"A Smart, Flexible Energy System" Call for Evidence

Response from Fuel Cell Systems Ltd

Q35. What barriers, (regulatory or otherwise), are there to the use of hydrogen water electrolysis as a renewable energy storage medium?

Fuel Cell Systems agrees with the UKHFCA comments:

Conversion of electricity to hydrogen through water electrolysis and use of this hydrogen in the gas grid (P2G), mobility or industry can productively utilise nearly all excess renewable energy, contributing to decarbonisation, while offering grid balancing services. According to a recent study[1], the European potential for installed electrolyser capacity in 2050 high-RES scenarios would be in the hundreds of GWs.

Currently, the main barrier is the electrolyser cost; this will significantly improve with mass deployment and better utilization, as cheap excess power from low carbon sources is still limited.

Additionally, the market for the industrial and commercial use of high quality pure hydrogen, generated using wind or solar power, is undeveloped. The two main gas suppliers (BOC/Linde and Air Products), source and produce hydrogen largely from industrial processes such as steam methane reforming, rather than incur the cost of buying it from individual, renewable energy suppliers. There may be an argument for government to incentivise hydrogen production from renewable sources, making it a more cost effective option in the early market phase.

The cost of an electrolyser, coupled with the cost of commercialising hydrogen from renewables, in turn act as a barrier to growth in sectors such as the hydrogen fuel cell vehicle market, where establishment of a suitable refuelling network is key.

[1] http://www.fch.europa.eu/sites/default/files/CommercializationofEnergyStorageFinal_3.pdf

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