

**APPG on Hydrogen**

Via email: [appghydrogen@connectpa.co.uk](mailto:appghydrogen@connectpa.co.uk)

Friday 12th June 2020

Dear Sirs

I write in response to your Inquiry into how the UK's hydrogen sector can help support the UK's economic recovery.

### Responsible, Economic, Clean Energy Recovery

The journey to economic recovery with the adoption of hydrogen as a viable energy vector will not be a single leap of faith with high investment and a simple major change ... but rather will be characterised by a series of smaller incremental yet significant steps to reach broad adoption. Reclaimed hydrogen from previously untreatable waste plastic through the implementation of Powerhouse Energy Group's transformative DMG technology is one such step.

Through the efficient recovery of the hydrogen within the plastic for use as clean transport fuel, power generation and as a chemical precursor, this technology tackles head on the major global environmental issue of ever-growing mountains of unrecyclable waste plastic heading into landfill, polluting our land and our oceans.

In addition to the above, reclaimed hydrogen produced by the DMG technology differs from hydrogen produced by other processes as it:

- Is self-sustaining without any external electrical power input required vs Green Hydrogen from electrolysis.
- Provides a small scale local distributed solution vs Blue Hydrogen from SMR with CCS.
- Does not require an expensive pipeline distribution network.
- Produces lower emissions with lower investment vs Grey Hydrogen from SMR.

### Waste or Resource ?

End of Life Plastic in the UK is an underutilised resource that is currently treated as a costly and challenging waste management issue as opposed to a revenue generating potential source of clean energy. The present-day fate of waste plastic does not maximise its energy recovery:

**Recycling** – <30% capability in UK and ~10% globally, with many mixed and contaminated plastics being economically challenging to recycle mechanically or chemically.

**Incineration** – low efficiency, wasteful and inefficient energy conversion, with high GHG emissions.

**Landfill** – unsustainable needing hundreds of years to degrade, while producing leachate and GHG emissions.

**Export** – shifting the problem, wasting the resource and a declining option as more countries refuse to accept this waste.

Global plastic production is forecast to rise, especially in the post COVID world, and it is from these wasted and polluting plastics that DMG technology efficiently reclaims their inherent and currently discarded hydrogen.

### Reclaimed Hydrogen from Waste Plastic with new British Technology

The term "DMG" is an abbreviation for "Distributed Modular Generation" which describes the nature of the process that can be deployed at community level providing waste management and energy generation services for local use.

The process, which is an innovative Advanced Conversion Technology, uses new proprietary control techniques in gasifying waste plastic to produce a syn-gas from which pure hydrogen and electrical power are generated.

This British developed technology has the benefit of addressing two of society's most pressing problems – the eradication of unrecyclable plastic waste and the production of clean hydrogen energy for fuel cell vehicles such as buses, trucks and cars.

### Government Strategic Planning Support for New Technologies

The UK legislature's current focus on alternative transport fuels is primarily on liquid fuels from biogenic feedstocks for use in conventional ICEs. However the shift to lower carbon transport and improved roadside air quality requirements will also necessitate the uptake of hydrogen fuel cell vehicles which can be powered by readily available hydrogen reclaimed from waste plastics at a local level. A key feature of DMG technology is that hydrogen can be generated and sold at local waste management sites without the need for an expensive distribution network.

This transformative technology is currently being developed in the Northwest of England as a commercial solution for the regeneration of unrecyclable plastic waste to produce competitively priced hydrogen. However in order to drive the early adoption of

this new technology in the UK with momentum and to maximise the value from the Hydrogen from Waste (HfW) potential will require support and encouragement from government.

We suggest that close alignment in strategic planning and technology selection is facilitated between government departments for waste and energy, with realistic expectations of how plastics will be handled against the available energy from 'biomass' sources within the UK without detriment to the sustainability of our food production.

### Growth in UK Jobs and Export Opportunities

Reclaimed hydrogen provides a fresh opportunity to deal with waste plastic within the UK to the benefit of the UK economy in job creation and in terms of the ongoing commitment to the substitution of direct fossil fuel energy production by an additional new and cleaner energy source.

The first full scale commercial application of the DMG Technology is in development at Protos Energy Park in the North West as the first step in Powerhouse's partnership with Peel Environmental which works with landowners, investors, operators, contractors and technology providers to develop deliverable business models for waste and environmental technology projects. They are part of Peel L&P which is one of the UK's largest industrial site owners and operators. They have ambitious plans for rapid roll out of the DMG technology at additional sites, thereby creating British jobs in engineering, manufacturing, construction and operations from potentially hundreds of Hydrogen from Waste plants all across the UK.

Whilst the initial potential for applications in the UK is exciting, worldwide opportunities are also in abundance, demonstrated by the number of approaches that have been received from interested parties in Western Europe, Asia, Australia, and Latin America and elsewhere for this technology, as an efficient and economically attractive means of remediating plastic waste and producing hydrogen in economies facing similar challenges to the UK. The implementation of DMG technology presents the opportunity for highly qualified chemical engineering roles, skilled commercial and technical roles here in the UK as well as services to export outside the UK and Europe.

In conclusion, the opportunities are significant for the UK. As a country, we have the opportunity to become a world leader in innovative hydrogen technologies, such as Powerhouse's DMG technology, that have tremendous potential to deliver near and long term growth for the UK economy and to become an export driver for the nascent hydrogen economy worldwide.

Please do not hesitate to contact me for more information and the opportunity to discuss how PowerHouse Energy Group PLC can support growth in the UK economy.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'D Ryan', with a stylized flourish at the end.

David Ryan

FIET, FEI, FAPM, C.Eng., MBA, BSc  
CEO - PowerHouse Energy Group PLC