REA Hydrogen Working Group Meeting: 10:30, 23/03/21

Attendees:

Alexander Marshall (Clarke Energy)	Pat Costello (Intelligent Green Energy)
Alison Cartwright (CNG Services)	Paul Preston Reynolds Logistics
Andrew Winship (Air Liquide)	Steve Jones (Bayo Tech)
Andy Cornell (ABSL)	Stuart Easterbrook (Cadent)
Duncan Valentine (Almax Partners)	William Mezzullo (Foresight Group)
Hywel Lloyd (Active Building Centre)	Kiara Zennaro (REA)
Jack Rickard (Bioenergy Infrastructure Group/BIG)	Frank Gordon (REA)
John Baldwin (CNG Services)	George Li (REA)
Luke Tan (Supercritical Solutions)	Isobel Morris (REA)
Marcus Newborough (ITM Power)	Jesse Scharf (GGCS)
Mark Christensen (Reliagen)	Leo Marley (REA)
Mark Redwood (Fitchner)	Nina Skorupska (REA)
Martin Williams (Ricardo)	Paul Thompson (REA)
Matt Bird (Supercritical Solutions)	Sam Tickle (REA)
Michael Chesshire (Lutra)	Stan Fielding (REA)
Mike Cairns Terry (Progressive Energy)	Stuart Pocock (REA)
Nathan Burton (Storengy)	Syed Ahmed (GGCS)
Oksana Price (BDB Pitmans)	
Oliver Chesser (Supercritical Solutions)	

Introduction:

The Chair of the REA Green Gas Forum (William Mezzullo) and the REA Director of Policy Frank Gordon introduced the new Hydrogen Working of the REA, setting out how it fits into the REA Strategy. The working group lead is Kiara Zennaro (KZ), but other members of the REA Policy team will feed into the work. Each attendee introduced themselves.

BEIS Hydrogen Policy:

KZ highlighted the key commitments on gas and hydrogen set out by the Government in the Energy White Paper and Industrial Decarbonisation Strategy. They are all listed on the slides that were sent to members on 25th March.

KZ also gave an update on a meeting she and Frank Gordon had on Monday 22nd March with the BEIS teams leading on the Hydrogen business model work and the Net Zero Hydrogen Fund (NZHF). The REA team also approached the team at BEIS leading on the Hydrogen

Strategy. This is a very small team, very busy, with resources focusing on the hydrogen strategy that they intend to bring forward in the first half of the year. In the coming weeks they will be thinking about engagement pre- and post-consultation and they will let the REA know of any engagement opportunities.

Key points from meeting:

BEIS Business model revenue scheme work

- BEIS is developing a revenue support scheme designed to fill in the gap between the lifetime operating cost gap of low carbon hydrogen and higher carbon alternatives. They noted it is a very complex piece of work. It is a very complex value chain, a CfD type mechanism may be too simplistic in some cases.
- The revenue scheme will be designed to support both, green and blue hydrogen through a revenue mechanism – they refer to it as a Twin Track approach.
- The consultation on it is expected later in 2021 – they will seek feedback on their preferred design. Focused on production, so it is not expected to propose specific new end user mechanisms though it will consider how the different mechanisms fit together.
- Support for blue hydrogen may well follow the forms set out in their cluster sequencing work (a consultation on supporting CCUS enabled Hydrogen Clusters was published in February building on their work on business models for CCUS clusters). Green projects could be more of a CfD style process or a contractual arrangement. However, they noted that a lengthy contract may suit very large projects but not necessarily smaller green hydrogen production projects (e.g. 1 MW).
- BEIS are still trying to improve their understanding of the green hydrogen landscape and have recently launched a survey to understand more about it. Link included in slides and email sent out to members on 25th March.
- They are looking at developing eligibility criteria for the scheme. Key questions include:
    - Additionality. They are minded to only support green hydrogen production if the green electricity used is additional (ie not diverted from the electricity grid). Interested in stakeholders' views on it.
    - They are considering which sectors they should support. For example, hydrogen for transport is already supported through the RTFO, so should BEIS include too?
    - They want to make sure that Hydrogen is used only where is the technically superior option (e.g. better than electrification) and to ensure it has been used efficiently.
    - How to make the measures technology neutral and allow for future innovation?

- Allocation: their current thinking is that this should be a competitive process.
- BEIS would be interested to know whether they need more of a demonstration project proof of concept to understand how the supply chain works for green hydrogen. Asking whether Is capex for Concept projects needed or useful or is revenue support preferred?
- They are aware that there is a team at BEIS that has consulted on a longer-term support for green gases (ie in the GGSS consultation). There is a colleague in the team whose full time job is to link with other teams developing policies on hydrogen. Different parts of BEIS are working at different speed.
- They have invited the REA to join the Business Model Expert Group which meets once a month.

Action: Views from members welcome on allocation and all the eligibility criteria listed above.

BEIS Net-Zero Hydrogen Fund

- The Fund is to provide £240m of capital co-investment up to 2025 – so investment alongside industry. Period 2021/22 to 2024/25.
- They are designing the rules around this now, a consultation is expected in the next few months (in June) and launch 'asap this year'. The consultation should give an opportunity to provide early feedback on the design of the scheme.
- Like for the business models work, again looking to support both green and blue H_2 (Twin Track approach)
- Going forward this will replace the low carbon hydrogen fund (LCHF)
- It provides an opportunity to get some projects over the line now – in the short term, whilst a longer-term revenue mechanism is developed.
- BEIS would welcome if the REA gauge members views on the green H_2 landscape through the survey they launched (survey sent to members on 25th March).
- They are looking at the same range of eligibility criteria as per the business models work.
- They will work out how the Fund interacts with the business models work. It may be possible to combine this capital funding with the longer-term revenue support of the Business Models funding (ie help for initial investment and then a revenue value that goes up and down based on the fuel costs).

Comments on current BEIS policy from members

SE noted that there will be different answers to the question of additionality depending on whether we are looking at the short or long term. In the longer term, as there will be more potential for curtailment from renewables, hydrogen is going to play a significant role.

MN highlighted that low wholesale prices are already happening on the grid when renewables are high and demand is low, and this is a disincentive for more renewable electricity deployment. So green hydrogen production at those times on the grid is helpful to integrate more renewables. It is a potential asset to the continued integration of renewables into the power grid and this message needs to be conveyed to BEIS. If they stick to the additionality principle, then green H_2 cannot be produced until a new solar or wind farm is built. This is a significant impediment to do things in the earliest years.

SJ asked whether BEIS is considering using biomethane as a feedstock for hydrogen production. KZ said biohydrogen has not been explicitly mentioned by BEIS. They seem to be focusing on blue and green.

AM asked how BEIS sees the interaction between hydrogen and biomethane in the gas distribution network. He also asked how BEIS see hydrogen and/or biomethane in the decarbonisation of gas peaking stations. Initial impression is that they see the two gases as complementary, and we know they see biomethane as a low-regret option available now to help decarbonise the grid and intend to continue to support it.

Action: KZ to raise Biohydrogen with BEIS and make the point that biohydrogen needs to feature in the Government agenda/business models work.

Action: KZ to raise the questions on biohydrogen use ad gas peaking plants to BEIS.

Transport & RTFO:

PT provided an overview on the RTFO and expected consultation (post meeting note: now released).

The RTFO has been in place since 2008, modelled on the Renewables Obligation. It is still open, with a target set out to 2032. It doesn't accredit producer installations ie there is not grandfathering like in the RHI and other Government support mechanisms. The RTFO is purely a mechanism that creates a market for the certificates. If tomorrow the policy is closed, there will be no grandfathering.

It gives double counting for certain feedstocks (broadly wastes). There is also a development fuel target. For this, it needs to be made by an eligible pathway (something that would have been double counted such as from waste feedstocks or RFNBO) and must be a certain fuel type (incl. hydrogen and SAF). Development fuels have a different sub-target and a higher buy-out price.

There is a consultation on the RTFO expected,(now released, here: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/973041/targeting-net-zero-rtfo.pdf). The DfT want the changes implemented by January 2022.

What do we expect in the consultation: an increase in the target, to balance out the introduction of E10 (10% blend of ethanol) due to happen in September. Not expected to set targets beyond 2032. DfT are also planning to make changes to sustainability rules and understand to what extent they want to align with RED II.

They are also discussing changes for how they treat hydrogen. Firstly, on biohydrogen: initially they wanted to downgrade hydrogen from SMR of biomethane from development to ordinary fuels (a blanket argument). We would expect to make an argument that there should be a differentiation depending on sources (e.g. renewable/non-renewable source). For hydrogen from electrolysis, if grid electricity is used then by default you need to use the two years grid average carbon intensity (UK national average) which makes it difficult to meet GHG emission thresholds. You can justify using a lower number if, for example, you can demonstrate that the electricity you are using would have been otherwise constrained off the grid. However, no guidance is available from DfT on how to do that.

Also, based on the additionality principle, DfT only allow electricity from a wind farm that was built after the date the electrolyser was commissioned. Crude interpretation detracts people from delivering other benefits such as grid balancing etc. They are looking to allow more flexibility by introducing PPA / contractual arrangements.

WM asked whether, similarly to the Hydrogen Strategy, we can expect DfT to do something similar in transport. PT clarified that hydrogen thinking is very high level within the DfT. DfT are part of it but not leading on it so probably not at this stage.

Action: PT to discuss with MN and other members, rules around eligibility of green hydrogen as soon as the consultation comes out. Also, PT to discuss with other members involved in biohydrogen about related proposals in the consultation.

REA's Hydrogen Position:

KZ highlighted the position of the REA on different types of hydrogen, as set out in our position statement.

AM asked how grey hydrogen is defined. Clarke Energy has a number of installations globally on smelters, which produce grey hydrogen as a by-product. He thinks if the smelter is fuelled by a renewable energy, we should support it. NS confirmed we would consider this positively, as it is a by-product rather than a direct product made without due regard to the emissions.

MN asked how an association supporting renewable energy can support non-renewable, blue hydrogen from fossil fuels. NS and FG said we only support it if the carbon is fully captured and permanently stored and fully tracked, and to help manage the transition – as a transitionary technology only. Carbon accounting is key. Our heart, however, sits within green hydrogen and bio-hydrogen and also utilising the waste materials as a valued resource for a fuel that will ultimately decarbonise our economy.

MN suggested we should have a hierarchy or priorities. He said there is a danger that this position is being interpreted as being conflicting. We can make a lot of hydrogen without fossil fuels. We can also be positive about CCS with BECCS or direct air capture. He highlighted that we need a better definition of the green hydrogen pathway, the bio-hydrogen with negative emissions, direct carbon capture and have a clear distinction from blue hydrogen. It is important to appreciate those differences and give clear definition and priorities.

MCT noted that if we are going to do hydrogen at scale in the near term, we need the blue hydrogen pathway to get the infrastructure in place. Progressive Energy are glad that the position of the REA is more pragmatic. Blue hydrogen is a technology that can deliver significant GHG emission reductions in the near term.

There was a question about the REA's view on measures/standards for fugitive losses from a given process. NS re-iterated that we need to track the GHG emissions, not just the carbon, under a cradle-to-cradle view of what underpins the hydrogen economy.

A member asked if we have figures on the number of smelters in the UK powered by renewables. AM stated there are only two in the UK, Port Talbot, and the one closed in the North East. So only Port Talbot ongoing.

Another member asked whether H_2 made from an energy crop counts as a development fuel. Other policies like RHI don't support energy crops.

PT answered that some specific energy crops can be double rewarded (short rotation coppice and miscanthus) under the RTFO. DfT has published a list with their emerging thinking. In the process guidance, however, the development fuel list is only limited to double rewarded waste and residues with some exclusions, so not in that case.

Action: PT to send the link to the relevant information / section of the process guidance.

Discussion of Key REA Policy Asks:

KZ went through the key policy asks in the REA's position statement (see REA's slides).

Exempting electrolysers from use of system fees

FG clarified that, when charging and discharging from the grid, storage devices in the past were paying fees for both these activities on a gross basis. However, there have been grid modifications made that allow them to be charged only on a net usage basis. This recognises the fact they are aiding the electricity system flexibility. Could a similar approach be applied to hydrogen electrolysers that are grid connected?

Consider defining permissible ownership and operating models for Power to Gas (P2G) so that renewable hydrogen can be injected into gas networks (either legislation is required to establish rules for third party P2G operators on a commercial basis, or legislation to make P2G part of the regulated asset base).

MN noted that the electrolyser manufacturers don't particularly wish to own power to gas systems. However, it is critical to look over both, the electricity side and the gas side of the equation, given that the business case for this depends on the cost of electricity on the one side, and the value of hydrogen when sold to the gas networks on the other side. Lots of permutations there that can look economically attractive and can bring third parties over. Many people discuss these aspects but only from the electricity side or the gas side. REA can take a look at both, uniquely.

Waive VAT on renewable hydrogen for transport applications until 2030, or charge at the lower rate of 5% (as applied to Energy Saving Materials)

PT said we need to be cautious about tax treatment, both with regard to VAT and also fuel duty. Firstly, DfT are reluctant to look at fuel duty and taxes, as it is not within their control, but rather Treasury make the decisions. Secondly, unless policies are set out for a long way ahead, there is uncertainty on whether it will send the right signal to the market/developers.

Thirdly, it is challenging to differentiate a tax treatment on the basis of the fuel sustainability (e.g. if the fuel duty was made cheaper for bioethanol, no differentiation would apply between sustainable and non-sustainable bioethanol).

AC made the point that hydrogen for heat is more expensive than natural gas, so there needs to be an incentive like a feed-in tariff that underpins the business case for hydrogen and fundamentally improves the proposition for hydrogen, regardless of whether the VAT treatment is changed or not. His biggest ask is therefore that any support planned for blue/green hydrogen includes biohydrogen from gasification and SMR of biomethane. The danger is that this will be overlooked by BEIS. This should be the focus of the REA, to ensure the revenue scheme BEIS is developing has the right structure and covers biohydrogen from gasification and SMT of biomethane as well as green and blue hydrogen.

Action: REA to raise this point to BEIS, to ensure bio-hydrogen is not overlooked in the business models work.

Sort the billing methodology (Gas (Calculation of Thermal Energy) Regulations (CoTER)) to allow blending of hydrogen into the distribution network without the need to add significant propane.

MC asked whether, given the very low volumetric CV of Hydrogen, there needs to be a very high level of propane injection. KZ said this needs to be addressed at some point in the near future and the ENA's Entry Consumer Forum is looking at it. SE commented that propanation is not realistic nor practical for 20% H_2 blending so this is why Cadent and other networks are looking at reviewing the billing methodology and have something in place that works better, both for biomethane and hydrogen.

Next Steps:

- REA will circulate slides and minutes from the meeting
- REA will set out paper with the REA members' views on the revenue scheme for hydrogen, appropriate structure and eligibility criteria.
- Members to provide KZ with any comments on revenue scheme models.

Copy of Q&A / comments from the chat made by members (verbatim)

When BEIS mention 'green hydrogen projects' do they envisage existing renewables could be used to create green hydrogen or do they expect green hydrogen to be delivered from new renewable installations (i.e. not subsidised)? (WM)

When BEIS talks about hydrogen - are they considering supporting biomethane as a feedstock to hydrogen production? (Steve Jones)

Does REA feel DfT and BEIS are leading a coordinated effort on hydrogen or are they working independently on targets/aspirations? (WM)

Low strike prices for renewables are based on unconstrained operation. I believe the CfD contracts have reopeners on the price if plant is curtailed. 15% curtailment means renewable energy cost is 15% higher (Stuart Easterbrook)

How does BEIS see the interaction between hydrogen and biomethane in the gas distribution network? How does BEIS see hydrogen and or biomethane in the decarbonisation of gas peaking stations? (Alexander Marshall)

Additionality principle in the short term is a key aspect to unpick. I agree with Marcus about how Hydrogen can provide an opportunity to avoid the need to curtail renewable power generation where the choice of how to use the excess renewable power (as we will see more happening in summer) across energy storage technologies (via batteries or produce H2 or other longer term storage). We do not wish to waste excess renewable power and support/create the market conditions to add further renewable generation. Creating a market/support mechanism with BEIS as we transition to a range of new technologies will be key. The REA has a lot of experience of progressing this with our members. (NMS)

Does it not depend what one means by grey hydrogen - When smelting metals hydrogen is released as a by-product and this smelter is fuelled by renewable energy how are you classifying the hydrogen released? (Alexander Marshall).

Why does an RE Association support non-RE blue hydrogen? (Marcus Newborugh) – REA explained the rationale and need for this purely to be used as a short term bridging technology, I certain circumstances only.

What about measures/standards for fugitive losses from a given process? (Matt Bird).

Do we have figures on how many smelters in the UK are powered by Renewables? (Vijay Shinde).

Would H2 made from an energy crop count as a Development Fuel? Other policies like RHI don't support energy crops. (Mark Redwood).

If we support a hydrogen economy, across sectors, it will not be a case of an either/or question in the short to medium term, as you will need all of it to establish a secure and reliable energy supply. Longer term, you will then be able to grow more renewables to replace the less-green hydrogen. Supporting hydrogen now, will mean a much greater role for renewables in the longer term. (Stuart Easterbrook)

Another member commented that if Blue Hydrogen is generally cheaper than Green Hydrogen, even after a ca. 40% parasitic energy requirement for steam reformation, this competes unsustainably and the 'learning curve' needs to be "given" to Green Hydrogen; to bring down costs (like we've seen in solar PV and Lithium-ion batteries, etc). CCS still has a lot to be proven and actual 'storage' capacity is not infinite across the EU (although the UK has better than average). Therefore, if the REA do support non-RE Blue Hydrogen, then CCS realities need to be carefully considered as well it was argued. Perhaps involve the CCS Association to open up the

discussion before committing to supporting [conditional] Blue Hydrogen (maybe only RE forms of methane)? It's still a complex subject, so more discussion is needed…

What is to happen when there is no gas network, especially for transport/public services in rural areas (Paul Preston).

Yes, but EIS is supposed to be for supporting 'innovation' as Patient Capital, but got used to build AD plants etc following 'bankability' criteria, so employed 20 year old technologies, with little innovation in pre-treatment or post-treatment advances to 'conventional' AD. Therefore, a tiered structure is far better when it comes to EIS/VCT, otherwise inefficiencies get 'baked' in just to suit the risk averse approach of debt financiers (driven by equity providers). Generally speaking of course. There have been some novel step changes, but these were driven by revenue incentives, not necessarily good science and sustainability improvements/criteria. Therefore, EIS/VCT should be for the more efficient and sustainable versions of H2….LCA transparency is key… (Mark Christensen)

Needs to be an incentive similar to FiT for heat from hydrogen - need to do something that fundamentally improves the proposition for hydrogen, whether you change VAT or not (Andy).

One further issue to mention is that as more corporates sign up to Net Zero targets - and enter into long term contracts for renewable fuel supplies (and supporting new/additional generation) - they are increasingly sophisticated about what fuels they wish to purchase as they are sensitive to criticism. (Syed Ahmed).