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**Response to: Low Carbon Hydrogen Business Model: consultation on a business model for low carbon hydrogen**

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Uniper is an international energy company with around 12,000 employees in more than 40 countries. The company plans to make its power generation CO<sub>2</sub>-neutral in Europe by 2035. With about 35 GW of installed generation capacity, Uniper is among the largest global power generators. Its main activities include power generation in Europe and Russia as well as global energy trading, including a diversified gas portfolio that makes Uniper one of Europe's leading gas companies. In 2020, Uniper had a gas turnover of more than 220 billion cubic metres. Uniper is also a reliable partner for municipalities, public utilities, and industrial companies for developing and implementing innovative, CO<sub>2</sub>-reducing solutions on their way to decarbonizing their activities. As a pioneer in the field of hydrogen, Uniper has set itself the target of operating worldwide along the entire value chain in the future and implementing projects that will make hydrogen the mainstay of the future energy supply.

The company is headquartered in Düsseldorf and currently the third-largest listed German utility. Together with its main shareholder, Fortum, Uniper is also the third-largest producer of CO<sub>2</sub>-free energy in Europe.

In the UK, Uniper operates a flexible generation portfolio of seven power stations capable of powering around six million homes, and a fast-cycle gas storage facility.

**Consultation Response**

We have set out below our answers to the questions in the consultation. Our views in summary:

- Given the differences in the cost structure and potential scale of different types of hydrogen production, it is important that the support provided is in ringfenced pots to ensure that a range of both blue and green hydrogen production is brought to market.
- We agree that the initial bilateral contract negotiations for blue hydrogen producers be via the CCUS Cluster Sequencing process. Government must also make provision for further negotiation with additional projects after that process to support market growth.



- As we move toward a robust and liquid hydrogen market, we will need a standard in the UK that facilitates international trading. The UK hydrogen standard should be designed with international compatibility in mind.

#### **Consultation questions:**

#### **1. Do you agree with our overall approach to introduce a contractual, producer-focused business model covering the proposed scope?**

We agree with the overall approach for a contractual and producer-focused business model. Given the differences in the cost structure and potential scale of different types of hydrogen production, the support provided should be in ringfenced pots to ensure that a range of both blue and green hydrogen production can be supported.

We agree that all hydrogen should meet the UK hydrogen standard in order to qualify for support. It will, therefore, be critical to ensure that the standard is set at a level that does not preclude technologies that can be compatible with net zero by 2050. There should be an incentive via market signals for producers to exceed the standard. We therefore recommend that the government considers Guarantees of Origin, or similar, to allow producers to differentiate their output, and an element of gainshare for achieved sales price above the strike price, where customers are willing to pay a premium for the lowest carbon hydrogen.

As we move toward a robust and liquid hydrogen market, we will need a standard in the UK that facilitates international trading. The UK hydrogen standard should be designed with international compatibility in mind.

#### **2. Do you agree with our approach to the business model design?**

Yes.

#### **3. Do you agree with our minded to position for a variable premium for price support? Please provide arguments to support your view.**

We agree with the minded to position, and in particular for there to be a reference price to provide a price floor. This provides an incentive for producers to seek at least the reference price for their hydrogen and thus, to some extent, establish its value.

#### **4. Do you agree with our minded to position for setting the reference price? Please provide arguments to support your view.**

In principal we agree with using the natural gas price as the counterfactual. It should however, be kept under review as policy develops, for example by reducing or removing allocation of free UK emission allowances to heavy industry. Whilst the natural gas price is the best reference price floor to ensure fuel switching in heavy industries in the short term, in the longer term the relevant carbon price will also need to be incorporated.

We support the move to a market benchmark price once one has been established, but have concerns about how and when this might be achieved. In order to establish a market benchmark price, the CfD will have to make some provision for gainshare above the strike price. If producers can share some element of revenue generated above the strike price, there is an incentive to produce for any elements of the market that are willing to pay a premium (e.g. for lower carbon or higher purity hydrogen), revealing market value over time.



**5. Does our minded to position create any other specific risks, incentives or disincentives which we have not already stated above? If so, what are they and how could the related risks be addressed – either within the model or outside of the model?**

We would have concerns about significant changes in the reference price floor if it reduces the margin from the strike price. Further, gas prices can be volatile, which needs to be taken into account in the design of the CfD.

**6. What do you think is the most appropriate option (or options) for indexation of the strike price? Please explain your rationale.**

This is a very complex issue and we agree the need for further consideration. The cost structure is very different for green and blue hydrogen, as are the energy input costs. Gas and electricity markets are highly competitive and there is not one single natural gas price (e.g. spot and forward prices). Indexation should therefore be based on benchmark prices.

We would support different indexation for green and blue hydrogen, with green hydrogen indexation being against the benchmark electricity price, and blue hydrogen indexation being against the benchmark natural gas price. However non-energy input cost changes that are outside the control of producers also need to be taken into account. These might include, for example, labour costs or CCUS transport and storage costs – the latter of which will not be finalised when the strike price is agreed. Indexation on the basis of energy prices may not be adequate to protect against such cost risks, so it will be necessary for the strike price to be able to be varied outside of indexation. For example, CCUS transport and storage costs should be treated the way that is proposed in the Dispatchable Power Agreement and be fully recoverable within the CfD.

**7. What are your views on whether price support for low carbon hydrogen should be constrained for applications using hydrogen as a feedstock to mitigate potential risks of market distortions? Please explain your rationale, including any suggestions both within and outside the business model to mitigate these risks.**

No, it should not be constrained. Low carbon hydrogen producers should be incentivised to sell into existing high value markets to help prevent the benchmark market price for low carbon hydrogen becoming the natural gas price by default. A well designed gainshare mechanism would incentivise producers to supply elements of the market that are willing to pay a premium (e.g. for lower carbon or higher purity hydrogen), revealing market value overtime.

**8. Do you agree with our overall minded to position on price support? Please provide arguments to support your view.**

We are broadly comfortable with the direction of travel set out in this consultation but agree that more work is needed on indexation. Government needs to give more thought to designing a mechanism that will incentivise the market to reveal the market value of hydrogen, as well as to growing demand.

We would welcome further details of how the price support would work, with worked examples where possible, including:

- What units will be used. In the discussion of the sliding scale compensation mechanism, £/MWh is suggested but £/kg may be more appropriate. If £/MWh is used the calculation needs to be specified for example whether the hydrogen energy volume is to be calculated on a Net Calorific or Gross Calorific Value basis. £/therm might be appropriate where the hydrogen is only used for combustion;
- Whether the CO<sub>2</sub> T&S fee will be fully covered in the strike price consistent with the proposed treatment in the CCUS DPA; and
- Who is responsible for any residual carbon price.

**9. Do you agree with our minded to position of sliding scale for volume support? Please explain your rationale.**

As a concept, we agree the sliding scale compensation mechanism is the best of the options considered. The support is biased towards ensuring that a project can obtain financial close, and adjusts as producers become more successful in supplying greater volumes. However, a sliding scale mechanism should only be employed where producers cannot sell their hydrogen at or above the natural gas price; blending into the gas grid would be a better option, and government should conclude its consideration of this as soon as possible.

There are a number of areas on how the proposed sliding scale mechanism would interact with the business model that need clarification. It would be useful to see a worked example and confirmation of:

- The £ / MWh unitary rebate for initial volumes;
- What % of full output is required for the initial support to kick in;
- The slope of the sliding scale;
- The final £ / MWh unitary rebate that would apply; and
- Up to what cumulative % of full output is covered by this mechanism.

**10. Do hydrogen plants need any further volume support in addition to the sliding scale? Please explain your response, including what kind of additional volume support and under what circumstances it would be needed.**

No.

**11. Do you consider our preferred options on price and volume support outlined in sections 4 and 5 can work across different production technologies and operating patterns? If not, what difference in payment mechanisms might be required between different technologies and how should any downsides associated with that be managed?**

We would need to see more detail to be able to make an assessment.

**12. Do you agree with our proposal not to introduce a separate revenue support scheme for projects of a smaller scale? Please give arguments to support your response**

We agree with the proposal not to introduce a separate revenue support scheme for projects of a smaller scale that are eligible for other support schemes. However, there



should be separate, ringfenced funding for green and blue hydrogen, to ensure that both types of production are supported.

**13. What do you think is an appropriate length of contract? Please explain your rationale.**

The longer the contract offered the lower a strike price a producer can offer government, as longer contracts reduce risk and enable capex recovery to be spread over a longer term.

**14. Should the length of contract vary for different technologies? Please explain your rationale**

For the first of a kind projects that this business model will support, there will be limited visibility of the future market and incomplete understanding of the risks and rewards of operating in it. Government support should therefore reflect asset lifetimes, which are likely to be around 20 years for green hydrogen production, and longer for blue hydrogen production. This will support investor confidence, and reduce the risk of stranded assets.

As the market matures and once we move into competitive allocation, shorter contracts will be more appropriate. A 15 year contract for blue hydrogen production is appropriate to the scale of investment required. Shorter contract terms could be more appropriate for green hydrogen – a ten year contract would align with replacement of electrolyser stacks.

**15. What are your views on the most appropriate option for scaling up volumes?**

It is essential to make provision for scaling up volumes in the early days of the hydrogen market. Of the options considered in the consultation, we prefer the accordion approach. Pre-agreed flexibility will allow producers to contract for a little more than they had originally planned for, without opening the government up to the risk of supporting unconstrained unplanned volumes. Once the additional flexibility permitted by the accordion approach has been reached, producers should have to rebid for additional volumes through a competitive tender process.

**16. Do you agree with our minded to allocation of the risks presented? Please explain your arguments, including if any other key risks have not been identified and how they should be allocated.**

We largely agree with the risk allocation proposals put forward.

However, in the event that the producer is unable to produce hydrogen that meets the low carbon hydrogen standard due to CCS T&S failure, the risk should sit with the T&S operator and be managed through the CCUS T&S Business Model and contracts.

**17. Do you agree with our approach to seek to accommodate different sources of support? Please explain your arguments, including any views on the risk of perverse outcomes linked to revenue stacking and how they might be mitigated.**

Revenue stacking allows hydrogen producers to hedge their risks and sell to more than one sector. However, it's not clear how market distortions due to inadvertent cross subsidy could be avoided. Effective metering and monitoring would be a minimum



requirement to help to reduce such impacts, ensuring that agreed volumes are sold to agreed markets.

As far as possible market distortions should be avoided, therefore double subsidies should not be accommodated. Government should focus on ensuring the CfD is adequate to bring forward a robust and competitive hydrogen market, servicing all demand sectors.

**18. What are your views on the most appropriate allocation mechanism for the hydrogen business model contract, both in the near term (for projects outside the CCUS cluster sequencing process) and the longer term (for all technologies/projects)?**

We support the proposal for bilateral negotiation in the short term, moving to competitive auction in the medium term. We agree that the initial bilateral contract negotiations for blue hydrogen producers be via the CCUS Cluster Sequencing process. Government must also make provision for further negotiation with additional projects after that process to support market growth.

**19. What are your views on the possible approaches to funding the proposed hydrogen business model?**

Levies on energy bills have been effective in providing revenue for decarbonisation policy, but this approach would increase consumer gas bills. Funding from general taxation should also be considered as a more progressive approach. The approach needs to be enduring, sustainable and therefore politically acceptable.

**20. Do you agree with our proposal to allow projects to factor in small-scale hydrogen distribution and storage costs as part of projects' overall costs of production when bidding for business model support? Please explain your arguments, including any considerations relating to avoiding market distortions and facilitating future expansion of the hydrogen economy.**

We agree with this proposal only in the case where the distribution and storage costs are a minority proportion of the overall costs to be supported by the CfD. The business model is intended to bring forward hydrogen production projects, not to be a route to support distribution and storage itself.

**21. Do you consider that bespoke funding model(s) might be needed to enable investments in larger-scale, shared hydrogen networks and storage? If so, which model(s) might be best suited to bring forward projects? Evidence provided under this question will be used to inform our forthcoming reviews.**

It is likely that more tailored funding models would be better suited to developing shared hydrogen networks and storage, which have different operating models and costs to hydrogen production technologies. It will be critical to ensure that adequate funding is committed both to production and to distribution and storage to support the development of a robust and competitive hydrogen market, and that the models require transparent and open access to transportation and storage.