to be awarded in Phase-2 if government is comfortable with: the application of subsidy control requirements, any balance sheet implications, the status of any relevant statutory consents, and that the project represents value for money for the consumer and the taxpayer.

Any DPA, including the agreed payment terms, will be published if offered. Commercially sensitive information will be redacted.

Eligibility

The eligibility criteria set out below have been specifically developed for Phase-2 of CCUS Cluster Sequencing process. Only eligible projects will progress onto the evaluation and negotiations stage.

For Phase-2 project selection, power projects will be considered eligible if they meet the following criteria:

Located in the UK

This criterion has been proposed to reflect UK government's commitment across the UK to support decarbonisation in line with net zero.

Have one of the eligible configurations

The power CCUS plant must be gas-fired thermal generation, it could be new build (both generation and capture) or retrofit (applied to an existing generating station), and must be one of the following technology types:

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

Have a minimum abated capacity of 100MW

Through the DPA, we are aiming to bring forward Power CCUS plants that are able to make a significant contribution to electricity system decarbonisation. Therefore, projects that are eligible must be 100MW or over.

Have access to a CO₂ transport solution and CO₂ storage site

The Phase-2 process is open to applications across the UK regardless of geographic location and proximity to a T&S network. Projects are expected to demonstrate they have a CO₂ transport solution and access to a CO₂ store. Although access to a UK store is not a requirement for eligibility, projects which intend to store CO₂ overseas may be required to demonstrate the need to utilise overseas storage capacity ahead of UK capacity. To demonstrate access, projects should have a provisional agreement with their preferred CO₂ store and CO₂ transportation provider, with clear plans on how they will integrate with a CO₂ store.

Have a minimum projected capture rate of 90%

At full load, of combustion gas for the BM unit (as this term is defined in the Balancing and Settlement Code), including any associated combustion sources required for the provision of energy input to the capture process (where applicable). Following the December 2020 update, we have now worked with technical advisers and experts to reach a conclusion on the necessary projected capture rate at full load. Technical evidence shows that plants can be designed for and can be reasonably expected to achieve at least a 90% capture rate.

Confirmed access to finance

Projects must be able to show information about their financing plan. Evidence required will be confirmed at a later date, for example this could include evidence on the status of discussions with financiers.

Able to undertake pre-FEED or ready to commence pre-FEED no later than December 2022

To assure projects are at an appropriate stage to align with 2027 operational dates, projects must at a minimum be at pre-FEED stage or ready to commence pre-FEED no later than

December 2022. Pre-FEED is the stage in which a project would have undergone feasibility studies with further definition around cost estimates and technology specification to prove project feasibility and provide a basis to enter the FEED stage. A more detailed overview of how pre-FEED is defined for power carbon capture projects will be provided in further publications. Note that we would expect projects with earlier operational dates to be further ahead with their FEED studies and for this to be considered as part of project evaluation. To evidence how a project meets this criterion it is expected that a project execution plan or equivalent will be submitted. The plan will need to demonstrate a project's readiness and ability to meet key milestones. The project execution plan must demonstrate that the project is at a sufficient stage of progression in acquiring planning approvals and permit consents such that aligns with their delivery timelines. This will include the expiration of any challenge period for the consents. We reserve the right to delay or prevent entry into a contract where a valid challenge has been brought within the relevant time period.

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

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 the DPA. Show that any applicable agreements for connecting to the gas and electricity networks can be executed on or before the target commissioning date for the installation. 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 DPA where a valid challenge has been brought within the relevant time period.

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

This criterion has been proposed to align with government commitment to deploy CCUS in the UK in the 2020s, with at least two clusters by the mid-2020s. Note that this is intended as a backstop date; having an earlier operational date could count favourably towards the project evaluation stage. Note, projects with a later operational date than this can still be included on the Phase-1 Cluster Plan but would only be evaluated as part of the Phase-1 assessment.

Assessment and allocation

We can confirm the intended use of bilateral negotiations as the mechanism to allocate and award initial power carbon capture contract(s).

For the allocation phase, we are yet to decide on the scope of due diligence and negotiations. We are aiming to release further details on the allocation phase in a subsequent update. Whilst, eventually, we expect Dispatchable Power Agreements (DPA) could be awarded through a wider competitive process, we do not view that an award process such as this would be feasible for the first contract(s). Factors that have influenced this decision include the potential number of appropriately developed power projects, and that government may wish to consider a range of broad strategic factors through the assessment.

We will set out further detail on these additional assessment stages and supporting evidence required to assess projects in forthcoming publications.

Some of the types of criteria and associated metrics government are considering for evaluation are:

- **Emissions reduction potential** – projected capture rates (%).
- **Dispatchability** – capability to provide dispatchable generation capacity.
- **Cost** – affordability and DPA payment rates.
- **Maturity of project** – the stage of development and likely operation date.
- **Learning and proof of concept** – cost reduction and knowledge transfer strategy.
- **Supporting industrial activity and jobs** – projected contribution to employment and GVA, including supply chain plans.
- **Local community engagement** – level of engagement and level of support from local key stakeholders.

4.5 Hydrogen

Support package

Government will allocate revenue support to CCUS-enabled hydrogen plants initially through the Phase-2 process. Projects that are selected following assessment and negotiations are expected to receive revenue support through the hydrogen business model, which will be consulted on shortly. Projects will submit an application for Phase-2 selection to be considered for this support.

The Net Zero Hydrogen Fund (NZHF) was announced in 2020 to provide £240m of support for low-carbon hydrogen production between 2021 and 2025. Projects applying for revenue support through the Hydrogen Business Model may also wish to apply for capital co-funding from the NZHF. We would intend for the allocation process to be supportive of the desire for projects to combine funding in this way, and will confirm in due course with more details on the NZHF and how it interacts with the Hydrogen Business Model.

Further opportunities for allocation of revenue support to hydrogen plants outside of Phase-2 of the Track-1 Cluster Sequencing process will be considered in due course.

Eligibility

The eligibility criteria set out below have been specifically developed for hydrogen projects applying for Phase-2 of the CCUS Cluster Sequencing process. The eligibility criteria for future allocation of support via the Hydrogen Business Model and NZHF, including for other production types such as electrolytic hydrogen, will be considered in due course.

Following the Business Model consultation there may be further requirements that projects applying through the Phase-2 selection process will need to meet ahead of negotiations and final allocation of Business Model support.

For Phase-2 industrial project selection, hydrogen projects will be considered eligible if they meet the following criteria:

Located in the UK

This criterion has been proposed to reflect the UK government's commitment to supporting decarbonisation across the UK.

Be a new CCUS-enabled hydrogen production plant

For this allocation process, only new CCUS-enabled hydrogen production plants will be eligible to apply for revenue support via the Hydrogen Business Model. For existing hydrogen producers looking to retrofit using CCS technology, they are eligible to apply for the Industrial Carbon Capture (ICC) Business Model for revenue support. This is because the ICC Business Model has been developed with the aim of making it commercially viable for existing industrial facilities to decarbonise, including existing production of 'grey' hydrogen. The Hydrogen Business Model aims to make the production of new low carbon hydrogen viable so that it can compete against the high carbon alternative – either fuel or feedstock.

Further information on options being considered for a UK low carbon hydrogen standard, and how it may apply to projects seeking BEIS support, will be set out in the forthcoming consultation on Low Carbon Hydrogen Standards. The consultation has been informed by extensive industry engagement and, depending on the outcome, we intend this to support the assessment process of Phase-2 applications.

Has access to a CO₂ transport solution and a CO₂ storage solution

To support the government's ambition to establish the UK as a hub for hydrogen, the Phase-2 process is open to applications from CCUS-enabled hydrogen projects across the UK regardless of geographic location and proximity to a T&S network. Projects are expected to demonstrate they have a CO₂ transport solution and access to a CO₂ store. Although access to a UK store is not a requirement for eligibility, projects which intend to store CO₂ overseas may be required to demonstrate the need to utilise overseas storage capacity ahead of UK capacity.

To demonstrate access, projects should have a provisional agreement with their preferred CO₂ store and CO₂ transportation provider, with clear plans on how they will integrate with a CO₂ store.

Be at pre-FEED stage or ready to commence pre-FEED no later than the end of December 2022

To assure projects are at an appropriate stage to align with, at the latest, 2027 operational dates, projects must at a minimum be at Pre-FEED stage or ready to commence pre-FEED no later than the end of December 2022. This should be set out in a project execution plan as part of the application.

Pre-FEED is the stage in which a project would have undergone feasibility studies with further definition around cost estimates and technology specification to prove project feasibility and provide a basis to enter into the FEED stage. A more detailed overview of how pre-FEED is defined for hydrogen projects will be provided in further publications.

Note that we would expect projects with earlier operational dates, such as 'anchor projects', to be further ahead with their FEED studies and for this to be considered as part of project evaluation.

The project execution plan must demonstrate that the project is at a sufficient stage of progression in acquiring planning approvals and permit consents such that aligns with their delivery timelines. This will include the expiration of any challenge period for the consents. We reserve the right to delay or prevent entry into a contract where a valid challenge has been brought within the relevant time-period.

Expected to be operational by no later than the end of December 2027

This criterion has been proposed to align with government's commitment to deploy CCUS in the UK in the 2020s, with at least two cluster by the mid-2020s. Note that this is intended as a backstop date; having an earlier operational date will count favourably towards the project at evaluation stage. Note, projects with a later operational date than this can still be included on the Cluster Plan submitted in Phase-1 but would only be evaluated as part of the Phase-1 assessment.

Has identified an off-taker or multiple off-takers

Hydrogen producers looking to apply for support will need to have identified off-takers for their hydrogen. This is to give assurance that the project is sufficiently developed in concept and viable if it were to receive funding. To demonstrate this, projects will be expected to have either a letter of intent or MOU between the producer and its off-taker(s), as well details in the project execution plan. At the evaluation phase further checks will be done on the robustness of the off-taker and any off-taker agreements. For this Phase-2 process, all uses of hydrogen that lead to a reduction in carbon emissions will be counted as a valid off-taker.

It is noted that under current health and safety regulations (the Gas Safety (Management) Regulations 1996 (GSMR)), the amount of hydrogen allowed in the existing gas network is no greater than 0.1% by volume. For a greater amount, say, up to 20% by volume for blending of hydrogen, this would require HSE to grant an exemption to the existing hydrogen limit. Such an exemption would only be granted if it was shown the health and safety of people likely to be affected by the exemption would not be prejudiced in consequence of it. HSE is currently considering how a review of GSMR can be taken forward which would allow the existing hydrogen limit to be amended to allow for, say 20% hydrogen blend.

Any such change would, of course, have to be safe, with the safety evidence being presented to HSE for assessment before any change could be made to the regulations (earliest 2023) and be accompanied by a completed BEIS value for money case, followed by necessary legal and regulatory change. Hydrogen producers planning to blend hydrogen into the existing gas network are still able to apply for support through this Phase-2 process. However, any financial support allocated through this process would be subject to the necessary policy decisions and regulatory changes required for the proposed hydrogen and natural gas blend into the existing gas network. An expected decision on whether to blend into the existing gas network or not is expected to take place earliest by Q4 2023. However, this decision may extend beyond this date.

Assessment and allocation

Work on the hydrogen business model is progressing at pace but the model is currently less developed than the equivalent carbon capture business models for power and industry. We will be consulting on the government's preferred hydrogen business models shortly. Therefore, allocation method and criteria have not been decided yet, but the process will be open to those hydrogen projects included within the Cluster Plan and any potential new hydrogen projects within, or that could feasibly connect to, the successful Track-1 clusters as part of the Phase-2 process. We will also consider hydrogen projects that could feasibly access other CO₂ storage solution by the 2027 operational date.

Hydrogen Business Model update

The Hydrogen Business Model is being developed to provide a form of revenue support to overcome the existing cost challenge of producing and buying low carbon hydrogen against cheaper high carbon counterfactual fuels, such as natural gas. After exploring a number of producer and end user support mechanisms, we believe that a producer side subsidy combined with demand side incentives would be the most efficient way to stimulate hydrogen production and provide reasonable surety of returns for investors.

Our current view for the producer subsidy is that a contractual framework would be more appropriate than a regulatory framework, recognising the asset life of hydrogen production assets, the likely investor profile, and our long-term aim of a subsidy-free market for low carbon hydrogen. As such, the business model will provide revenue support over an agreed contract term, incorporating a proportion of operational costs (taking into account a CO₂ T&S fee) and an appropriate rate of return on capital invested. The Business Model will also set out the proposed risk allocation framework between government and the private sector.

For demand side incentives, we continue to work with existing government policy areas to explore what adaptations to policies and regulations are required, and any additional mechanisms to support different end use sectors.

Further details on the revenue mechanism to fund the Hydrogen Business Models and provide the certainty investor needs will be set out in 2021.

4.6 BECCS

BECCS business models are at an earlier stage than Power, Industry, Hydrogen and T&S.

Our long-term approach to BECCS, and GGRs more widely, is to have a technology-neutral market driven, competitive framework. However, we also recognise that there are near term opportunities for BECCS that, if deemed sufficiently valuable, could require support ahead of that framework being in place.

For example, recognising that the Dispatchable Power Agreement is not designed to value the negative emissions of BECCS projects in the power sector, in January 2021 we established an independent investigation into potential commercial frameworks that could meet this need. The investigation is ongoing, and we will publish a final report later this year. The report will provide specific advice on how to structure a commercial framework that meets typical criteria, such as ensuring that 'value for money' is achieved, as well as:

- Incentivising operators to continually reduce supply chain carbon intensity.
- Only rewarding verified negative emissions, rather than simply stored carbon.
- To be feasible to implement in the 2020s, using existing frameworks where possible.

As this work has not completed we will provide an update on our approach to BECCS later this year. Any decision to award support would only be made subject to the successful completion of any negotiation and due diligence, taking into account a value for money assessment.

Whilst DACCS projects are not at the same stage of development as BECCS projects in the UK, we recognise that engineered GGRs feeding into CO₂ T&S networks may need to be considered as part of the CCUS Cluster Sequencing process in the future.

This publication is available from: www.gov.uk/government/publications/cluster-sequencing-for-carbon-capture-usage-and-storage-ccus-deployment-phase-1-expressions-of-interest

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