REA Response:
Hydrogen Production and Industrial Carbon Capture Business Models

The Association for Renewable Energy & Clean Technologies (REA) is pleased to submit this response to the above consultation. The REA represents industry stakeholders from across the whole heat sector and includes dedicated member forums focused on green gas ,hydrogen, biomass heat, biomass power, renewable transport fuels, thermal storage and energy from waste (including advanced conversion technologies). Our members include generators, project developers, heat suppliers, investors, equipment producers and service providers. Members range in size from major multinationals to sole traders. There are over 500 corporate members of the REA, making it the largest renewable energy trade association in the UK.

1. **Do you agree with the proposals relating to the Secretary of State's power to direct a counterparty to offer to contract?**

Yes, we support the proposals relating to the Secretary of State's power to direct a counterparty to offer to contract. We encourage the government to move forward with the implementation of the regulations at the earliest opportunity in order that the proposed measures can provide clarity and transparency in the process of awarding contracts for low carbon hydrogen and carbon capture projects.

The regulations provide for a clear process of direction by the Secretary of State, specifying the terms and conditions of the offer, as well as the timeline for compliance by the counterparty. This will reduce the ambiguity and uncertainty surrounding the contracting process and ensure that the eligible low carbon hydrogen producers and carbon capture entities receive timely support.

Furthermore, we are supportive of the fact that the draft regulations allow for flexibility in cases where support needs to be allocated outside of future competitive allocation processes, such as for major and/or novel one-off projects. This will enable the government to support innovative and strategically important projects that may not fit into the standard allocation process.

2. **Is there any information not listed in Table 1 you think should be published in a contract register?**

The REA agrees with the suggested list.

3. **Is there any information in the contracts you think should not be published?**

We support the disclosure of information related to low-carbon hydrogen production and carbon capture projects in the UK. The industry recognises that transparency is important to building confidence for project developers and the wider public on the administration and costs of the scheme. The proposed approach of publishing each hydrogen production and carbon capture revenue support contract while protecting key confidential information is a reasonable one.

We agree with the definition of confidential information provided by the consultation, which includes information that constitutes a trade secret, would prejudice the commercial interests of

any person, or would constitute a breach of confidence actionable by any person. We also agree with the proposed list of information that should not be treated as confidential, including the strike price, capex payment rate, and reference price.

4. **Do you agree with the proposal for including a requirement in regulations on the counterparty to promptly notify the Secretary of State at the point that it considers that it may become unable to carry out its functions (in addition to the formal 3-months' notice period in the Bill)?**

The REA are not intending to respond to this question.

5. **Do you agree with the proposal that new hydrogen production capacity added to an existing production facility would be eligible for support?**

Yes. We agree with the proposal that new hydrogen production capacity added to an existing production facility should be eligible for support. We recognise it will be important to ensure that the application of this criterion is appropriately defined. In our view, it is reasonable to limit support to new expansions or new capacity added to an existing facility, as this would ensure that the subsidy is directed towards incentivising the development of new low-carbon hydrogen production capacity.

However, there are some important considerations that must be considered when applying this criterion. For instance, it is important not to rule out phased projects where some capital investments are made on long lead-in items in advance of a final investment decision for the project. Such phased projects may involve new capacity additions to existing facilities, but they may not necessarily qualify as "new" if some capital investments have already been made. The definitions should be mindful of this and enable support for such projects.

To address this issue, we support the hierarchy approach where the eligibility under the primary legislation is broad, with eligibility set a little more tightly in the regulations, but with final and minor clarifications provided in the allocation round guidance. This approach has worked well in the power CfD and means that the broad framework remains stable while minor adjustments can easily be made between allocation rounds. It should however be acknowledged that while supportive of this approach, it does raise a level of risk that projects may prove ineligible only at the point that the allocation round rules are set. To avoid projects investing, and getting ready for allocation rounds, only to find themselves ineligible, it is critical that government should make clear, as early as possible, its intentions for the kinds of projects it aims to support in the allocation round and then provide clarity around next steps to any development that may sit outside this eligibility criteria.

6. **Do you agree with the proposals for the type of entities that can be party to a LCHA?**

Yes, this proposal for the type of entities that can be party to a Low Carbon Hydrogen Agreement (LCHA) seems reasonable. By not limiting the business models just to the producer, it allows for a broader range of entities to participate in the LCHA, which could potentially lead to more innovation, competition, and market development. The exclusion of third parties/brokers from being parties to the LCHA also seems appropriate, as their involvement could create additional complexities and potential conflicts of interest. Overall, this proposal appears to be well-considered and aligned with the goal of supporting the development of the low carbon hydrogen sector.

7. Do you agree with the advantages and disadvantages set out under option 1? Are there any other considerations for option 1 that we should take into account?

We agree with the advantages and disadvantages set out under option 1, which suggest setting out eligible feedstocks for low-carbon hydrogen production. We believe a wide range of hydrogen production pathways should be recognised and therefore support an approach to defining eligibility by feedstock, rather than pathways. The pathways itself should be considered immaterial if the produced hydrogen meets the low-carbon standard. We would also note that this could work in conjunction with option 3, where the LCHS takes priority as the defining eligibility criteria.

In addition to the four proposed categories of feedstock (water, biomass, waste, and fossil fuel), other considerations, such as residues and industrial off-gases, should also be taken into account to determine their eligibility for support. Government needs to consider the potential of industrial off-gases to produce hydrogen, as they often come from fossil fuel processing and may require a CCS system to be installed if they produce carbon dioxide. The same applies to residues, and they should be treated under a feedstock-based approach to determine their eligibility for support.

8. If we proceed with option 1, do you agree with the list of proposed feedstocks?

Yes, agree with the proposed list of feedstocks for Option 1, which includes water, biomass, waste, and fossil fuel. We particularly note the reference to industrial off gases as an important source of hydrogen production and their role in supporting decarbonisation in refineries, steel, and petrochemical plants. It is essential to understand that these gases are residues from a process, have no off-site uses, and no material economic value, making them wastes or residues from a sustainability point of view.

To ensure only low-carbon processes are eligible, a complete carbon capture and storage (CCS) system must be installed if a fossil fuel-based feedstock is used to produce hydrogen, and the production process produces carbon dioxide. We also support the intention not to mandate CCS for projects using biomass or waste feedstocks, but also encourage DES NZ to consider the interaction of the Decarbonisation Readiness Requirement Proposals also currently under consultation.

9. Do you agree with the advantages and disadvantages set out under option 2? Are there any other considerations for option 2 that we should take into account?

We believe Option 2 will be overly prescriptive and will limit innovation, given the reasons given in the disadvantages section. It will likely exclude potentially viable pathways for producing low carbon hydrogen and it is unlikely to be possible to be comprehensive enough for available options. While the table could be amended and updated to allow for new pathways, this will introduce a significant time lag between the provision of data and changes to regulations being made, which may hamper investment and progress in the industry.

Furthermore, the complexity of the regulations required to prescribe which pathways are eligible could also be a disadvantage. The amendments required to update them as technologies

emerge and market changes occur may make them more convoluted and difficult to navigate, potentially deterring investors from entering the market.

As a matter of principle, we believe that any process that meets the low carbon hydrogen standard should be included in the regulations. Limiting eligibility based on production pathways risks stifling innovation and progress in the industry.

10. If we proceed with option 2, do you agree with the proposed pathways set out in Table 2?

No. While Option 2 proposes a prescriptive approach for setting out eligible production pathways, we note that table 2 does not appear to cover all possibilities, this includes the variety of processes available to turn 'industrial off gases' into hydrogen.

For example, there are a wide range of conversion technologies available for turning feedstock into gases beyond gasification, this includes pyrolysis and plasma processes which are typically widely defined as Advanced Conversion Technologies. Equally electrolysis processes from energy from waste or biomass power projects are also not covered. Table 2 is not comprehensive enough to be the benchmark for eligibility and is unlikely ever to be able to cover all available options. As such, by its nature, such an approach will likely unnecessarily become a limiting factor and slow innovation.

If taken forward, It will be essential for option 2 to broaden the list of eligible pathways to ensure that all low carbon production methods are covered. This would require more complex regulations, which may need to be updated regularly to capture market changes and technological advancements.

Therefore, while Option 2 provides investors with certainty on the eligibility of specific production pathways, a more comprehensive and flexible approach that includes a broader range of conversion technologies, such as plasma technology and off gas conversion, will be necessary to ensure that low carbon hydrogen production is supported across all sectors.

11. If we proceed with option 1 or option 2, do you agree with the proposal to only mandate installation of CCS for fossil fuel feedstocks?

Mandating CCS for hydrogen production pathways using fossil fuel feedstocks is essential and would ensure that emissions are minimised. We do, however, recognise that while biohydrogen is produced from renewable sources, the process of production may still involve emissions that, as the energy system transitions, will also need to be abated. We are supportive of the fact that these should not require CCS to be installed if they are still meeting the LCHS. We would, however, also encourage DES NZ to consider how requirements in the HPBM aligns with the power sector Decarbonisation Readiness Requirements currently being consulted on

It remains important that there is a clear pathway to achieving the UK's net-zero emissions targets. By eventually ensuring the capture and storing of emissions from all hydrogen production pathways, the country can ensure that it is making progress towards its emissions reduction goals.

12. Do you agree with the advantages and disadvantages set out under option 3? Are there any other considerations for option 3 that we should take into account?

Yes, we agree that regulations should refer to the Low Carbon Hydrogen standard in a broad sense, as it applies at the time of a project being contracted. It is important that allocation

rounds are clear on which version of the standard is being used, and that this should not change between announcing the details of the round and contracts being signed. This is particularly important for avoiding potential negative impacts on specific producers.

Alternatively, changes to a live Low Carbon Hydrogen Standard can have implementation dates built into the guidance, making clear that changes are not retrospective and apply to new projects after X date. This should especially apply where the changes make it harder for hydrogen production to be done. This is common practice with legislative changes, for example see the eligibility amendments made during the lifetime of the Renewable Heat Incentive.

One advantage of referring to the Low Carbon Hydrogen standard is that it would help ensure strong alignment between the regulations and round by round allocation guidance, with the most direct link to the standard. It would also provide clarity and certainty to industry if a fixed version of the standard is referenced, and if a live version is referenced, this would ensure eligibility requirements are always aligned with the latest version of the standard.

13. Which of the proposed options to define eligible low carbon hydrogen production pathways do you prefer: i) Set out eligible feedstocks, ii) Set out eligible production pathways, iii) Refer to a fixed version of the standard or iv) Refer to the live standard

Overall, we support the use of a live LCHS as the key criteria to determining eligibility. If necessary, we believe this could be combined with option 1 where a broad range of eligible feedstocks are set out.

We do not think Option 2 is appropriate as setting out eligible production pathways will restrict innovation.

The key criterion for whether the hydrogen produced is sufficiently low carbon is the Low Carbon Hydrogen Standard (LCHS). Therefore, compliance with the LCHS should be mandatory to access support, whether at the regulation, allocation round, or contract level. If the concept of a standard is no longer needed, it would be an argument to revise the standard, rather than doing away with it altogether.

As stated in our response to question 12, the LCHS will evolve over time. Therefore, the regulations should refer broadly to the LCHS as amended from time to time. Allocation rounds (and contracts) should refer to a specified version of the LCHS, which should be unchanged between the date of confirming allocation round details and the date of entering into the relevant agreements. Alternatively, amendments to the standard should have clear application dates within the guidance itself.

14. Are there any other approaches to define eligible low carbon hydrogen production pathways which would achieve our policy aims whilst also meeting the Bill definition of a "low carbon hydrogen producer"? Hydrogen production and ICC business model revenue support regulations

REA are not intending to answer this question.

15. Do you have any other comments on the proposals for the hydrogen eligibility regulations?

REA are not intending to answer this question

16. Do you agree with the proposal to take a technology neutral approach, and not place restrictions within regulations on the types of technologies that may be used by a carbon capture entity to capture carbon dioxide?

Yes. We strongly agree with the technology neutral approach. Technologies will continue to evolve and, as has already been identified by the 2022 Government Review of Next Generation CCS technologies, different technologies suit different industrial applications. Noting specific technologies in the regulations would restrict innovation and stop the delivery of efficiencies within the sector.

17. Do you agree with the approach to not limit within regulations the class of person that may be eligible for a revenue support contract?

Yes. Given the intention to apply the ICC contract to a wide range of industrial sectors, it is likely it will need to be applied to a variety of corporate arrangements. This includes energy from waste sites, which as part of local authority waste management infrastructure, often have differing ownership models and corporate structures. As such, we are supportive of not limiting the class of person that may be eligible for a revenue support contract.

We, however, recognise that it is likely suitable that those receiving support should be UK based projects and be part of a UK Limited company, given the use of taxpayer's money. This would be consistent with the approach taken in other policies and would help support wider stakeholder and public transparency and confidence in the policy.

18. We have proposed to exclude from eligibility entities that capture carbon dioxide which have been produced from a power generation facility that is solely connected to the transmission or distribution network (exempting CHP and EfW facilities). Do you agree with this proposed approach?

Yes. We recognise the need to focus the ICC Contract on industrial processes and that other greenhouse gas removal contracts, such as the Power BECCS, DPA and GGR business model are meant to be available to support CCS projects connected to the transmission and distribution network. We are also supportive of, and see as essential, the intention to still ensure that CHP plants and EfW Plants should still be eligible regardless of if they are connected solely to the electricity transmission or distribution network.

We note that the inclusion of energy from waste sites should also include biomass power sites utilising waste wood feedstocks, recognising that this itself is an industrial waste management process and should also be eligible for the ICC. Waste wood arises from the construction sector or civic amenity waste sites providing a valuable waste processing service along with power generation. Use of waste wood capacity sees three million tonnes of waste wood diverted from landfill annually. We believe that the proposed definitions will allow for such sites to be included and this should be clearly reflected in any relevant guidance.

Finally, we note the intention to change to the definition around "accredited CHP station" and suggest that DES NZ should still ensure that supported CHP sites are CHP Quality Assurance (CHP QA) compliant in order to receive support.

19. In drafting the regulations, we propose to define a generating station, a combined heat and power generating station and an energy from waste with CHP station, based upon similar definitions laid out in the Contracts for Difference regulations. Do you have any comments on this approach?

Overall, we are supportive of utilising the CfD definitions, creating consistency between schemes.

However, raise the following points in the drafting:

- We believe the current definition does allow for sites using waste wood to also be covered by the ICC contract. This is to be supported and should be reflected in relevant guidance.
- We question why DES NZ wishes to remove the phrase "accredited CHP station" - we suggest that supported CHP sites should continue to be CHP Quality Assurance (CHP QA) compliant.

20. Do you agree with the approach to exclude from eligibility a carbon capture entity which is, without already being party to a revenue support contract, capturing carbon dioxide with a view to its permanent geological storage through an existing or operational CCUS plant?

Yes. We agree that support should be targeted at new carbon capture and storage activities. We are also supportive of the intention to keep eligible existing CCU sites who may want to access support to be able to connect to the T&S network. This recognises the transitional steps that some sites will need to go through, to get to a point of delivering permanent storage of carbon.

21. Do you have any other comments on the proposals for the industrial carbon capture eligibility regulations?

It is important that allocation round processes do not introduce unnecessary additional eligibility criteria beyond those already set out in the design of the ICC contract. Confidence has already been damaged by the introduction of 100 MW thresholds in the allocation criteria for Power BECCS contracts within the last cluster sequencing allocation process. This immediately excluded a number of smaller projects that had been gearing up to apply for support and have been left with no clarity on their route to market. Similar restrictions should be avoided with the ICC allocation process, with it being clear to industry what is to be eligible.

We would also reiterate the need for these legislative regulatory processes to be completed as quickly as possible and for ICC contracts to be advanced so that final finance decisions can be made and the UK can quickly start to deploy Industrial carbon capture projects.

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