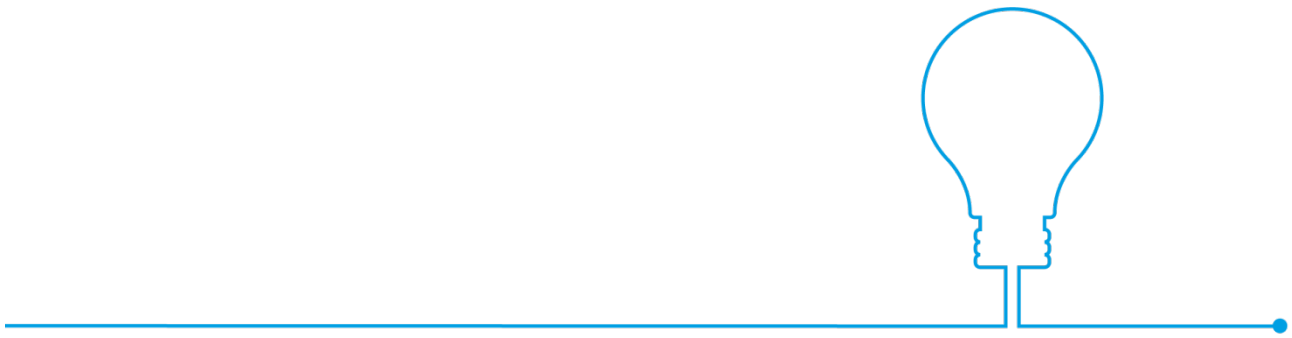
Department for
Business, Energy
& Industrial Strategy

CALL FOR CARBON CAPTURE & UTILISATION DEMONSTRATION PROGRAMME (CCUD), PHASE 2 - FEED STUDY

Guidance Notes



August 2018

CALL FOR CCUD, PHASE 2 - FEED STUDY

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Call for CCUD, Phase 2 - FEED Study

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

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Part 1: Call for CCUD, Phase 2 - FEED Study – Summary

1. Background

The Clean Growth Strategy[1] highlights the value of the UK deploying carbon capture, utilisation and storage from 2030. There is a broad international consensus that Carbon Capture, Utilisation & Storage (CCUS) has a vital future role in reducing emissions. This could be across a wide range of activities such as producing lower-emission power, decarbonising industry where fossil fuels are used and/or industrial processes as well as providing a decarbonised production method for hydrogen which can be used in heating, industry and transport. This makes CCUS a potentially large global economic opportunity for the UK. The International Energy Agency estimates there will be a global CCUS market worth over £100 billion - with even a modest share of this global market, UK GVA could increase to between £5 billion and £9 billion per year by 2030.

However, the current technology is expensive and there are only 21 large-scale plants operating, or in construction, across the world – of which 16 rely on revenue from providing carbon dioxide for enhanced oil recovery.

While we have explored ways to deploy CCUS at scale in the UK since 2007, the lack of a technological breakthrough to reduce the cost of CCUS and the cost structures and risk sharing that potential large-scale projects have demanded has been too high a price for consumers and taxpayers. It is clear from the relative lack of deployment of the technology that other governments have reached a similar conclusion.

The cost of carbon capture is a key element of CCUS, making up for example approximately 35% of the cost of deploying CCUS in the power sector, see figure 1.

[1] REFERENCE CGS

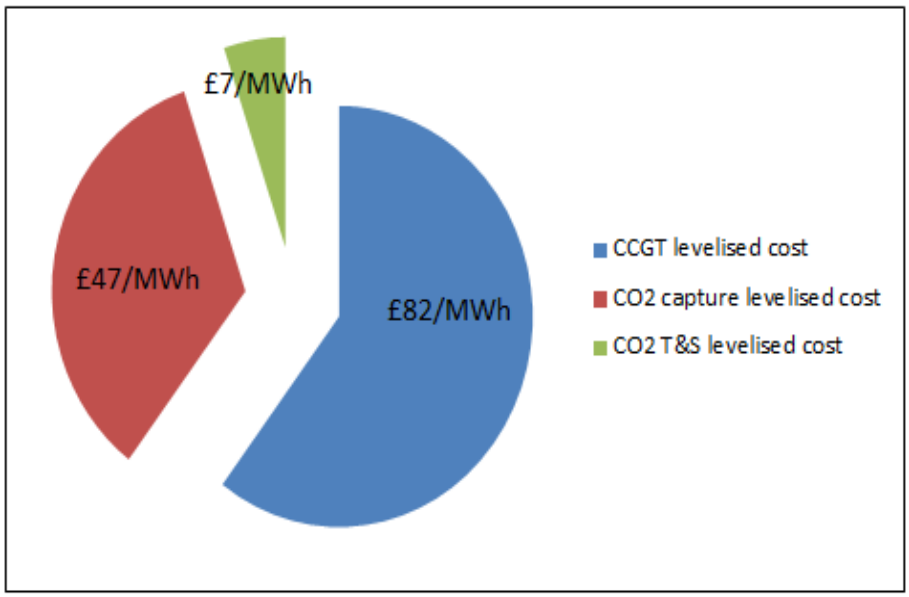


Figure 1: Levelised cost of gas-fired power production with post combustion capture for a project commissioning in 2025[2]

To encourage early learning and cost reduction, capture technology can potentially be deployed commercially at an intermediate scale (approx. 30,000-70,000 tonnes of CO_2 a year). At this scale the CO_2 can be commercially utilised for industrial processes, allowing for example, the cost of demonstrating the technology to be partially funded by the host site having to pay less for the CO_2 they currently use. BEIS believes the price range for purchasing tens of thousands of tonnes of food-grade CO_2 is between £80-120 per tonne of liquid CO_2[3].

The early demonstration of carbon capture on these first projects will begin learning about the optimal way to configure the plants and will provide crucial operational data on performance and degradation. These plants will act as the "lead unit" for the demonstration of the technology, providing tens of thousands of hours operation. By de-risking the technology at this scale, this will encourage the technology to be used in similar projects in the UK and internationally. This could generate a pipeline of projects where novel configurations, processes, materials and technology act as an early market pull to accelerate carbon capture technology development and the development of a CO_2 utilisation market in the UK. **The focus on capture technologies, in the CCU programme, are for those that can be developed, scaled and eventually used for large "mega-scale" (>1Mtpa CO_2) CCUS projects**.

[2] Figures from Electricity Generation Costs, Department for Business, Energy & Industrial Strategy, November 2016. Please note this example is illustrative as the cost estimate is based on evidence provided by Leigh Fisher in 2015, and BEIS has done further work with Wood Plc. in the study "*Assessing the cost reduction potential and competitiveness of novel UK carbon capture technology*".

[3] Price range provided to BEIS by a selection of industrial sources

CO_2 utilisation is an evolving subject in the UK and internationally, by establishing more carbon capture at UK industrial sites this should improve BEIS' and Industry's understanding of the opportunities for further CCU in the UK.

It is for this purpose that BEIS has allocated up to £20m of the £100m funds allocated for Industry and CCUS Innovation to fund the design, construction and demonstration of Carbon Capture and Utilisation in the UK. The **CCU Demonstration Programme (CCUD), announced in the Clean Growth Strategy,** is divided into three phases:

- **Phase 1:** a 6 month Scoping Study, carried out by a third-party engineering supplier in collaboration with participating companies that wish to capture and/or utilise the CO_2, or provide the necessary equipment. The supplier has produced site-specific design estimates for deploying CCU technology to a cost accuracy of at least ±30%.
- The design estimates will be used to allow BEIS and the project developers to confidently determine if the CCU projects should progress to a design (Feed) study (**Phase 2**); and
- Ultimately construction and demonstration of up to three CCU projects (**Phase 3**);
- Phase 2 & 3 will provide grant-funding[4] for project applicants to complete design and construction respectively. Companies wishing to apply for funding for Phase 2 and 3 will be expected to have carried out a feasibility study either by participating in Phase 1 or to have carried out the feasibility study themselves.

[3] Price range provided to BEIS by a selection of industrial sources

1. **Overview of Phase 2 FEED Study Call**

This is a £5 million BEIS Call for Phase 2 Front End Engineering Design (FEED Studies) as part of the £20 million CCUD Innovation programme. Phase 2 will provide grant funding for a number of FEED studies. Each FEED Study will relate to a specific site (the 'host site'). Each FEED will produce costs estimates for the construction and operation of demonstrating CCU at the host site. The cost estimates are expected to produce cost accuracy of ±15% to allow BEIS and the developer to make a final investment decision on whether to proceed to demonstration (Phase 3).

The Call is open for all sizes of organisation and will provide grant funding for projects of 6-9 months in duration. All Phase 2 projects must complete before November 2019. Projects can involve working with international partners, but the work funded must be predominantly conducted in the UK.

BEIS will fund project proposals that meet the definition of Feasibility Study under the European Union General Block Exemption (GEBR) for State Aid. Grants of up to £1m will be issued under Article 25 of the GBER;

1.1 Definition of Feasibility Study

Feasibility Study is defined as 'the evaluation and analysis of the potential of a project, which aims at supporting the process of decision-making by objectively and rationally uncovering its strengths and weaknesses, opportunities and threats, as well as identifying the resources required to carry it through and ultimately its prospects for success.'

1.2 Definition of FEED Study

"Front End Engineering Design (FEED) is defined as the basic engineering which comes after the Conceptual design or Feasibility study. The FEED study focuses on the technical requirements as well as detailed investment cost for the project. A good FEED will reflect all the clients project specific requirements and avoid significant changes during the execution phase."

1.3 Definition of CCU technology

Carbon capture and utilisation is a way of using carbon as a raw material in industrial processes, such as manufacturing building components and chemicals. CO_2 utilisation delays carbon emissions to the atmosphere while reducing the consumption of the original feedstock and avoiding the emission of other substances associated to them. Some CCU technologies are already quite developed and could be scaled up in the foreseeable future to the industrial scale; others are still in the lab or pilot scale.

The CO_2, as source of carbon, has the potential to be used in the manufacture of fuels, carbonates, polymers and chemicals. Being on development-to-demonstration phases, CCU represents a new economy for CO_2, when used as raw material.

To be supported, CCU Projects must meet the following criteria

- CO_2 is produced as the bi-product of an existing industrial process and is currently released into the atmosphere
- Size of the capture capacity is between 30,000 – 70,000 tonnes of CO_2 per year
- The projects must be largely conducted in the UK
- To have a proven economic case, which implies that you will have a relatively high concentration of CO_2, low-cost utilities, and close to potential sales outlets.

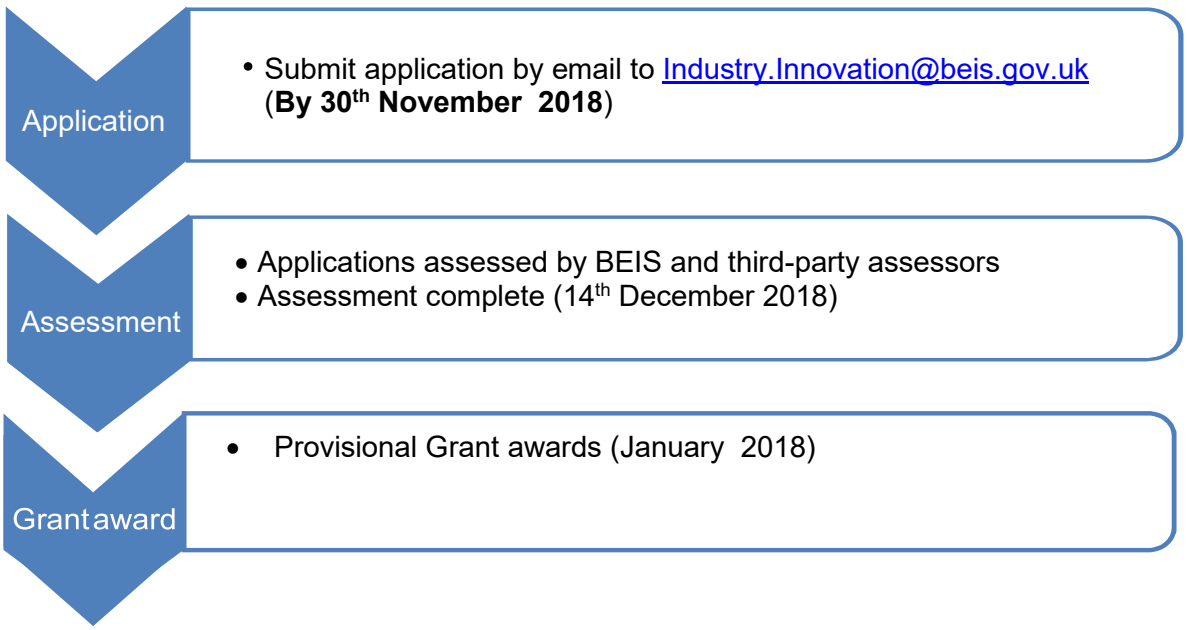
1.4 Minimum Outputs required from each FEED

Each FEED Project proposal supported *must* provide the following specific outputs

- A control cost estimate to AACE Class IV, with the accuracy of +/-15%.
- An Environmental Impact assessment, to conduct geotechnical assessment for the proposed site along with the quotations for major equipment.
- An execution plan for delivering the FEED, including the overall schedule, estimating methodology, list of deliverables and risk mitigation plan.

2. Application and Assessment Process

Call for CCUD, Phase 2 - FEED Study timings: Launch 7th September 2018



As outlined in the diagram above, the competition process will be undertaken in three key stages comprising application, assessment and grant award.

Stage 1: Application

- Applicants are invited to submit project applications by **30th November 2018**, these must be electronic and be sent to Industry.Innovation@beis.gov.uk. The email subject line must begin 'Call for CCUD, Phase 2 - FEED Study Application'.

- The application documents are:

    - Application form
    - Finance form (one per project application)
    - Gantt chart
    - Letters of support from collaborators/partners (where relevant)

- BEIS will accept additional supporting information in the form of further annexes, however you should not assume that any additional information will be reviewed as part of the selection process and your application should not rely on information cross-referenced within annexes.

- If you have any other questions about the CCUD call, these should be sent by e-mail to Industry.Innovation@beis.gov.uk by **21st September 2018**. To ensure an open and transparent competition answers to questions will be added to our FAQs. These will be republished including all questions asked on **28th September 2018**.

Stage 2: BEIS Assessment

Applications will be initially checked according to Eligibility Criteria detailed in section 3.

N.B. Applications which fail the Eligibility Criteria will not be assessed further, so it is essential to ensure that your project meets these before you submit your application.

Applications which meet the Eligibility Criteria will then be assessed against the Assessment Criteria detailed in section 7. The assessment will be done by assessors from BEIS and a third-party contractor.

All applicants will receive a short summary of key feedback regarding their applications irrespective of whether they are successful or not. BEIS aims to have provided all feedback to applicants within two months of the final funding decision. However, applicants are asked to remember that BEIS may receive a significant number of applications and the timing of the release of feedback will be at BEIS's discretion.

Stage 3: Grant Awards

Successful applicants will be notified via email that they have been provisionally awarded a grant, and a provisional grant offer letter will be provided. An inception meeting will be set up with the applicant and a BEIS official to explain the conditions of the letter, respond to any queries which the applicant may have at this stage and to agree the milestone schedule.

N.B. Successful applicants have only received provisional approval for a grant, until successful completion of the inception meeting. BEIS will also need to carry out due diligence checks on all parties proposing to carry out Grant activity.

On satisfactory completion of the Inception Meeting, the conditions agreed, completion of due diligence checks and signing of the grant offer letter, the project can begin.

3. Eligibility for funding

To be eligible for funding, proposed projects must meet all of the following criteria:

1. **EU General Block Exemption:** Projects must fall within the EU General Block Exemption Regulation (GBER) Article 2 definitions of feasibility study (87) and be eligible under, Section 4 Article 25 (Aid for research and development projects).

2. **Aid Intensity including cumulation**: The funding levels applied for must be consistent with the appropriate Block Exemption aid intensity levels (including consideration of the cumulative effect of other forms of state aid) and costs must be consistent with the eligible cost criteria (as set out in Appendix 1).

3. **Match-funding**: Given the aid intensity rules, applicants will need to have private funding in place to cover the balance of the eligible costs. Such funding may come from a company's own resources or external private sector investors but may not include funding attributable to any public authority or EU institution. The match funding must be at least 30% of the total project costs. The maximum amounts of aid towards eligible Project Costs are set out within Table 1 below. Match-funding must be provided as cash. Contributions 'in kind' cannot be considered match-funding.

4. **Project Location:** The host site being considered in the FEED study must be located in the UK.

5. **Grant size:** Applicant(s) to the scheme will be eligible to receive up to £1m for funding a project under Article 25

   Since BEIS is seeking to maximise the impact of government funding, projects looking for public funding intensities that are lower than the applicable maximum are likely to score higher in the appraisal process.

6. **Technology scope:** The project must focus on conducting a FEED study on applying Carbon Capture and Utilisation technology to a UK host site.

7. **Project duration:** Projects are planned to run between 6-9 months.

4.1 General conditions:

We welcome proposals from individual organisations and proposals from consortia (a consortium may consist of Industry and a technology provider; either Business to Business or between Business and research organisations)

Companies of any size are eligible to seek funding.

Applicants who have been successful or unsuccessful under other BEIS grant schemes may apply for funding under the CCUD, Phase 2 - FEED Study call and they will neither be advantaged nor disadvantaged by their previous applications.

5. Funding Levels and State aid requirements

This scheme operates under the EU General Block Exemption Regulation, Article 25 ('Aid for research and development projects').

The size and type of funding that the project can receive will depend upon the type of applicant. These can broadly be defined as "small, medium and large enterprises" (as defined by the EC).

5.1 Research and Development Funding

The scheme is open to:

These applicant(s) to the scheme will be eligible to receive up to £1m for funding a project under Article 25[5]. The maximum percentage of public funding that can be provided for the project is summarised below in Table 1.

Table 1: Maximum public funding for projects

Research Category	Size of Enterprise	Maximum amount of aid towards eligible Project Costs
Feasibility Studies	Small	70%
	Medium	60%
	Large	50%

[5] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0651&from=EN

The figures represent the maximum aid intensity that BEIS will provide under the 2018 Call for CCUD, Phase 2 - FEED Study. State Aid compliance is a legal requirement and the risk of non-compliance rests with the grant recipient[6]. It is therefore crucial that you address State Aid fully within the application, as any errors at this stage may result in BEIS being able only to offer a reduced level of funding. BEIS is seeking value for money from its funding and proposals that demonstrate matched funding greater than minimum requirement will be looked on favourably.

Collaborative Bid: You must also submit a copy of the Heads of Terms for your collaboration agreement. This will form part of the assessment process and BEIS will review it to ensure that proposed collaborations are viable and robust.

NB: Applying under Article 25; you will be required to demonstrate that your project falls within the definition of feasibility study, as set out earlier.

5.2 Public funding

When considering levels of aid intensity (described above), public funding includes the grant and all other funding from, or which is attributable to, other government departments, UK public bodies, other Member States or the EU institutions. Such funding includes grants or other subsidies made available by those bodies or their agents or intermediaries (such as grant funded bodies).

In applying to this Call you must state if you are applying for, or expect to receive, any funding for your project from public authorities (in the UK or in other Member States) or the EU or its agencies. Any other public funding will be cumulated with BEIS funding to ensure that the public funding limit and the aid intensity levels are not exceeded for the project.

Whilst BEIS will check the information provided to try and ensure that applicants meet the requirements of State Aid, applicants should establish that they fall within the state aid rules before submitting applications. BEIS requires applicants to notify them of any change to situation or circumstance during the project.

If there is a breach of State aid regulations, for whatever reason, the European Commission requires repayment of any grant received, including interest, above that which was due. In this situation, applicants will be required to repay any funding received. It is also important to ensure that the total grant funding for the project from public sources (including from the European Commission) does not exceed the permitted percentages stated for the relevant Article.

As part of the assessment process, the added value and additionality of public funding will be tested. Applicants will need to demonstrate why public funding is required to deliver this project.

[6] The UK's rights and obligations of EU membership, including compliance with State aid rules, continue to apply until the UK's exit from the EU has been completed, and therefore for this competition.

6. Project Plans, Finances and Financial Viability

6.1 Project Plans

Projects are expected to run between 6-9 months in duration. All projects must be financially complete by November 2019. All projects must submit a detailed Gantt chart (or equivalent) as part of their application, which details the project timeline, the various work packages and the project milestones.

6.2 Project Costs

All applicants must complete the 2018 Call for CCUD Finance Form detailing their expected expenditure and spending profile for the project on a monthly basis. Further details about this form are in Part 2 of this document. You should complete a single finance form covering your entire project and including all your partners, clearly identifying which costs relate to which partner. Multiple Finance Forms will not be accepted and will result in failing the Eligibility Criteria.

During the assessment of applications, the project costs and plans that are submitted as part of the application process will be fully assessed along with the answers to the questions on the application form to ensure they are what might be reasonably expected.

The eligibility of all costs under state aid rules and the financial viability of your organisation will be checked following the decision to pre-select an applicant but before a formal offer is made. Being contacted for this information does not indicate either success or failure in the assessment process.

BEIS understands that project costs are subject to change prior to agreeing a Grant Offer Letter and throughout the course of the project, and we will therefore review the project budget with a view to producing a final version to be included in the Grant Offer Letter.

BEIS generally does not accept contributions in kind as match funding, as these are ascribed a notional cost. However, where money changes hands (e.g. for the time of managers or experts who are paid by yourselves or another partner) this would not be considered as in-kind match funding.

6.3 Financial viability checks

BEIS will undertake financial viability checks on all successful applicants. These will include looking at the latest independently audited accounts filed on the Companies House database.

Where a business is not required to file accounts with Companies House, other financial information may be requested to enable an appropriate financial viability review to be undertaken. We will be looking for evidence of your ability to resource the project appropriately, so the information we request will be focused on understanding how your business operates in this respect.

Before your project starts, BEIS will ask for evidence that you have the funding mechanisms in place to manage your cash flow across the life of your project. This could include letters of credit or other such mechanisms. We do not expect you to have cash deposits to cover the entirety of your project at the start. If you do not complete your project due to cash flow problems that you could have anticipated and managed, we may request repayment of any grant already issued to you.

BEIS will not make payments in advance of need. BEIS understands, however, the difficulties which small businesses may face when financing this type of project. BEIS will explore cash flow issues with the applicant as part of developing the financial and milestone profile within the Grant Offer Letter. BEIS will offer flexibility in terms of profiles and payments, within the confines of the requirements for use of public money within which it operates.

6.4 Grant Use

Grants provided will only cover eligible costs within the meaning of Article 25 of the General Block Exemption Regulation. Companies should note that the grant may not be used to subsidise commercial activities and that where BEIS awards a grant for the purpose of the development of commercially usable prototypes or pilot projects, any revenue generated from such commercial use will be deducted from the grant (and, where the grant has already been paid, will be required to be returned to BEIS).

7. Assessment Process and Selection Criteria

All applications will be considered against the assessment areas and ranked against each other.

The application form and guidance notes are designed to inform you about the types of information you should provide to BEIS for your proposal to be assessed.

For the avoidance of doubt, the individual questions listed under the headings below do not constitute assessment sub-criteria but are an indication of the kinds of factors that will be considered in assessing each aspect of a proposal.

The highest scoring applications will proceed to the Grant Offer Letter stage. BEIS may offer a grant to the highest scoring projects, that is of lower value than applied for, if this will enable a greater number of projects to be supported under the Call. We will select projects that offer the best value for money taking account of the following areas:

1. Project Motivation

– Questions **10%**

a) What are your main aims and expectations for involvement in the CCU Demonstration Programme? How does this programme fit with future business plans?

b) Describe what work has been done to date.

c) Where will investment funding for the project come from during Phase 2 and Phase 3? What level of support is required from BEIS at each stage to ensure the viability of your development?

2. Project Structure and Parties Involved

– Questions **15%**

a) Provide an organisation chart and a description of the main parties involved in the project. Where appropriate, this should include the site owner, technology provider, engineering contractor, plant operator, and where applicable purchaser for the CO_2. Please also specify which specific personnel will be responsible for delivering the project, managing the interfaces between organisations and providing accountability to BEIS under the programme? Describe the nature of the relationships between the parties.

b) What is the specific process technology proposed for removal of carbon dioxide from the process stream? Describe the scale, period of operation and source of CO_2 for existing installations using this technology? What limitations to plant capacity / train size exist for this technology?

c) How will the carbon dioxide be used? Provide details of the destination, product specification, means of transportation and expected sales value per ton of CO_2.

d) How will the FEED study be completed, what roles and responsibilities will the main parties fulfill, will work be subcontracted to a third-party contractor?

3. Engineering Definition

– Questions **30%**

a) Provide a description of the base industrial process that the carbon capture plant will be applied to and the system to be installed. Include a block flow diagram or overall schematic of the facility.

b) Provide a material balance for the new facilities clearly showing flow rates, composition and operating conditions for key streams, plus any utility and electrical power demands. How much carbon dioxide will be captured from the process (both as a proportion of the total CO_2 in the feed stream, and as an annual mass of CO_2 product from the process)?

c) Provide a sized equipment list for new or modified equipment. Indicate any equipment items that are considered to be specialised or proprietary in nature.

d) Provide a plot layout, clearly showing connections to existing systems, such as utilities and power. Indicate how construction and operational traffic will access the facility.

e) How will the proposed plant impact the safety and health of on-site personnel and the general public? What positive and negative impacts are anticipated for the local environment? Provide details of any hazard assessments or COMAH updates completed.

f) What discussions have been held with external stakeholders, such as the Environment Agency and Local Authority? What approvals do you require for installation of the carbon capture and utilisation plant?

4. Project Economics

– Questions **25%**

a) Provide a capital cost estimate to AACE Class IV or equivalent. The estimate should be broken down to show costs for equipment items, bulk materials, engineering, construction contracts, land costs and owner costs. Please confirm the capital cost estimate accuracy.

b) Provide fixed and variable operating costs, including the number of additional personnel required, and costs for utilities and services.

c) Provide an economic assessment, showing the planned period of operation, costs, sales value and project IRR.

5. Project schedule and risk

– Questions **10%**

a) Provide a schedule for implementation of the project, including pre-FEED / FEED activities, any key internal milestones / decision gates, and approval gates for external

agencies. b) Please include an illustrative schedule for how Phase 3 might be implemented, including activities, milestones and timing c) What main risks exist for the project and how does Bidder intend to manage these? Please complete a project risk register.
6. Project finances **– Questions** **10%**
a) Please provide finance form for your proposed project complete the 2018 Call for CCUD Phase 2 Finance Form and use this section to explain the proposed costs of your project. b) Please describe and explain the costs of your project c) Justify how the proposed costs represent fair market value and the total budget repreents good value for money.

8. Notification

Applicants will be informed by email whether their application has been successful (or unsuccessful), subject to compliance with the terms and conditions of the Conditional Offer that will be received and successful completion of the inception meeting.

BEIS may wish to publicise the results of the scheme which would include engagement with the media. At the end of the application and assessment process, BEIS may issue a press release or publish a notice on its website. These may, for example, outline the overall results of competitions and describe some of the projects to be funded.

Some organisations may want their activities to remain confidential and you will be given a chance to opt out of any involvement in media relations activity and further case study coverage of projects, should you see this as being absolutely necessary. However, the public description of the project you provide in your application will be made available in the public domain if your application is successful, and you are not able to opt out of the project description being published.

Any organisation that wishes to publicise its project, at any stage, must contact the Project Manager of the CCUD Call at BEIS via email or a formal letter before doing so.

9. Feedback, re-application and right of appeal

A short summary of key feedback regarding the applications will be provided to all applicants, this feedback will be based on the summary comments of the Assessors. No

additional feedback will be provided and there will be no further discussion on the application.

The feedback from the assessors is intended to be constructive. Comments are not a check list of points which must be answered or argued in a resubmitted application as the assessors may be different and it is your decision as to whether you act on the suggestions made. For the avoidance of doubt, BEIS & the assessors decision is final and there is no right of appeal and or re-application allowed.

10. Confidentiality and Freedom of Information

Where any request is made to BEIS under the Freedom of Information Act 2000 ("FOIA") for the release of information relating to any project or applicant, which would otherwise be reasonably regarded as confidential information, then BEIS will notify you of the request as soon as we become aware of it. An applicant must acknowledge that any lists or schedules provided by it outlining information it deems confidential or commercially sensitive are of indicative value only and that BEIS may nevertheless be obliged to disclose information which the applicant considers confidential.

As part of the application process all applicants are asked to submit a public description of the project. This should be a public facing form of words that adequately describes the project but that does not disclose any information that may impact on Intellectual Property (IP), is confidential or commercially sensitive. The titles of successful projects, names of organisations, amounts awarded and the description of the project may be published once the award is confirmed as final.

All assessors used during the assessment of applications will be subject to a confidentiality agreement.

11. Questions

If you have any questions about the CCUD call, these should be sent by e-mail to Industry.Innovation@beis.gov.uk by **21st September 2018**. To ensure an open and transparent competition answers to questions will be published including all questions asked on **28th September 2018**.

Please note, we are unable to enter into detailed discussions about individual project ideas.

Part 2 - Completion of the Application and Finance Forms

1. Completion of the Application Form

This section aims to guide you through the completion of the 2018 Call for CCUD, Phase 2 - FEED Study Application Form. It is important that a response is provided to every question. This guidance is intended to explain what type of information applicants should consider providing to BEIS to best demonstrate the merit of their application.

Applications will be judged based on the information provided in the application form and any supporting information provided. Although questions relating to the call can be asked via e-mail and by **21st September 2018**. There will not be the opportunity to enter into discussion about your project with the assessors or BEIS. These guidance notes are not intended to be exhaustive; applicants are expected to develop their own responses based on your own skills, knowledge and experience. You are encouraged to be concise and to the point whilst providing all the necessary and relevant information.

Throughout the form there are grey boxes, in order to answer the question or provide information you should simply click on the box and begin typing or select from the drop-down menu. Questions do have character limits and when the text has reached the character limit you will not be able to add any further information and the text must be edited to fit within the character limit.

Any graphs, diagrams or supporting evidence that you are providing to support your application should be attached to your submission.

1.1 Summary Information, Contact Details and Business Information

The initial section of the application asks you to provide details about your organisation.

Section/Field	Guidance
Summary Information	
Names of business	Provide the name of the lead applicant business
Project Title	A brief title that can be used to summarise the project
Estimated start date	Select the month you would propose to start work assuming successful funding
Project duration	Enter the expected duration in months, taking into consideration the maximum project length of six months
Total Project Costs	This figure should match the figure calculated in the CCUD Call Finance Form. It should be the total value of the project including all eligible costs.
Company contribution	This is the amount of total eligible project costs that you will be paying from your own resources/private sector investment into the project.

Section/Field	Guidance
BEIS Grant Applied for	This is the amount you will be asking for from BEIS. You should ensure that you do not request a grant higher than the maximum allowed, taking into account all public-sector funding for the project.
Contact Details	Name and details of the person who will be the main point of contact for the application process
Organisation Name	Provide the full registered name of the organisation applying for funding
Number of employees (including directors)	Number of staff in your organisation (this will help us confirm the nature of your company)
Turnover (in most recent annual accounts)	Please provide your most recent turnover figure from annual accounts and the date of those accounts
Balance Sheet Total (total assets net of depreciation)	Please provide your most recent balance sheet total (total assets net of depreciation) and the date of the calculation.
Does the business have a parent company?	We need to understand if there any significant shareholders in your business. The parent company details should be provided in the Parent Company details section.

Section/Field	Guidance
Which State Aid article are you applying under?	You must select one of the General Block Exemption State Aid articles from the drop-down list. For more details on the State Aid rules and requirements, see section 5 of these Guidance Notes (above). You must indicate that you comply with the financial obligation rules by providing the relevant information. N.B. You must select one of the State Aid options and adhere to its requirements or you will not pass the Eligibility Check.
If you are applying under Article 25, is this a collaborative project?	If you are applying collaboratively, please provide details of the partner organisations in the CCUS Call Partner Details Form. If you are applying as a collaboration you must also submit a copy of formal Heads of Terms agreed between all the collaborators. Prior to the issuing of a Grant Offer Letter, you will have to submit to BEIS a copy of the collaboration or joint venture agreement that you propose to work under. You should be aware that BEIS will not issue a Grant Offer Letter until they have seen, reviewed and approved a final draft of this agreement. Sub-contracting work to a third party does not classify as a collaboration.
Parent Company Details	If you have a parent company, or are more than 25% owned by another enterprise, you must provide the details of that enterprise here. The details of the relationship between

Section/Field	Guidance
	SME eligibility and linked / partner enterprises is set out in Annex 1 of the General Block Exemption Regulation.[7]

[7] See Annex 1 of the General Block Exemption Regulation: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0651&from=EN

1.2 Project Description and Company Status

This section of the application asks you to provide an initial summary of your project and company as an introduction for the assessors.

Section/Field	Guidance
Project Description and Company Status	This should be a summary description of the project and your company which should set the scene for the assessors and introduce your company and proposed project. You should use language that can be understood by people without specialist knowledge or expertise. This question is not scored but will be used by assessors to gain a high-level understanding of the project before they start their detailed assessment.

1.3 Questions and Selection Criteria & Guidance

This section focuses on the questions you are required to answer. In the section we set out the weightings as well as guidance on how to respond and what the assessor will be looking for within your answers

Section/Field	Guidance
Question 1: Project Motivation	**10%**
a) What are your main aims and expectations for involvement in the CCU Demonstration Programme? How does this programme fit within your corporate environmental future business plans?	Ensure alignment with BEIS aims and expectations. You need to show how this project either fits in with and or compliments your corporate business plans and by participating in the CCUD project what are your aims, goals and expectations for the short and longer term future.
b) Describe what work has been done to date.	Tell us about all your activities in this field to date

c) Where will investment funding for the project come from during Phase 2 and Phase 3? What level of support is required from BEIS at each stage to ensure the viability of your development?	What level of support would you need from BEIS in order to successfully complete Phase 2 and potentially Phase 3 and run a viable project. You should be able to demonstrate the level of support required from BEIS for each stage within your overall project plan
Question 2: Project Structure and Parties Involved	**15%**
a) Provide an organisation chart and a description of the main parties involved in the project. Where appropriate, this should include the site owner, technology provider, engineering contractor, plant operator, and where applicable purchaser for the CO2 . Please also specify which specific personnel will be responsible for delivering the project, managing the interfaces between organisations and providing accountability to BEIS under the programme? Describe the nature of the relationships between the parties.	Please tell us who is involved and how are they connected

b) What is the specific process technology proposed for removal of carbon dioxide from the process stream? Describe the scale, period of operation and source of CO_2 for existing installations using this technology? What limitations to plant capacity / train size exist for this technology?	You need to demonstrate that you have a thorough understanding of the technology and the scale of the project. Identify the limitations that may exist.
c) How will the carbon dioxide be used? Provide details of the destination, product specification, means of transportation and expected sales value per ton of CO2.	Have you considered how the captured CO_2 would be used? Please provide details of the product specification and details of transportation route.
d) iv How will the FEED study be completed, what roles and responsibilities will the main parties full fill, will work be subcontracted to a third-party contractor?	Please tell us who is carrying what task and how will it be done.
Question 3: Engineering Definition	**30%**
a) Provide a description of the base industrial process that the carbon capture plant will be applied to and the system to be installed. Include a block flow diagram or overall schematic of the facility.	You must be able to clearly demonstrates understanding and simplicity of concept and clearly show you have a thorough understanding of the industrial process and your proposed systems and its installation

b) Provide a material balance for the new facilities clearly showing flow rates, composition and operating conditions for key streams, plus any utility and electrical power demands. How much carbon dioxide will be captured from the process (both as a proportion of the total CO_2 in the feed stream, and as an annual mass of CO_2 product from the process)?	For the project to achieve COP21 targets, you should be targeting >90% capture. The demo plant capture scale is expected to be in the range 30 – 50 kTPA CO_2 to avoid flooding the UK market. You should demonstrate and set out the targeted flow & capture rates and the annual mass CO_2 rates your process should be able to achieve.
c) Provide a sized equipment list for new or modified equipment. Indicate any equipment items that are considered to be specialised or proprietary in nature.	You need to demonstrate a sound basis for CAPEX and provide a full asset list which should identify new and existing assets and those which require modification. You need to show which assets are specialised and or proprietary.
d) Provide a plot layout, clearly showing connections to existing systems, such as utilities and power. Indicate how construction and operational traffic will access the facility.	BEIS and the Assessors must be sure that you initial feasibility assessment has been thorough and you have a sound basis for proceeding to the next phase in the project and your application must show that the logistics of the proposed plot layout has been fully considered and you have taken into account CDM requirements and have a robust plan for the operational logistic for the proposed location.
e) How will the proposed plant impact the safety and health of on-site personnel and the general public? What positive and negative impacts are anticipated for the local environment? Provide details of any	Have HSE risks been assessed appropriately? Might possible concerns arise later that could derail the project?

hazard assessments or COMAH updates completed.	
f) What discussions have been held with external stakeholders, such as the Environment Agency and Local Authority? What approvals do you require for installation of the carbon capture and utilisation plant?	How aware are you of the approvals process and does it have a robust process for gaining the necessary approvals?
Question 4: Project Economics	**25%**
a) Provide a capital cost estimate to AACE Class IV or equivalent. The estimate should be broken down to show costs for equipment items, bulk materials, engineering, construction contracts, land costs and owner costs. Advise the capital cost estimate accuracy.	We want to be sure that the initial feasibility assessment has been thorough
b) Provide fixed and variable operating costs, including the number of additional personnel required, and costs for utilities and services.	We want to be sure that the initial feasibility assessment has been thorough
c) Provide an economic assessment, showing the planned period of operation, costs,	Is this project economically viable?

sales value and internal hurdle rate (discount rate).	
Question 5: Project Schedule and Risks	**10%**
a) Provide a schedule for implementation of the project, including pre-FEED / FEED activities, any key internal milestones / decision gates, and approval gates for external agencies.	Please provide the schedule using gant chart
b) Please include an illustrative schedule for how Phase 3 might be implemented, including activities, milestones and timing	Please ensure this is clear to read and understand
c) What main risks exist for the project and how does Bidder intend to manage these? Please complete a project risk register.	Have you considered what could go wrong? How sensitive are the economics to disturbances?

Question 6: Project Finances	**10%**
a) Please provide finance form for your proposed	Please use the finance form provided to submit the information and explain what the proposed cost is

b) Please describe and explain the cost of your project.	Please tell us how you have come to the final cost of your project, what is included.
c) Justify how the proposed costs represent fair market value and the total budget represent good value for money.	How is your proposed cost compares with the market value, and how the cost proposed represent good value for money/

2. Completion of the 2018 Call for CCUD, Phase 2 – FEED Study Finance Form

You will need to complete the financial details in the Financial Summary section of the application form and complete the 2018 Call for CCUD, Phase 2 – FEED Study Finance Form. The information in both sections should be consistent.

You should only submit one finance form for the project, which should combine the costs of all project partners. Within the finance form and the application, you should make clear how funds will be split between partners and that these splits comply with the relevant State Aid rules.

The 2018 Call for CCUD, Phase 2 – FEED Study Finance Form consists of 8 worksheets:

Summary

Labour Costs (Inc. Overhead Costs)

Materials Costs

Capital Equipment Costs

Sub Contract Costs

Travel & Subsistence Costs

Other costs

Project quarterly & Milestone costs breakdown

Each of these sheets can be accessed by using the scroll bar at the bottom of the worksheets.

Within the spread-sheet there are boxes that are shaded grey, these boxes are auto-calculating and can only be altered by changing data in the manual entry boxes. All white boxes are manual entry boxes into which data can be input.

Guidance on eligible costs is provided in Appendix 1 of these guidance notes.

Guidance on what needs to be entered in some fields is provided within the sheet when you click on the box.

Worksheets only need to be completed if you have costs in those categories, so for example, if your project has no planned capital equipment or sub-contract costs, the form will assume these entries are £0 and calculate without them.

2.1 Project Quarterly & Milestone Breakdown Worksheet

This worksheet provides the breakdown of all costs across the duration of the project. It represents the spending profile you expect for your project. In entering this information, you should ensure that the profile is consistent with the timings of the various work packages you are proposing within the project plan.

You must ensure that the total, in the spreadsheet, for each category matches the total that has been calculated on the individual worksheets.

Appendix 1 – Eligible Costs

In addition to the requirements of the EU Block Exemption Regulation, BEIS will only provide the grant to cover eligible costs incurred and defrayed in the period between acceptance of the BEIS grant and the deadline specified in the grant offer letter for completion of the project.

The definition of eligible costs includes the applicant's own costs, eligible costs incurred by consortium members and eligible costs incurred by companies connected to any of these. The cost of work contracted to connected companies, to consortium members or to companies connected to consortium members should be on the basis of eligible costs.

Costs must be denominated in GB pounds. Applicants should indicate where conversion has been made to GB pounds from other currencies and indicate the rate and assumptions used.

List of Eligible Costs

Under Article 25 of the EU Block Exemption Regulation[8], eligible cost for feasibility studies shall be the costs of the study.

List of Ineligible Costs

Under no circumstances can the grant be claimed or used:

For activities of a political or exclusively religious nature;

In respect of costs reimbursed or to be reimbursed by funding from other public authorities or from the private sector;

[8] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0651&from=EN

In connection with the receipt of contributions in kind[9] (a contribution in goods or services as opposed to money);

To cover interest payments (including service charge payments for finance leases);

For the giving of gifts to individuals, other than promotional items with a value no more than £10 a year to any one individual;

For entertaining (entertaining for this purpose means anything that would be a taxable benefit to the person being entertained, according to current UK tax regulations);

To pay statutory fines, criminal fines or penalties; or

In respect of VAT that you able to claim from HM Revenue and Customs.

Staff Costs

BEIS would not normally expect to see contractors in key posts, e.g. CEO, FD, etc. Exceptionally, where BEIS is willing to fund a project which includes contractors in key posts, the day rate attributable to the project must be agreed with BEIS at the outset and cannot be varied without written agreement.

[9] BEIS generally doesn't accept contributions in kind as match funding, as these are ascribed a notional cost. However, where money changes hands (e.g. for the time of managers or experts who are paid by yourselves or another partner) this would not be considered as in-kind match funding.

Appendix 2 – Technology Readiness Levels (TRLs)

Technology Readiness Levels are an indication of the maturity stage of development of particular technology on its way to being developed for a particular application or product. Below are some broad definitions of the TRLs

Fundamental Research (guideline)	
TRL 1 – Basic Research	Scientific research begins to be translated into applied research and development.
TRL 2 – Applied Research	Basic physical principles are observed, practical applications of those characteristics can be 'invented' or identified. At this level, the application is still speculative: there is not experimental proof or detailed analysis to support the conjecture.
Industrial Research (guideline)	
TRL 3 – Proof of technical concept	Experimental proof of critical technical functions and validation of feasibility for application. Active research and development is initiated. This includes analytical studies and laboratory studies to physically validate analytical predictions of separate elements of the technology. Examples include showing the performance of critical technical features or components are feasible (even if not yet integrated or representative of real-life environment). This stage is beyond “discovery science” (TRL1) and applied research (TRL2) and investigates a novel technological or scientific advance with some category of application in mind. The scientific principles of the novel or innovative aspect are already characterised with hard experimental data

	points that enable prediction of performance, but the science is not necessarily in the final engineered format. In this stage, analytical and experimental studies measure parameters of interest, characterise properties and performance, and validate the theoretical predictions. For example, with new materials or combinations of materials, a range of formulations or combinations may be tested to explore the boundaries of performance and to select a combination with the necessary properties for commercial exploitation. System components are not yet fully integrated e.g. the lab demonstration of a new photovoltaic material may show desired properties in a controlled atmosphere but applications will require a suitable encapsulation method. Technology principles may be demonstrated in computer models and computer simulated environments where appropriate. A key output from this stage is to identify how results differ from the expected or necessary performance for future applications and where improvement is necessary.
TRL 4 – Lab and Test Bench Demonstrations	Lab and Test Bench Demos of sub-systems & key components. Modelling & experimentation with parameters representing future conditions. Application proof-of-concept Application proof-of-concept. Modelling and experimentation with data or parameters that represent future conditions (cf. TRL4). "Bench" demonstrators' show that the core technology components or subsystems based on the lab research could be engineered in practice, behave as predicted, and results indicate that the performance needed for a future application is achievable albeit with further optimisation. Bench demonstrations may focus on the key innovative component of the proposed system/product or demonstrate an entire system with simulated inputs or use of substitute subsystems. For large scale technologies the "bench" demonstration may be at smaller scale and would include tests of scale models in tanks and tunnels. If new manufacturing methods will be required, the feasibility of these will be investigated at this stage.
TRL 5 – Development Prototypes	The system, sub-system, components, or sub-scale units are integrated with reasonably realistic supporting elements so it can be tested in a simulated or representative environment. Critical cost assumptions are carefully investigated and the feasibility of the proposed manufacturing process is tested. A new manufacturing step may require a separate "product development" process

	for the manufacturing equipment. Prototype components and sub-systems are developed and improved to show that all the proposed technical components can provide the performance which will be required for future application (including: longevity, reliability, energy efficiency). Representative hardware and software components are tested in way that realistically simulates anticipated operating conditions or allows realistic predictions to be made. A relevant environment may be: laboratory test rigs with simulated use conditions, a controlled operational environment, or basic field tests. A test rig for new component technologies may be a version of the end-product. Intended functionality, size/form factor, and performance features are known at this stage. Successful development prototypes (components) become the basis for a demonstration prototype for full field tests.
Experimental Development (guideline)	
TRL 6 – Engineering or Demonstration Prototype	Full-scale system in representative conditions - Engineering Prototype. Representative full-scale prototype system is tested in a relevant environment. Proof-of-application. Critical cost factors and new manufacturing capability are refined at this stage e.g. use of cost effective materials, demonstration that new components can be manufactured, demonstration of any new manufacturing steps or processes. Not all secondary interfaces or user features are (necessarily) available yet. Representative prototype is demonstrated in a relevant environment to prove engineering feasibility. The component/sub-system designs selected at previous stage are validated. Demonstration prototypes are typically fitted with a range of monitoring/measurement systems and operated in real-life systems and conditions with continual adjustment to confirm or optimise performance claims. Core functionality, size/form factor, and benefits of the proposed product should all be demonstrable but not all end-user features or interfaces are necessarily available at this stage. Some third part measurement validation or tests are usually best done at this stage (particularly to validate improved performance over other technologies or to confirm any necessary certification and approvals that need to be obtained).

TRL 7 – Operational Prototype (Alpha Product)	Near or at planned operational system, requiring demonstration of an actual system prototype in an operational environment. Prototype for prolonged use at “tame” client or user site. All planned functions, interfaces integrated for monitored trials under the developer’s control. Alpha product prototypes are at or close to the proposed final product configuration which can be fully tested in an “in-house” trial in operational or client-like environments with integration to all systems or interfaces which will be experienced in-use. Alpha trials should validate in-use performance and also test the following: integration to all other relevant systems, features needed to support proposed installation and maintenance procedures, exposure to all other influences likely to be experienced in the “user-environment” etc. All the manufacturing steps will be tested at this stage and repeatable samples provided. Third party specialist tests would be done at this stage if not possible earlier. Prototypes may have minor re-designs following alpha tests but should not be subject to major re-designs if earlier stages have been completed properly. “In-house” means the developer runs and the trial and has access to the system(s) during the trial. Performance is not public but Alpha tests could be at "tame client" sites. Companies would not typically expect to sell prototypes at this stage.
TRL 8 – Production Prototype (saleable Beta product)	System Incorporated in Commercial Design - Production Prototype (or process). Development is complete, final design and feature set, limited release to appropriate number of clients, all fulfilment procedures trialled and documented. Trials under client / users control and operation. Technology is proven to work - technology design for production or roll-out is completed and qualified through test and demonstration. Development complete, final design and feature set, limited market release to appropriate number of clients, all fulfilment procedures trialled and user documentation complete. Saleable product. (cf. TRL 8 / 9) A beta or pre-production prototype is the configuration which the venture expects to sell repeatedly. These designs are finalised to a product specification and ready for repeat production. Client trial

	would validate: all the features and functions of the system perform as needed under expected conditions. A full product beta test includes trialling sales processed (to some extent by signing up "beta-clients"), delivery and installation procedures, integration and commissioning procedures, instructions for use, monitoring, support and maintenance procedures. Suppliers will provide short-runs of components or assembled product. There needs to be a sufficient number of beta-sites to validate the product or solution is repeatable and reliable. At the end of a successful beta test the company should be in a position to sell the product to a client for reliable on-going use. Repeated sales may be measured in 10's or 1000's depending on the technology and the cost of making iterations or improvements to the product design. However, by the above staged process, when the "beta" product prototype is prepared the venture has confidence that they could make repeated sales which will not require a re-call or levels of remedial support that would hamper the company's future progress.
TRL 9 – Marketable Product	Marketable Product: proven in repeated use - Product being sold in market, scaling up sales volumes. Actual application of technology is in its final form - Technology proven through successful operations.

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Department of Business, Energy and Industrial Strategy
1 Victoria Street, London SW1H 0ET
www.gov.uk/BEIS