



Department for
Business, Energy
& Industrial Strategy

BEIS Hydrogen BECCS Innovation Programme: Phase 1 Competition - Questions and Answers

4th March 2022

This is an updated version of the Q&A document originally published on 7th February 2022.

This document contains a new section (Section 1) which answers questions of material significance received after 26 January 2022.

Please note:

- This document contains a new instruction to applicants regarding the **Hydrogen BECCS Finance Form**, as outlined in Question 37: Applicants are advised to disregard the sentence in cell B7 on Tab B referring to HEI costs.
- In line with the response to Question 45, the **Competition Terms and Conditions** have been updated to no longer contain any reference to facsimile delivery of notice.

The rest of this document (*italicised*) has not been changed, other than to add section numbers to aid navigation:

- **Section 2:** *Update to the Competition Guidance Notes* outlines an update made to the Competition Guidance Notes on 7th February 2022.
- **Section 3:** *Questions submitted 12-26 January 2022* answers questions sent via email to H2BECCS@beis.gov.uk by the 12 noon deadline on 26 January 2022, following the launch of the [Hydrogen BECCS Innovation Programme Phase 1 Competition](#) on 12 January 2022.

All questions have been anonymised.



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Section 1: Questions submitted after 26th January 2022

The numbering of these questions is continued from the previous set published on 7th February 2022, which can be found in Section 3 of this document.

Category 1 – Feedstock Pre-Processing

26. I note in your presentation slides (23/11) that you state that the “competition will only support projects where the core technology being developed has not been previously operated widely or in a commercial environment”. The competition documents also refer to mechanical sorting and pelleting technologies for the fuel preparation lot, and we interpret this to mean equipment such as over band magnets, shredder, pelletiser etc. We note that such equipment is commonplace and are often deployed across multiple applications and/or sectors. Is it the case that established individual process phases could be incorporated in the proposed project so long as the whole process is innovative, (i.e., type of biogenic material processed to produce a hydrogen feedstock) and not previously operated commercially?

Answer: Please refer to Question 5 in the Q&A answering questions submitted 12-26 January 2022.

Category 2 – Gasification Components

27. For Category 2, can the scope of the section include the delivery of the feed material to the gasifier if specific modifications are required to the feed system, in order to and as a direct result of the proposed modifications to the gasifier in Category 1?

Answer: Please refer to the wording in Section 4.2 of the Competition Guidance Notes which outlines the technology scope for Category 2 innovations. Based on the limited information provided it is not possible to determine if the proposed modifications are within scope for Category 2. However, the example technology (d) may be relevant in determining whether the proposed innovation is within scope: *‘Gasifier-integrated technologies and design that prevent the formation of contaminants and enable more effective downstream processing’*. Please also review the competition’s objectives in Section 2.2, and in Section 4 where they are linked to specific categories.

28. Our proposal builds on previous research and will validate a microwave-induced plasma (MIP) gasification technology (TRL5) for cost-effective hydrogen production using biomass. My understanding is that MIP gasification is excluded from Category 3 (novel biohydrogen technologies) because the



core conversion technology is gasification, and I would like clarification regarding a submission under Category 2 (Gasification Components). We propose to demonstrate the benefits of an MIP torch array to generate a chemically reactive “plasma cloud” which will reduce the contaminant burden of syngas in the same vessel as the gasification process, and enable efficient downstream recovery of hydrogen, carbon dioxide and carbon monoxide.

Answer: You are correct that the innovation described would not be eligible within the scope of Category 3. For clarification on the exclusion of gasification technologies from Category 3, please refer to question 10 in the Q&A answering questions submitted 12-26 January 2022.

Based on the information provided, we consider the innovation described to be eligible within the scope of Category 2. In particular, it appears to align with the example technologies (b)iii) and (d) in Section 4.2 of the Competition Guidance Notes.

29. We are considering to apply to Phase 1 – Feasibility, category 2 (Gasification components) and we have one doubt about the funding eligibility for the CCS innovation which needs to be intrinsically linked to the Hydrogen BECCS innovation. Would microalgae systems be funding eligible as part of CCS innovation?

Answer: Please refer to Section 4.2 of the Competition Guidance Notes, which states that the technology scope for Category 2 is limited to components for use in Advanced Gasification Technologies. Category 2 will not support the development and demonstration of standalone carbon capture systems. This means that any Category 2 innovation that includes a carbon capture element must demonstrate that the carbon capture element is a fundamental part of the innovation design, and that the main focus of the innovation is improving syngas quality and/or upgrading for generation of hydrogen.

Category 3 – Novel Biohydrogen Technologies

30. Our technology solution is a waste to hydrogen process which involves a combination of pyrolysis and reforming: should it sit with “gasification” or pyrolysis for this application? In other words are should we aim our project at category 2 or category 3?

Answer: A pyrolysis technology solution would fall under Category 3 which is for innovations that generate hydrogen from biogenic feedstocks where the core conversion technology is not gasification.



- 31. We are currently developing our technology to produce Hydrogen and are interested in submitting an application for the above grant competition. However we are currently operating under a Moratorium, which we hope to exit in April 2022. We are concerned about our current financial situation and that it may exclude us from this competition and we would rather know the situation before investing significant time and money in submitting an application. Please can you confirm that this Moratorium will not preclude us from entering this competition and any subsequent grant award.**

Answer: BEIS is unable to offer any guarantees regarding the outcome of any eligibility and due diligence checks which will be conducted on all successful applicants prior to the award of contracts. These processes are likely to be conducted in April 2022, and may include, but not be limited to, credit checks and the detailed scrutiny of comprehensive reports resulting from said credit checks. BEIS may need to check with bidder(s) that the information within the report is correct. BEIS may also request the latest accounts and financial information from the preferred bidder(s).

Please note that BEIS expects to award contracts in May 2022, and for projects to begin work in June 2022 (see Competition Guidance Notes Section 6.1). In line with eligibility criterion 10 (see Competition Guidance Notes, Section 8.10), Phase 1 projects must be completed, and the report submitted to BEIS by 12 noon BST, 30 November 2022.

Please also note that this is not a grant competition. Projects will be supported by Small Business Research Initiative contracts.

- 32. We have had further discussions with specialist pilot plant EPC's about how they structure their bids for Phase 1 of the programme. The 'key' issue is that the amount of design effort rises very rapidly the greater the degree of cost certainty which is required at the end of Phase 1. It would appear that achieving a cost certainty tighter than +/-30% for a piece of highly specialised 'one off' pilot plant design will consume an excessively large portion of the Phase 1 budget. Would it be permissible to end Phase 1 with a capital cost estimate for Phase 2 with a tolerance of +/- 30%, PROVIDED THAT the uncertainty was covered by a contingency within the whole budget for Phase 2?**

Answer: Contingency costs are ineligible in this competition, meaning they cannot be included in the project budget submitted to BEIS (see Competition Guidance Notes, Appendix 2 (n)). However, applicants are allowed to pay for ineligible costs themselves, providing that all eligible costs associated with the project are included in the bid.

The principles of an SBRI project involve both funder (BEIS) and the applicant sharing the risks and benefits of the project. In return for provision of funding and non-financial support during demonstration activities, BEIS require the project team to fund any additional costs that arise during the project.



- 33. “Hydrogen BECCS for the purpose of this programme refers to generating hydrogen from biogenic feedstocks via gasification or other bioenergy conversion routes, combined with carbon capture and storage.”
Do we qualify if the selected feedstock is from municipal waste collections also containing fossil elements (e.g. plastics)?**

Answer: Regarding feedstock composition, applicants should provide assurance that their proposed feedstock meets the 25% minimum biogenic content requirement in line with exclusion criterion (d) (See Competition Guidance Notes, Section 4.5). Depending on the innovation, it may also be relevant to outline details of feedstock composition in relation to assessment criterion 2(b): Greenhouse gas emissions and Environmental impact (See Competition Guidance Notes, Section 7.1, and Appendix 4).
Please also refer to Question 4 in the Q&A answering questions submitted 12-26 January 2022.

Application process

- 34. Can you confirm that the correct declaration documents have been issued for this competition?**
We are running through the declaration documents ahead of submission and finding that some of the declarations are either not applicable or are requesting individual, rather than, organisational sign off.
For example, the conflict of interest form is aligned to individual sign off rather than organisation sign off. Are we required to have all individuals who have been involved in the proposal sign a form and issue all forms to BEIS?

Answer: The correct declarations have been issued. The lead organisation needs to complete the Conflict of Interest form and declare whether there are any conflicts arising from themselves or any of their partners involved in the bid.

- 35. Please can you confirm if all partners involved in the bid need to complete Declarations 1-5 and 6? Or does the lead applicant complete all 6 declarations and the collaborating partners only submit, for example, the General Data Protection Regulation assurance questionnaire (declaration 6). It seems only one document can be uploaded for each attachment.**

Answer: The Lead applicant must fill in all declarations on behalf of the consortium/partnership/project team, except for the Standard Selection Questionnaire (Declaration 4). For Part 1 and Part 2 of the Standard Selection Questionnaire every organisation that is being relied on to meet the selection must complete and submit the self-declaration, and, all sub-contractors are required to complete Part 1 and Part 2.

- 36. Are we expected to charge VAT when invoicing? As a University, we can't recover VAT on most of our business, including most research grants, though**



we can on commercial projects where we have charged VAT, so we need to know in order to cost accurately.

Answer: The decision on whether to charge BEIS VAT is something that needs to be decided by the supplier (which in this scenario is a university). In principle, charging VAT is a decision for the supplier to make. Some universities will charge VAT and others won't depending on their circumstances. Whichever is the case please do make it clear in your application.

- 37. We have encountered a problem completing the required "Hydrogen BECCS finance form". Tab B "Labour and Overheads" specifies that "Higher Educational institutions (HEI), applying as project lead organisation or within a consortium, please use 'Sheet J' & 'Sheet K' to capture Labour and Overhead costs" (See cell B7, top left corner of the tab). The problem is that Sheet J ("Project Quarterly Breakdown") exists in the Workbook, but there is no Sheet K. Furthermore, Sheet J draws its top-line figures from other sheets – it has no facility to enter University numbers independently. This appears to be an error in the Excel worksheet. Please could you advise how we are supposed to enter HEI Labour and Overhead costs?**

Answer: You are correct that this is an error in the Excel workbook. The finance form should not have included any reference to separate sheets for HEIs to capture Labour and Overhead costs. Applicants are advised to disregard the sentence in cell B7 on Tab B referring to HEI costs: 'Higher Educational institutions (HEI), applying as project lead organisation or within a consortium, please use 'Sheet J' & 'Sheet K' to capture Labour and Overhead costs.'

- 38. Within the 'Levelised cost of hydrogen' workbook, there a number of baseline costs from August 2021. Energy costs, as an example, have changed significantly over this period and therefore this will affect the 'impact' figures we supply and how attractive these are. Do you have any plans to update the baseline figures? Are these changes factored into the decision making process?**

Answer: To facilitate a fair comparison between a baseline Levelised Cost of Hydrogen (LCOH) and a potential future LCOH achieved with the proposed innovation, BEIS has provided indicative costs for labour, energy and water. The baseline costs in the workbook include a projection for energy prices in the future, and while we acknowledge that present and future costs may differ from these, they help to provide a level playing field for applicants to compare their technology with the baseline LCOH. Applicants can opt to change the labour, energy and water costs used to calculate the cost of their solution, as long as they can justify the difference.



39. We are experiencing problems reconciling the baseline figures in the workbook and appreciate if we can have clarification. These as follows:

Firstly confirmation of input data:

Based on BEIS data from unlocked cells

3.7 x million MWh generated (assumed per year).

CAPEX 140Million GBP

Fixed Opex 46 million

Biomass cost 180 million GBP

Life 30 years.

- i. **CAPEX should be $140/(3.7 \times 30) = 1.3$ GBP/MWh. (figure from BEIS 38)
Was the factor of 30 year life missed ?
(For info: the Fixed Opex looks correct)**
- ii. **Fuel cost is $180/3.7 = 48.6$ GBP/KWh.
This is correct in the unlocked BEIS cells but on the published presentation sheet is 54 (a difference of 9.1%) why ?**
- iii. **Plant capacity.
BEIS 59MW title
Output 3.7 million MWh / year
How does the output above correlate to 59MW?**

Answer: The baseline values in the Levelised Cost of Hydrogen workbook are provided as a point of comparison to enable applicants to put forward their own projections for how their innovation and project will influence the costs associated with Hydrogen BECCS. BEIS does not require applicants to follow the same methodology that has been used to generate the baseline values in the workbook, for example by reviewing the assumptions and calculations in the report referenced on Tab 5. Instead, please only make comparisons to the values given in the workbook. Applicants are expected to fully justify their own methodology for calculating the values they input into the workbook, including their assumptions. If an applicant's fully-justified methodology results in a comparative increase in costs from the BEIS baseline, for example, applicants should explain why this is the case, in the context of demonstrating the potential for the innovation to reduce costs in the Hydrogen BECCS process chain.

Applicants won't automatically be marked down if their costs come out as higher than the baseline values, as long as the methodology is justified and the written response makes a strong case for the potential of the innovation to result in cost reductions.

40. Are 2-page CVs needed for all participants in the project, or just the lead individual at each organisation?

Answer: Assessment Criterion 5(b) requests applicants to 'Provide brief CVs of key individuals within the project'. This is not limited to the lead individuals at each organisation. It is up to applicants to determine the key individuals involved in the proposed project.



41. BEIS's responses to questions 20 and 21 set out in the Q&A published on 7th February 2022, and the response to question 35 in the November 2021 workshop Q&A published on 12th January 2022 do not align. Which response is an applicant to follow?

Answer: BEIS has reviewed these answers and has not identified any contradictions, since the answers refer to different circumstances and actions. Responses 20 and 21 refer to circumstances where the IP could be **assigned to BEIS** or BEIS could require the applicant to grant a license to third parties. Response 35 refers to **granting a license to BEIS** for non-commercial purposes, which differs from the assignment of IP to BEIS.

42. In respect of the following –

If within five years of its creation applicants have not commercially exploited intellectual property generated from the work (Arising Intellectual Property), then in line with clause 28(5) of the Contract Terms and Conditions, BEIS may request the applicant to assign the Arising Intellectual Property to BEIS.

If the applicant generates IP within 3 months, without commercial exploitation, BEIS could ask for the IP to be assigned to BEIS since the time period is less than 5 years. Does BEIS mean " after 5 years of IP creation " not " if within 5 years of its creation ". Please clarify.

Answer: In the Competition Guidance Notes Section 11.2, and in clauses 28(5) and 28(7) of the Contract Terms and Conditions to which the Competition Guidance Notes refer, BEIS's interpretation of (and therefore the intention of) "**If within five years of its creation** (applicants have not commercially exploited intellectual property generated from the work..)", is "**If once five years have passed since the creation of the Arising Intellectual Property** (applicants have not commercially exploited intellectual property generated from the work..)".

43. Enquiry about the uncapped indemnities within the competition terms and conditions, which are as follows:

Clause 18 (1) provides for an indemnity for breach of contract (18(1)) – The personal injury/death element of this is uncapped;

Clause 18 (5) provides for an uncapped indemnity for infringement of a third party's intellectual property rights;

Clause 30 (9) provides for an uncapped indemnity in respect of any loss or destruction of government property/data; and

Clause 31(16) provides for an uncapped indemnity in respect of data protection laws.

We would be asking that these indemnities also be capped by the limitation clause 18(7) so that there is an overarching liability cap.



Answer: BEIS will not be amending the T&Cs with regard to capping of liability where it is currently uncapped in the T&Cs, as published with the competition guidance.

- 44. Clauses 27(6) and 28(7) [in the Competition Terms and Conditions], refers to BEIS's right to request that the applicant sub-license the intellectual property and that this can also be actioned where "the Contractor has established a monopoly position". Given the company's position in its market as the sole provider of services, could you provide clarification as to what BEIS means by this wording.**

Answer: The use of the term 'monopoly' in these clauses only applies to the position of the Contractor relating to the commercial exploitation of the project's Arising Intellectual Property. It does not apply to other aspects of the Contractor's core business, which may operate as a sole provider of a service or product.

- 45. Notices – (Clause 3) [in the Competition Terms and Conditions]. We do not accept service of notices via fax. Can this section be varied to account for this? Furthermore, all notices need to be copied to the company Secretary and therefore Clause 3 will need to be varied to that effect.**

Answer: BEIS recognises that fax may no longer be appropriate for a number of suppliers, and so all references to facsimile delivery in the Competition Terms and Conditions have been removed.

- 46. Clause 9 [in the Competition Terms and Conditions] – Please note the timescales applicable for a request for information under FOIA/EIR regulations by BEIS. Also, this clause only relates to assistance by Contractor to BEIS in complying with its obligations under FOIA and EIR, but fails to acknowledge that the company is also subject to the provision of EIR. This clause should therefore reflect that both parties are required to comply with the EIRs in particular, and therefore each party may need to cooperate with the other party in this respect during the course of the Agreement.**

Answer: If necessary, BEIS is willing to make the clause mutual so that both parties co-operate. The last paragraph of 9 (3) could be amended to say: '**Both parties** shall provide all necessary assistance as reasonably requested by **either party** to enable it to respond to a Request for Information within the time for compliance set out in section 10 of the FOIA or regulation 5 of the EIR.'

- 47. We are in discussions with a number of highly specialised EPC contractors who specialise in pilot plant design, construction, testing and commissioning and operation. These are different businesses from the mainstream EPC companies who design and build commercial scale process plants. As such their primary business aim is to make a profit from pilot plants. They cannot, therefore, take on pilot plant contracts on a no profit or loss leader basis.**



We are experiencing resistance from the specialist EPC's to the combination of BEIS' Phase 2 financial limitations: (i) no profit; (ii) no additional funding, and (iii) an absolute cash ceiling.

Is there any way some financial flexibility can be built into the Phase 2 arrangements provided that: (i) An absolute cash cap limit to the taxpayer's liability, and (ii) Value For Money for the taxpayer, can be fully demonstrated during the application for Phase 1?

Answer: To ensure SBRI principles and competition rules are adhered to, BEIS is not able to modify the competition T&Cs in line with the above request for any supplier.

General

48. Would you please direct me to the slides presented by BEIS and the outputs of the [Net Zero Innovation Needs for Biohydrogen with Carbon Capture and Storage] workshop, I am unable to locate the link.

Answer: The slides and outputs of the workshop held in July 2021 have been incorporated into the slides presented at the follow-up event in November 2021, and in the Competition Guidance Notes, both of which can be downloaded on the Hydrogen BECCS Innovation Programme competition page:

<https://www.gov.uk/government/publications/hydrogen-beccs-innovation-programme>.

Section 2: Update to the Competition Guidance Notes

Exclusion criterion (g) in Section 4.5 of the Competition Guidance Notes published on 12 January 2022 excluded the following from the scope of this programme: Technologies which generate hydrogen via electrolysis even when electricity has been generated from a biological source.

*This exclusion criterion has since been amended and an updated version of the Competition Guidance Notes (Version 2) has been published on the [competition web page](#) and [Contracts Finder notice](#). Exclusion criterion (g) now reads: Technologies which generate hydrogen from a non-biological feedstock, such as electrolysis using Alkaline, Polymer Electrolyte Membrane (PEM) and Solid Oxide Electrolyser (SOE). Microbial Electrolysis Cells (MEC) and other bio-electrochemical systems are **not** excluded from this competition, providing they meet all other eligibility criteria.*



Section 3: Questions submitted 12-26 January 2022

Category 1 – Feedstock Pre-Processing

1. **With regards to the feedstock to be used, does the composition of the feedstock need to be specified within the application document?**

Answer: Regarding feedstock composition, applicants should provide assurance that their proposed feedstock meets the 25% minimum biogenic content requirement in line with exclusion criterion (d) (See Competition Guidance Notes, Section 4.5). Depending on the innovation, it may also be relevant to outline details of feedstock composition in relation to assessment criterion 2(b): Greenhouse gas emissions and Environmental impact (See Competition Guidance Notes, Section 7.1, and Appendix 4).

2. **Has the feedstock eligibility information been sent out at this time? Could you please provide some information on which waste feedstocks are allowed?**

Answer: Please refer to the Competition Guidance Notes, Section 4.5, and in particular exclusion criterion (d).

3. *We intend to develop an innovative pre-processing technology applied to a particular waste-based feedstock (i.e. having a defined EWC code), which could show a certain variability in composition. The Competition Guidance Notes mention that waste-based feedstock must have above 25% content of biogenic material, on an energy basis. What kind of evidence is required to show the compliance to this energy content criteria? Would a literature review and data analysis of existing published work (such as academic papers, sector studies, governmental reports), showing that the average of the reported biogenic energy content values are above the required criteria, be deemed sufficient?*

Answer: Yes, this would be sufficient as evidence to demonstrate the eligibility of the feedstock in relation to exclusion criterion (d) (See Competition Guidance Notes, Section 4.5).

4. **Can it be clarified if the % biogenic energy content has to be intended as a % of the whole feedstock LHV (lower heating value) or HHV (higher heating value)?**

Answer: As outlined in other Government schemes, e.g., the 2018 Contracts for Difference Fuel Measurement and Sampling Process Guidance, the energy content should be measured on a Gross Calorific Value (GCV), also known as Higher Heating Value (HHV).

5. **Would the adaptation of an existing material processing technology, currently operated commercially in sectors different from gasification, be deemed eligible for applications to Category 1?**

Answer: If it can be demonstrated that the technology being proposed is sufficiently different to the existing technology so as to be deemed innovative, then this could be



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eligible. Please also note eligibility criterion 1 (see Competition Guidance Notes, Section 8), which states that technologies must be at TRL 4 – 6 at the start of the project. Please also note eligibility criterion 7, which states that projects can only be funded where evidence can be provided that innovation would not be taken forwards (or would be taken forwards at a much slower rate) without public sector funding.

- 6. Within this biohydrogen funding round is it possible to include the establishment of trial plots of 2 new perennial non forestry, non-invasive biomass species which are currently not grown in the UK?**

Answer: Growing biomass feedstocks would not be considered within the scope of any of the technology categories in this competition. Please see the Competition Guidance Notes Section 4 for further details of the technologies considered within scope. The scope for Category 1 includes innovative pre-processing technologies which will optimise biomass and waste feedstocks for use in Advanced Gasification Technologies.

- 7. For Category 1, does the scope of the section include the delivery of the feed material to the gasifier or are only pre-processing operations considered within this category?**

Answer: Category 1 will only support pre-processing technologies which optimise biomass and waste feedstocks for use in Advanced Gasification Technologies (see Competition Guidance Notes, Section 4.1). Delivery of the feed to the gasifier would only be considered within scope if it has a direct and material role in optimising the feedstock.

Category 2 – Gasification Components

- 8. Does the syngas treatment system have to be connected to a syngas stream from a gasifier – or can it be any gaseous mixture that resembles syngas from gasification in its chemical composition?**

Answer: BEIS has a preference for syngas treatment to be demonstrated on real syngas generated by a biomass/waste-fed gasifier, so as to ensure solutions developed are fit for purpose. However, if the project can demonstrate that the pseudo-syngas composition is representative of real syngas, and the testing plan provides confidence that the treatment system will be fit for purpose when used with real biomass/waste-derived syngas then such projects will be considered. Particular attention should be given to the contaminants such as tars arising from biomass/waste-fed gasifiers.

Category 3 – Novel Biohydrogen Technologies

- 9. The company I work for has developed a unique, patented plasma process for transforming methane into hydrogen and graphene. We are planning to partner with a commercial AD operator, deploy a mobile reactor system and perform**



pilot studies to assess the commercial feasibility of using our technology to convert biogas/biomethane into hydrogen whilst capturing carbon as high value graphene. Would this approach fit the eligibility criteria for category 3: novel biohydrogen technologies of the competition?

Answer: This technology would be eligible to apply to Category 3 of the competition, providing none of the technology exclusions outlined in Section 4.5 of the Competition Guidance Notes are applicable to the technology. Applicants are also encouraged to review the eligibility criteria outlined in Section 8 of the Competition Guidance Notes.

10. I'm interested in submitting a proposal under the Novel Biohydrogen Technologies category. The technology involves a form of biohydrogen production using a novel gasification technique, so I wanted to check whether this would best fit under category 3 or category 2 please.

Answer: The scope for Category 3 covers the development of novel biohydrogen technologies where the core conversion technology is not gasification. For the purpose of this innovation programme, the term Advanced Gasification Technologies and the use of the term gasification refers to gasification as a thermal conversion technology used to convert biomass or waste feedstocks into a syngas which can be upgraded to produce bioenergy products. Any gasification technology that meets this definition would not be eligible for Category 3. For Category 2 eligibility, please refer to the technology scope as outlined in the Competition Guidance Notes Section 4.2.

11. Technologies which generate hydrogen via electrolysis have been deemed out of scope even when electricity has been generated from a biological source. Are microbial electrolysis cells (MEC), and other bioelectrochemical systems not eligible for funding via this innovation programme?

Answer: Exclusion criterion (g) in Section 4.5 of the Competition Guidance Notes published on 12 January 2022 excluded the following from the scope of this programme: Technologies which generate hydrogen via electrolysis even when electricity has been generated from a biological source. The intention behind exclusion criterion (g) is to exclude projects where the core technology focus is on the development of standalone conventional electrolysis technologies such as Alkaline, Polymer Electrolyte Membrane (PEM) and Solid Oxide Electrolyser (SOE) to generate hydrogen even if bioenergy-derived electricity is used as the source of energy. For this reason, we have decided to clarify exclusion criterion (g) and have updated the Competition Guidance Notes with the following wording: Technologies which generate hydrogen from a non-biological feedstock, such as electrolysis using Alkaline, Polymer Electrolyte Membrane (PEM) and Solid Oxide Electrolyser (SOE). Microbial Electrolysis Cells (MEC) and other bio-electrochemical systems are **not** excluded from this competition, providing they meet all other eligibility criteria.



Eligibility

- 12. Although the project and application would be led by a UK based company, can we include University colleagues from Portugal as part of the team? This is where most of the technology theory originates with the UK side bringing feedstock expertise.**

Answer: Yes, this is permitted as long as the project lead is a UK registered company, academic, research, public, third sector or community organisation. Please also refer to eligibility criterion 6 around the location of activities funded in the competition (See Competition Guidance Notes, Section 8.5 & 8.6).

- 13. Must the Phase 2 pilot demonstration be located within UK, or can it be located within EU?**

Answer: Please refer to eligibility criterion 6 (see Competition Guidance Notes, Section 8.5). This states that Phase 1 and Phase 2 activities must be conducted largely in the UK (and the majority, over 50% of the eligible activity (resources and goods) must be incurred in the UK). Therefore, it is unlikely that a demonstration located outside of the UK would be eligible.

- 14. Can a Public Limited Company (PLC) apply for this competition?**

Answer: Yes.

Application Process

- 15. I note that there are 3 parts to the project - feedstock pre processing, gasification components and novel biohydrogen technologies. We are confident that we have both technology and novel feedstock opportunities that could be scaled up for biohydrogen opportunities in the UK but we struggle with which category we would need to submit an application within. To confirm feedstock suitability would need access to our proposed technology. The technology is both gasification and of a novel technology. If we submit one application to include all 3 aspects then the maximum sum available in phase 1 may be insufficient to complete the stage to the level needed to move on to phase 2. If we submit 3 individual projects then all 3 may not secure funding and one part is very reliant on the others. I would be grateful for your guidance in this matter.**

Answer: Bids to any category must only include work to develop a technology within the scope of that category and each must be a standalone project. We expect applicants to consider the dependencies and risks associated with their project plans, and to offer assurance in their application that if the project is awarded funding, this will represent good value for money for HM Government (please refer to assessment criterion 4 in the Competition Guidance Notes, Section 7.1).



16. Does the Phase 2 pilot demonstration industrial or academic partner have to be identified at the time of the Phase 1 bid?

Answer: Applicants need to identify their key partners for their Phase 1 project in their Phase 1 application. Identification of Phase 2 partners can be a Phase 1 activity.

Technology Readiness Levels

17. Is the development of an innovative TRL 4/6 'component' integrated into a TRL 8/9 'core technology' for the specific purpose of enhancing hydrogen production, and reducing LCOH, within scope for the programme?

Answer: Yes, this would be eligible.

18. What are the 'key' criteria BEIS consider in determining whether the proposed innovation has reached TRL4/6?

Answer: Please refer to the Competition Guidance Notes, Appendix 1 for the definitions BEIS has provided. We expect applicants to assess and justify the TRL of their innovations using these definitions.

Commercial

19. Is matched funding in excess of £5m permitted for Phase 2? If not, why?

Answer: There is no matched funding permitted in either Phase 1 or Phase 2 of the Hydrogen BECCS Innovation Programme. This is because Phase 1 and Phase 2 funding will be awarded using the Small Business Research Initiative (SBRI), which must fund 100% of eligible project costs. The purpose of an SBRI relates to the pre-commercial nature of the procurement, which seeks to support innovation that would not be taken forwards (or would be taken forwards at a much slower rate) without public sector funding.

The key principle of an SBRI is that 100% funding is provided to deliver the scope/requirements of the competition and as such matched funding to deliver this work is not permitted.

20. Do successful applicants assign IP before commercialisation irrespective of if the applicant brings their technology to market within 5 years?

Answer: The Contract Terms and Conditions do not require suppliers to unconditionally "assign" their IP to BEIS. Please see Section 11.2 of the Competition Guidance Notes. Applicants will retain ownership of the intellectual property generated during both phases of the project subject to the Contract Terms and Conditions. Projects receive financial support and retain any intellectual property generated, with certain rights of use retained by BEIS. If within five years of its creation applicants have not commercially exploited intellectual property generated from the work (Arising Intellectual Property), then in line with clause 28(5) of the Contract Terms and Conditions, BEIS **may** request the applicant to assign the



*Arising Intellectual Property to BEIS. In line with clause 28(7), under the same circumstances, or if applicants have established a monopoly position, BEIS **may** require the applicant to license the Arising Intellectual Property to third parties nominated by BEIS.*

- 21. Does the H2 BECCS team recognise that private equity will not invest in the commercialisation of a technology where the IP has been preassigned (ie: rights over the technology has already been allocated to a 3rd party)? Essentially, successful participants are required to pre-assign IP in order to qualify for funding. This is incredibly risky unless BECCS clearly sets out how the participants can recover 100% of their IP to enable private equity to invest.**

Answer: Please see answer to Question 20 above.

General

- 22. Can the chemical outputs of a project funded by the Greenhouse Gas Reduction SBRI be the input of this H2 BECCS SBRI programme?**

Answer: This question refers to projects funded under the Direct Air Capture and other Greenhouse Gas Removal technologies competition which is part of BEIS' Net Zero Innovation Portfolio. Yes they can, provided that there is no sale or purchase of those products or outputs included in either project. Please also note that BEIS will not fund the same piece of work twice, and therefore it will need to be made clear in any bid that the use of outputs from other SBRI programmes does not duplicate work that BEIS has already funded.

- 23. Do the Phase 1 deliverables include: EITHER (i) the complete design 'ready to build' for the Phase 2 pilot demonstration OR (ii) the detailed conceptual design plus performance criteria against which the Phase 2 pilot demonstration design, construction and operation can be tendered?**

Answer: Section 3.1 of the Competition Guidance Notes summarises the deliverables anticipated with further clarifications in Section 5. This includes:

- 5.1 (c) A detailed engineering design for a demonstration project lasting 24 months that could be taken forward between 2023 and 2025 within the funding budget for Phase Two projects

Therefore option (i) the complete design 'ready to build' is most likely to comply with 5.1(c). If this is not feasible within the timescales, applicants should clearly outline the scope of work achievable during Phase 1 (Assessment Criterion 5(a)) and provide assurance that the project expected to be carried out in Phase 2 (Assessment Criterion 1(a)) will still be successful with outstanding design activities. Performance criteria are also applicable, see paragraph 5.1(d) of the Guidance Notes.



24. Within phase 1 can a project just be the theoretical and engineering demonstration of the process or does it require a laboratory scale prototype/demonstrator for proof of concept.

Answer: Applicants should provide assurance that their Phase 1 project will provide sufficient evidence through appropriate means, that the Phase 2 demonstration unit is likely to achieve the objectives of the competition.

The Phase 1 competition excludes innovations outside of Technology Readiness Levels 4-6 (See Competition Guidance Notes Section 4.4, and Appendix 1). This means that a technology needs to have at least completed Laboratory Testing/Validation of Component(s)/Process(es) to be eligible. Evidence provided in Phase 1 could therefore be a theoretical / desk-based demonstration of the process as long as the outputs provide sufficient information to support the Phase 2 activities.

25. Is there any preference for the pilot demonstration to be undertaken by an academic or industrial partner?

Answer: BEIS does not have a preference on this matter.