

Energy transition? Let's not forget the option of a Green Gas Grid

August 14, 2017



Green gas grid to be fed with biomethane

As a well-informed reader of EPW I am sure you know that electricity represents only about a fifth of our energy needs, whereas **heating and cooling** takes up almost half our energy consumption. And you also are aware that decarbonizing heating is a much bigger challenge than decarbonizing electricity.

We can of course **electrify** our heating and cooling systems, but that requires a lot of additional electricity generation, which all needs to be zero-carbon – and which will need to come on top of the additional zero-carbon electricity generation needed for our **electric cars**. Not an easy task.

It makes a lot of sense, therefore, to see whether we could **decarbonize the existing gas grid**, so that we can continue to use the gas grid to heat our homes and businesses. The **Sustainable Gas Institute of Imperial College London** has provided a great service by undertaking a study into the option for a “**green gas grid**”. They have come up with an [excellent report](#) as well as a very good [overview of the main findings](#).

I will summarize the key findings here.

- *There are significant benefits to decarbonising the gas network. For example, there is value to the existing assets, and in the inherent flexibility of gas. There is also a general consumer preference for gas appliances; and it is relatively low cost and easy to install gas-fired heating systems. However, the technical capabilities of existing networks, and the level of decarbonisation achievable, still need to be explored, and resulting costs remain uncertain.*
- *The storage potential of low carbon gas offers a significant advantage over electricity networks. Gas has relatively low-cost flexibility, particularly for seasonal fluctuations in energy demand. Per kilowatt-hour the cheapest forms of electricity storage are approximately four times more expensive than the highest cost estimates for hydrogen storage (salt caverns).*
- *Biomethane is the most compatible with existing gas networks and may deliver negative emissions. However, there are limitations on the future availability of biomass, used to generate biomethane.*
- *Hydrogen could be delivered through electrolysis from renewable energy without the need for carbon capture and storage (CCS). However, electrolysis is currently expensive relative to other methods, although it is likely that costs will decrease. Producing hydrogen through steam methane reformers (SMR) is scalable at relatively low cost. But using natural gas to generate hydrogen in SMR could increase gas demand by 15% to 66% per unit of energy delivered to consumers, relative to direct use of natural gas.*
- *The range of CO₂ emissions estimates for the different methods to produce low carbon gas is extremely large. The highest and most variable emissions come from fossil fuel routes to produce hydrogen that do not include CCS.*