Hydrogen APPG, 14th December 2021

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THE ASSOCIATION FOR RENEWABLE ENERGY & CLEAN TECHNOLOGY

REA's key policy asks to deliver a clean hydrogen economy

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REA

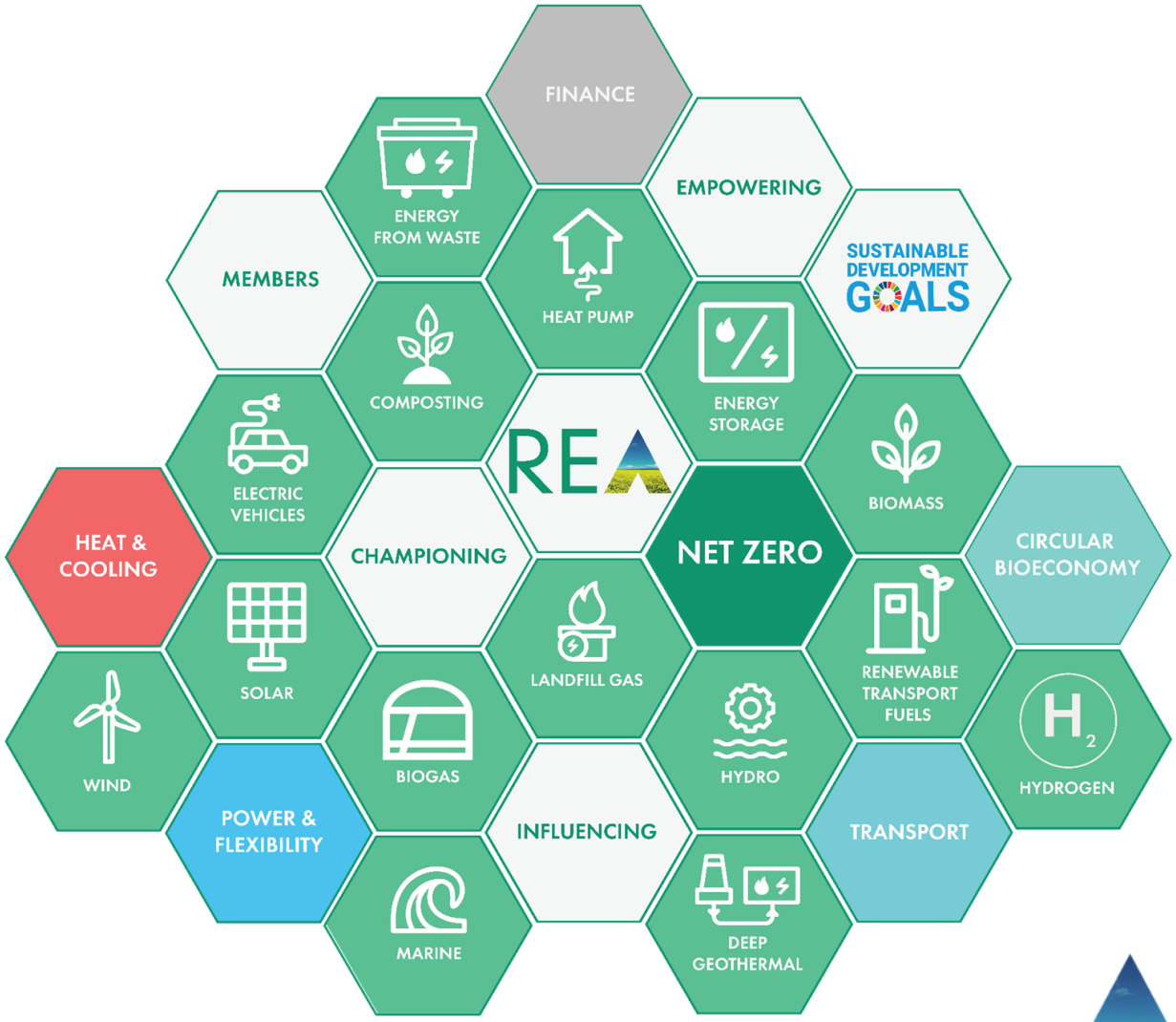
GREEN GAS HYDROGEN

Decarbonising the economy

Who we are...

Our Subsidiaries

We are the *largest* trade association for renewable energy and clean technologies.



How we represent *Hydrogen*

REAL
RENEWABLE ENERGY ASSURANCE LIMITED

GreenGas
CERTIFICATION SCHEME

Guarantees of Origin

REA GREEN GAS

H_2 HYDROGEN

Moving the hydrogen agenda forward

REA TRANSPORT FUELS

REA ENERGY STORAGE

REA SOLAR

REA WASTE TO ENERGY

REA INTERNATIONAL

REA FINANCE FORUM

A whole system approach

To put things in context…

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Hydrogen has a key role to play in decarbonising the economy:

- Hydrogen is a *carbon free* molecule that can be used as a energy carrier and storage, feedstock and fuel, with the potential to decarbonise challenging sectors:
  - ✓ Industry - ammonia, steel, cement, lime, refineries, distilleries etc.
  - ✓ Transport - heavy freight, marine and aviation
  - ✓ Flexible power generation
  - ✓ Heat – *hard-to-electrify* buildings
  - ✓ Large-scale storage

- UK Government's ambition to deliver **5 GW** hydrogen production capacity **by 2030**, expected to provide up to **42 TWh** of low carbon hydrogen.
- CCC's Sixth Carbon Budget report suggests hydrogen production will scale up to **90 TWh by 2035**.
- BEIS analysis (2021): the UK could require **250 – 460 TWh by 2050**, making up between 20 -35% of the final energy consumption.
- Hydrogen used today is largely produced from fossil fuels, **unabated.**

Supply chain complexity

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***Zero emissions at the point of use**, but supply chain emissions vary wildly:*

- Several potential inputs to make hydrogen, e.g.:
  - ✓ Water and electricity from grid, renewables, nuclear or fossil
  - ✓ Biomass, wastes, biogas / biomethane etc.
  - ✓ Natural gas (imported LNG, continental shelf etc.)
- Several potential pathways, e.g.:
  - ✓ Electrolysis
  - ✓ Gasification with or without carbon capture
  - ✓ Steam methane reformation with or without carbon capture
  - ✓ Autothermal reformation with or without carbon capture
  - ✓ Pyrolysis (methane)

- Multiple end-use fuels and products, e.g.:
  - ✓ Hydrogen
  - ✓ E-fuels – liquid or gaseous
  - ✓ Chemicals (ammonia, methanol etc.)

- Different transportation / distribution modes

REA position on Hydrogen

Grey hydrogen	*Blue* hydrogen	*Renewable hydrogen*
• We **do not support**, as significantly polluting in terms of GHG emissions	• We **support** as a **transition** technology, **if carbon is fully captured, stored or utilised in an application where the carbon is permanently sequestered**.	• **Zero** (if from 100% RE) or even **negative emissions** (biohydrogen combined with CCS). • REA **strongly support** these pathways as they represent truly zero or negative GHG emission forms of hydrogen production.

- ✓ *Lots of other colours and shades: pink, turquoise, white, yellow etc.*
- ✓ *Other pathways e.g. waste plastics to hydrogen*
- ✓ *Moving away from colours - regardless of pathway, carbon should be tracked, monitored and fully accounted for*

1. A credible low-carbon hydrogen standard

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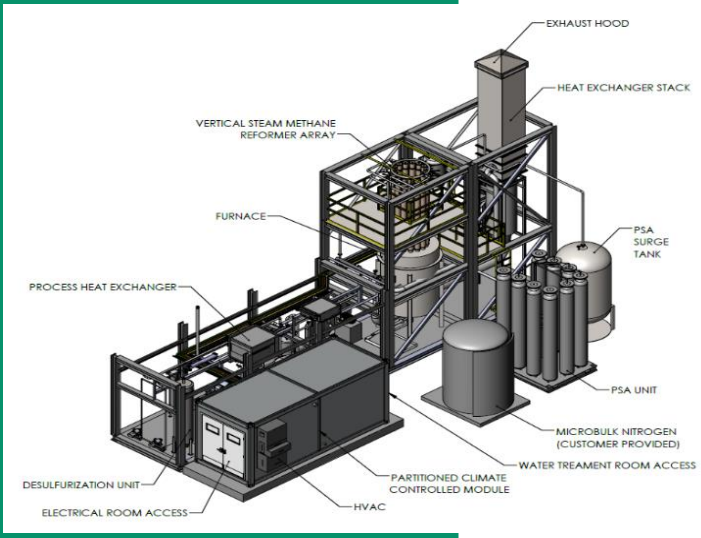
- *There needs to be a **robust and credible low-carbon hydrogen standard** that underpins development, along with an independent certification scheme*
  - ✓ Robust methodology for carbon accounting
  - ✓ Trajectory of standard to be aligned to net zero
  - ✓ Appetite for a standard that recognises different levels of GHG emission savings

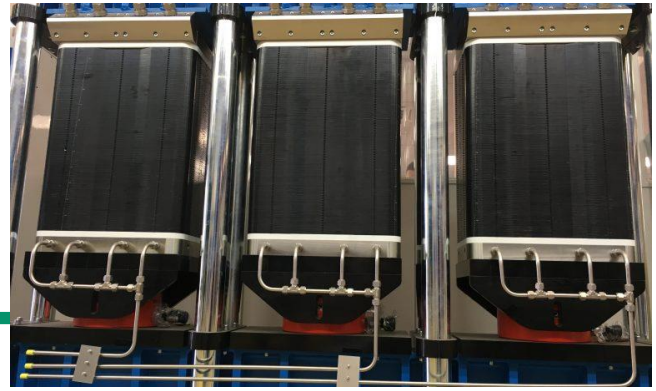
2. Targets and/or mandates

- *To underpin investment in low carbon hydrogen, Government policy need to be coupled with **dedicated targets** for renewable hydrogen and **targets/mandates for specific sectors**.*
  - ✓ Last month Germany doubled its 2030 target of green hydrogen capacity to 10GW, which is ~ 30 TWh (50% load factor).
  - ✓ UK could target as a minimum *5 GW renewable hydrogen capacity by 2030* (~ 15 TWh, 50% load factor), with individual sector targets, e.g.
    - ✓ 1 GW deployed in refineries
    - ✓ 1 GW of deployed in other industrial applications
    - ✓ 1 GW in transport, and
    - ✓ 2 GW injected in the gas grid
  - ✓ Mandate adoption of renewable hydrogen or introduce individual targets in hard to abate industry applications e.g. target of 25% decarbonisation in refineries by 2030.
- *Need for a **co-ordinated and joined-up** approach across Government departments and alignment with EU.*

3. Wide range of scales needed

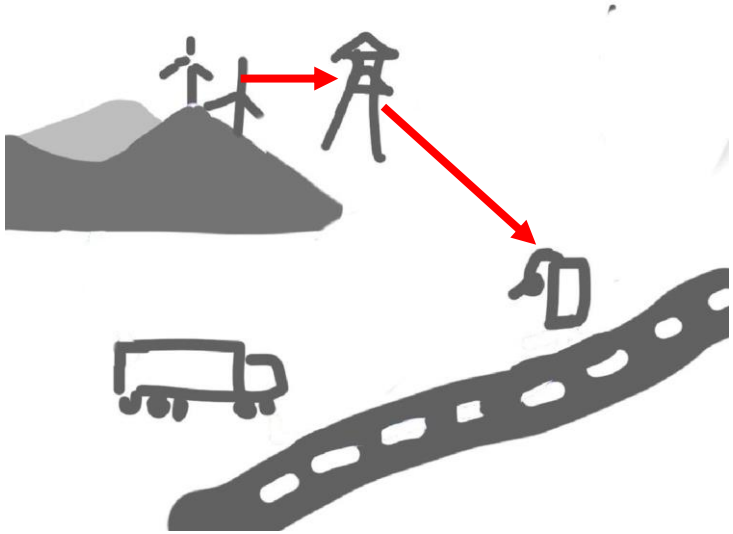
- ***Wide range of scales and projects types*** *needed in the UK to build a functioning Hydrogen economy:*
  - ✓ Smaller scale, decentralised projects key to kick start the market and can be deployed rapidly
  - ✓ Any Government financial support mechanism (e.g. business models) should target <u>small as well as large-scale</u>.





4. Pragmatic rules on electricity inputs and additionality

- *Any rules to account for **electricity inputs** to low carbon hydrogen production need to be **workable and pragmatic**, not to constrain the sector in the early years of development,* recognising that:
  - ✓ The grid is rapidly decarbonising – average grid carbon intensity will reduce.
  - ✓ Green hydrogen has a key role to play to enable the **integration of increased shares of renewables in the system**.



5. Reducing costs of grid electricity

- *Measures to **reduce the cost of electricity** for grid connected electrolysers:*
  - ✓ Significant costs are added to electricity bills by green levies and system fees
  - ✓ Exempting electrolysers from:
    - 'green levies' on electricity bills – i.e. electrolysis could be on the list as energy intensive users (see EII Scheme)
    - use of system fees - on a time limited basis, or adopting an approach similar to the rules for grid balancing charges borne by energy storage assets
  - ✓ Upcoming Government's *Fairness and Affordability Call for Evidence* could consider these.

6. Support for large-scale hydrogen storage

- *Introduce a **financial support mechanism** such as a Regulatory Asset Base (RAB) model to support investment in **geological storage**.*
  - ✓ Large-scale hydrogen storage will be required to improve our energy system resilience and flexibility
  - ✓ **12 -51 TWh** of hydrogen storage required by 2050 (NG's Future Energy Scenarios, 2021)
  - ✓ Storage will help manage the increased shares of variable renewable sources in the power system grid and also the high seasonality of energy demand

Source: Centrica

7. Hydrogen injection

- *Support **hydrogen injection into the gas grid**:*
  - ✓ Green Gas Support Scheme could be adapted to include injection of low-carbon hydrogen molecules into the grid, **help displace natural gas.**
  - ✓ Inclusion of hydrogen in any long term policy for greening the gas grid that replaces the Green Gas Support Scheme.
  - ✓ Minimum blending target? EC Hydrogen and Gas Decarbonisation package may include minimum 5% H_2 blends into gas transmission networks.

Source:
ITM Power

Decarbonising heat: select highlights for hydrogen

- Confirmed ambition for all **new heating systems installed in existing UK homes from 2035** to be low carbon (in line with replacement cycle timelines).
- Potentially hydrogen-ready boilers in areas where clean hydrogen is available, but decisions on **role of hydrogen in heating** postponed until **2026.**
- Continue to invest in hydrogen heating – neighbourhood and village trials and plans for town pilot.
- Consult on the case for enabling, or requiring, **new natural gas boilers to be easily convertible to use hydrogen** ('hydrogen-ready') by 2026.
- Indicative assessment of the value for money case for **blending hydrogen** by autumn 2022, with a final policy decision likely to take place in **2023.**

✓*There is no silver bullet to decarbonise heat. Heat policy must focus on ensuring the right technology is used in the right situation.*

✓*Household and communities are at the heart of resolving the challenge of decarbonise heat. Decisions made need to be made in the best interest of the individuals and the communities.*

Thank you

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