REA response to DESNZ Call for evidence on the future policy framework for allocation of the LCHA.

The Association for Renewable Energy & Clean Technologies (REA) is pleased to submit this response. The REA represents industry stakeholders from across the 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.

We have engaged with the energy department on a wide range of hydrogen policy. This includes:

- Feedback on the Low Carbon Hydrogen Standard version 3
- Development of a hydrogen certification scheme
- Low Carbon Hydrogen Agreements and the policy decisions behind them
- Forthcoming decision on blending into the gas grid

A number of our members are particularly interested in production pathways other than electrolysis or methane reformation and we have engaged in detail on these 'alternative' pathways.

We look forward to continuing to engage with the department on these and related policies.

Although not within scope of this call for evidence, we would like to highlight that the political uncertainty around funding for hydrogen support is a serious concern for our members. We appreciate there were concerns around the previously proposed levy, leading to this not being included within the current Energy Bill, but there are still no decisions on alternative long term funding arrangements.

It is essential that this uncertainty is resolved as soon as possible to avoid having a chilling effect on plans to develop hydrogen projects in the UK.

Chapter 2- Transitioning to price-based competitive allocation.

Overarching:

1. What should be the strategic objectives of future hydrogen allocation rounds beyond HAR2? Do you agree with the descriptions of the primary objectives and broader outcomes as set out in Chapter 2?

The REA supports the principle of the primary objectives and agree that objectives are required to ensure allocation rounds are well thought out decisions and future projects are driven by economic efficiencies. However, there are concerns that one objective could be counterproductive to the other.

The REA acknowledges that cost reductions must be sought, where possible, to provide value for money and therefore could be considered the right direction of travel. However, there are significant concerns about this being required so early in the process. The system should be allowed to become a more liquid market before making changes that could alter the confidence and investment potential. At this stage there is a need to allow the market to develop significantly to create not only sufficient supply but to also ensure there is enough demand. Only when the right conditions are in place and allowed to stabilise can the consideration be made to introduce cost savings through competitive allocation.

Additionally, the other primary objective, deployment at scale, is focussed on scaling up specific projects (larger individual projects) rather than providing a scaleup on the number of projects. We agree this would help achieve the 10GW target of low carbon hydrogen by 2030 target but may not be possible to get a quick and guaranteed roll out. And this is where the broader outcomes of harnessing the electricity system, economic benefits; supply chain development and security of supply of hydrogen help to provide additional space for the whole system to grow more naturally.

It may be better to have a more strategic objective, ensuring the system of hydrogen production can be effectively produced, maintained, and delivered to end users as effectively as possible before trying to focus on larger scale projects and costs efficiencies. The awards for projects in the HAR1 round have yet to be finalised so deployment has not yet started, and this process would act as a good baseline to help understand where cost savings can be made as well as aid market confidence.

2. To what extent, and how, should a hydrogen allocation mechanism be designed to support the primary objectives and broader outcomes as set out in Chapter 2?

Although there is support for the primary objectives and boarder outcomes, applying a hydrogen allocation mechanism to meet these objectives, such as weighting decisions on meeting the objectives would be limiting at this early stage. It is likely to significantly curb investment and particularly the innovation of other non-CCUS enabled technologies and alternative hydrogen pathways. The electrolysers are further along with their development, and this is in part due to prioritising the allocation for these technologies within the HAR1 and HAR2 allocation rounds.

The focus on the objectives/outcomes and priorities will change with time as the hydrogen production industry develops. For example, at this stage, deployment at scale will not happen until projects have been commissioned and production delivered. This will need, as well as encourage the economic and supply chain development. In turn harnessing the electricity system, especially with encouraging other uses for hydrogen such as H2 to power grid balancing, will help provide security in the supply of hydrogen. All these priorities should naturally lead to costs efficiencies, but this is likely to take some time.

3. How would introducing a price-based competition in 2025 for electrolytic projects, and potentially other non-CCUS low carbon hydrogen projects, impact projects investment decisions?

It is agreed that price based competitive allocation has worked well in the role out of renewable energy market, particularly offshore wind, however this was introduced following a period of successful delivery where significant economic benefits and supply chain development had already been allowed to materialise. The market was allowed time to settle in before introducing a price mechanism for competition to drive costs savings. The transportation network for electricity in these circumstances was mostly in place and unlike hydrogen a unit price better known.

The concern is that a focus on monetary costs will limit the ability to engage new technologies and an alternative may be to assess on social value and carbon emissions balanced with a reduction in the cost criteria. Introducing these cost saving measures prematurely could drive away innovation from alternative hydrogen production sources which could be vital in ensuring a balanced network whilst also providing net zero opportunities. Investment in these projects might be deterred without the initial financial safety net of a less competitive subsidy system. This is especially the case when initial allocation rounds have been restricted to electrolytic production projects, outside of the clusters.

It is important to note that ramping up of future scheme and policy support is important to avoid loss of momentum. Delays in process causing uncertainly also don't help. The competition from other ambitious funding approaches such as the US's Inflation Reduction Act has the potential to capture the investment pot but also the overarching economic benefits.

Harnessing electricity system benefits:

4. Under what arrangements will electrolytic projects purchase electricity? How would introducing a price-based competition in 2025 impact this, and are these arrangements likely to change over time?

Electricity markets are highly volatile. Electric levy is extremely volatile at present leading to the Climate Change Committee indicating the picture is **not good**. REMA could have profound impacts on how the electricity market changes in the future. A cost competitive market would be the same as if setting a strike price so the approach would not therefore be very different. There are notable benefits in providing a system for allocation that is quicker and arguably the auction price process, as proposed by government, may be quicker.

There are so few developments and decisions on infrastructure, so introducing this in 2025 would definitely be too early. It isn't just the production of hydrogen as there is a need to offload and create a functioning marker for the end use and off-taker. Availability of CCUS networks is also a factor in this decision. In addition, how this will be funded is still uncertain with the hydrogen levy now removed from the Energy Bill. There is of course a need to drive up the overall production to meet targets, but we are still very much within the innovation phase, so this feels premature.

As already mentioned in the response to question 3. competitive price mechanism has worked well within the electricity market, but this was stabilised for 20 years or so before moving to more competitive pricing. And this was with a pre-existing infrastructure not creating constraints to off-takers.

5. Which current and future electricity markets do electrolytic projects seek to participate in? How could changes to electricity markets or signals impact this?

There is significant value in hydrogen production being used to alleviate network constraints and avoiding curtailment in the renewable energy markets as this would help to ramp up production whilst also decarbonising the energy system, vital to achieve overall net zero targets. However, while the power sector is itself ramping up to 2030 targets, this will restrict the access to energy and potentially limit production. This may require flexibility in the system to avoid investment constraints.

Future electricity markets are likely to depend on location and access to the grid connections and an `additionality` criteria may be less restrictive in the future, especially with decisions being made on hydrogen blending. As the costs savings in the renewable energy production increase with 2030 targets and beyond, there will be more access to additional energy sources to drive down input costs and prevent a conflict for renewable sources being used for hydrogen production away from direct electricity users. This was an argument used against the introduction of the hydrogen levy.

6. How could electrolytic projects look to configure themselves and operate to deliver 'harnessing electricity system benefits' as set out in Chapter 2? Do you think these configurations/operating models could be feasible and commercially viable, and if not, why?

As mentioned in Question 5 there can be significant benefits to configuring electrolytic operations to provide grid balancing and avoid curtailment. However, the concern would be if electrolytic projects are restricted only to excess power that the ability to maintain a high enough production would be limited and diminish investment potential. There would need to be incentives to balance any restrictions.

Obviously, the amount of accessible power would be best in certain Zones as depicted in Figure 1, so locational benefits will be strongest where projects are set in zones A-C. However, projects for some grid networks can link projects directly to high energy industrial systems such as the South Wales industrial cluster which I currently in a zone F. The locational benefits should also be from the point of offtakers and need rather than access to renewable power sources and efforts to tie in the construction of power sources to service them. Although there is merit to setting locational configurations, there is also the possibility that restrictions will limit projects such as with additionality.

7. Do you have evidence on potential demand for low carbon hydrogen production in locations in the UK that are optimal from an electricity system benefits perspective? Please refer to the map in Chapter 2 ('Figure 1'). Economic benefits and supply chain development:

REA have no evidence on this specific question.

8. How would introducing a price-based competition in 2025 for electrolytic projects, and potentially other non-CCUS low carbon hydrogen projects, impact economic benefits and supply chain development?

It is encouraging that the government particularly recognizes missed opportunities from offshore wind, and therefore has stated a need to ensure the constraints that a supply chain can have on the ability to roll out the low carbon hydrogen economy are addressed. Green skills, through renewable energy and clean technology growth, have been documented through work the REA have completed with Innovas and reported in our annual report, more recently the Review 22. This document sets out the deployment and skills growth expected as the sector expands (a copy can be made available upon request) and also to highlight the economic benefits through market value increases.

It is also important to look across the wider supply chain and beyond the immediate projects and technology providers. It is already recognised that there are constraints in planning with delays in decisions and with the EA permit application, particularly recognised to be a resources issue.

However, there are also notable concerns about civil engineering constraints for large scale project developments due to commitments already felt in this sector with large ongoing projects such as HS2. This, compounded by the lengthy HAR1 process, will mean a bottleneck of project development, even for those that have the required decisions. This may also be in specialist project management and legal expertise as the pool is currently small.

For the reasons provided above, the cost of implementing a hydrogen project could be increase, exacerbated by delays and no costs benefits could therefore be expected until the natural pool of experts through deployment materialises. Imposing a cost benefit mechanism could therefore inhibit growth rather than support it.

9. How should economic benefits and supply chain development be measured and how could this be incorporated into price-based competitive allocation?

The economic benefits and supply chain development could be measured through analysis of the associated companies and operational workforce needed through the life of a project and could be completed as part of a HAR project feedback requirement. This could also be completed through the application process, as there would have been investment for even unsuccessful projects but would also provide an understanding of the investment made for the application process. This could be tracked through other organisations best placed to measure data such as the ONS. Supply chain development may be captured as volume of hydrogen generated to off take.

Technically this could be used to capture data to support temporarily maintaining subsidies as the economic benefits to the UK economy should be better understood. There would also be the capture of business rates and taxes that would be a useful for this process as a balance of overall benefit. It would also provide an understanding of where the skill set and expertise is coming from outside the UK.

The difficulty of trying to capture the benefits into a cost based competitive allocation is that without good baseline data, which would come from a fully functioning system, you would only be trying to capture the benefits without acknowledging the losses. This would only be achieved by providing some initial estimates of expected value.

10. How would introducing price-based competition affect developers' decisions on where and how to invest in supply chains? Security of supply of hydrogen:

Developers' decisions are certain to be dependent on the location for production and off take opportunities, so are likely to vary. Projects for some grid networks can link projects directly to high energy industrial systems such as the South Wales steel and related industries, once developed, with network providers setting time-based targets for providing hydrogen. Where there is a dedicated network planned, this will provide the opportunity for industries to become hydrogen ready and for the hydrogen providers to develop and commission. Where this is not available and outside of clusters projects, investment will be dependent on decision on blending in the gas grid.

11. In a price-based competition, how could pots be designed to best support the 'security of supply of hydrogen'?

Power CfD has been very good to show how this can work, however this has worked best where technologies are similar and for those technologies that the government has wanted to prioritise. This can definitely help drive down costs.

Separating advanced conversion technologies pots from an electrolytic pot will be needed to drive innovation. So, the provision of pots within the system is good in principle. This should be with a spread by location, or technologies and a decision move to the competitive technologies at a later date.

Advanced conversion technologies will help to push net zero so another income stream from carbon savings/ GHG emissions based would allow for more competitive pricing, but this would need to be assured ahead of the auction process to allow for the flexibility.

Chapter 3- Transitioning to price-based competitive allocation.

12. What market conditions need to be in place for introducing price-based competitive allocation? Do you think these market conditions will be in place by 2025?

The principle, as set out in the Government's BESS, to move to price based competitive allocation by 2025 as soon as legislation and market conditions allow is well considered. As with the responses to the consultation on the business model for low carbon Hydrogen, we broadly support the transition to a more competitive based allocation process, but the need to wait to a mature hydrogen market remains. The caveat of needing sufficient projects and pipelines in place is still relevant so these conditions should remain a reason to decide when to transition and given that HAR 1 projects will only be allocated later this year that only leaves 2 years to start construction, commission and deliver on those projects. As HAR2 will open for applicants in Q4 2023 with a similar timescale on allocation decisions, maybe the market constraints should be to specify the definition of` in place` as `in operation`.

13. When considering market conditions and the primary objectives/broader outcomes as set out in Chapter 2, what would be the impacts and likely outcomes of introducing a price-based competition in 2025?

When considering market conditions along with objectives/outcomes, operationally hydrogen production would be in its infancy by 2025. It will be difficult to have confirmed any major supply chain development by this time and unless the projects have already been agreed where there will be a benefit to harnessing the electrical systems a defined in the document, this won't likely have been implemented. There might be small clusters or linked producers and off-takers for specific projects but it's unlikely to have pushed the system to have accelerated outside of these schemes such as with the expected private investment routes, especially not enough to have bult enough stability in the system by 2025.

The drive and interest from industry in Hydrogen is not in question but at present the hydrogen levy has been abandoned with no alternative in place, no decision on hydrogen blending which will drive uncertainly and caution in the market. It would be more realistic to consider a review of the introduction in 2025 rather than to set this as a date to implement and allow the whole system to be harmonised before reviewing.

14. If market conditions are not in place by 2025 for price-based competitive allocation, how should further allocation rounds beyond HAR2 be designed? Please use evidence to support your answers.

The allocation of projects to fulfil the objective of harnessing the power electricity system to avoid curtailment, flexibility and remove constraints may be useful to include in further rounds, along with the alternative hydrogen technologies such as advanced conversion technologies to ensure a robust and diverse hydrogen market. Only once these are in place, within a similar structured system, could there be considered enough balance to assess the hydrogen market as a whole and determine how a future price based competitive market can work.

It may be better to consider more rounds of allocation beyond HAR2 but with the process speeded up to allow for quicker delivery of projects. This would keep the interest in developers and investments but also encourage the whole system delivery of demand from offtakers, skills network and infrastructure to keep up with momentum.

Chapter 4- Non-price factors and further design considerations for price-based competitive allocation.

15. Do you have views on how the design considerations as set out in Chapter 4 should evolve beyond HAR2? Are there any missing?

Non- price factors add an extra layer of complexity to the system, one which already has the electricity reform system underway and can therefore create many more issues than it aims to relieve. Non -price factors are a way of trying to deal with issues resulting from a competitive price-based allocation. Given the message has been made within this response that there should be caution in bringing in a price based competitive allocation too early, this will be equally the same message for non-price factors and further design considerations. There is merit in introducing them where the market has settled and become established. We provided detailed comments to the recent call for evidence on possible inclusion of non-price factors in the power CfD and many of those considerations would also be relevant if introduced for hydrogen.

16. In a price-based competition, how would you design and value non-price factors to support any of the above objectives and broader outcomes as set out in Chapter 2, noting the above non-price factor design principles in Chapter 4?

At this stage, there is concern that in trying to suggest possible designs, that this will change as the market develops and by the time this could be introduced. Therefore, the response will need to be that this is premature and at present the suggestion of non-price factors may drive only allocation of projects from specific areas at the detriment of others. Maturity of the system will allow a stronger understanding of how these can be best introduced.

17. Are there other more appropriate approaches for supporting these objectives and broader outcomes than through implementing non-price factors?

We refer to the response for Question 15.

18. From the mid-20s, what types of companies do electrolytic projects, and potentially other non-CCUS projects, expect to have as potential end users? Do you expect them to be geographically fixed, or flexible?

This may be dependent on what projects have been allocated in HAR1 and HAR2. In order to boost the market, there will need to be as many options and end users as possible, where this can still be considered as the `right technology solution for the right place` but also where there is a need for a transitioning period. Until there is a pipeline network there will be reliance in storage systems and transport.

19. For selecting an allocation body to administer price-based competitive allocation, do you agree that these are the right factors to be included in the Secretary of State's decision?

Currently the LCCC is a private company where the government is the shareholder. It runs other CfD systems so would be familiar with the process and mechanism. So, there would be value in keeping the similar process when a price/based competitive allocation is in place. However, it's not believed the LCCC will also run the auction process.

20. If a price competitive process adopted the concept of 'Delivery Years', similar to the CfD regime, how should we approach designing Delivery Years for non-CCUS low carbon hydrogen projects? Please set out, with evidence, if certain types of projects might require longer lead-in times?

The premise of the delivery years matches the concept set in the Power CfD. This approach can be particularly good for technologies that will take longer, to ensure they aren't ruled out on eligibility criteria. Furthermore, the concept can help projects to set delivery timelines that are realistic. (*Check HAR1 feedback consultation response*).

The commissioning date definition includes a testing requirement for proving commercial operation, as opposed to performance testing to a significantly high % for a period time which will be problematic for projects. So, there is support for delivery years as it works successfully in other systems, but performance testing criteria will put unnecessary pressure on projects. We have raised concerns that the provisions built into the current round of Low Carbon Hydrogen Agreements may be too onerous in the s respect, and also involve unnecessary bureaucracy in terms of advance notification of testing dates. Government will need to review and seek stakeholder input on these provisions, which will only really be available once multiple projects have been through the process of trying to meet them.

21. For HAR1, there was a minimum size eligibility threshold for projects of 5MW. Do you think this threshold should increase for allocation rounds launching from the mid-20s, and if so, to what value? Should the same threshold apply to all non-CCUS enabled production technologies? Please use evidence to support your answers.

As mentioned in the response to question 1, the objective `deployment at scale` is focussed on scaling up specific projects (larger individual projects) rather than providing a scaleup on the number of projects. We agree this would help achieve the 10GW target of low carbon hydrogen by 2030 target but may not be possible to get a quick and guaranteed roll out. The hydrogen market may need time for the whole system to grow more naturally. As has been the case in other industries, bigger is not always better and although there may be a benefit to providing support to fewer projects in order to achieve the target, the scale up doesn't necessarily mean a proportionate increase in hydrogen production. Also, downtime can be far more costly and detrimental to off take demand, rather than the impact from several smaller sized projects. This is the case for options such as hydrogen to power and curtailment avoidance as often the size of electrolysers needs to be small scale to be appropriate and successful.

In contrary to the suggestion that the threshold should increase, we believe that the 5MW is not in itself a good limit and for some industries, especially those with alternative hydrogen pathways technologies, this is already set too high so would need to reduce rather than increase. In the economies of scale, smaller projects should be allowed, as they can be more optimally sized for the feedstock or off takers and assessed on social value and carbon emissions balanced.