

Renewable Gas

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Have you ever nodded along when people talk about "renewable gas" but not really understood what it meant? We get it, and we are here for you...

Biogas

Biogas is created from a variety of feedstocks: cow poop (yes, that's right), maize, silage, sewage and food waste.

When captured it can be purified and turned into **biomethane** which can then be used for generating energy. At a local and individual farm scale, this approach could be a solution for harnessing energy.

But the challenges of Biogas are as follows:

- If burnt, it releases Co₂ and can leak methane.
- It legitimises a society where large quantities of waste are "useful"
- It could legitimise monocultures and factory farming (and this is already happening)
- It is costly to upgrade biogas to biomethane
- There are currently vastly different national requirements on how "pure" biomethane should be

NOTE: Agricultural and land use groups often have lots to say about biogas and **palm oil** is becoming a major source of biogas production.

Hydrogen

The creation of hydrogen requires energy (lots of it) and that is what defines its characteristics.

Hydrogen is useful as it is more easily stored, more efficient to transport, and only produces water when burned. However, depending on the energy used to make it, it can also be a greenhouse gas.

Grey Hydrogen: created using fossil fuels

Blue Hydrogen: created using fossil gas

Green Hydrogen: created using renewables

However, even green hydrogen has its challenges:

- Many argue that excess renewable energy should be used to create hydrogen which is easier to store, however, this adds an extra energy draining step in the process.
- Arguably energy inefficient to use up renewables for the creation of hydrogen
- Hydrogen has to be transported in plastic pipes because it is moved at a different pressure to biogas and synthetic methane.

Synthetic Methane

Synthetic Methane is essentially methane made in a factory. It requires hydrogen to be made, carbon added, a bunch of chemical reactions and then, bob's your uncle = methane.

This process also tends to rely heavily on **carbon capture storage (CCS)** which is still not feasible on a large scale, and legitimises the emission of harmful greenhouse gases in the first place.

Synthetic Methane has other challenges such as:

- Being extremely expensive
- Releasing Co₂ when burned
- Questions about where we get the carbon from in the first place
- Methane leaks

NOTE: This is also referred to as Power2Gas

Carbon Capture Storage (CCS): is the process where carbon is prevented from entering the atmosphere from **industrial sources** or is removed from the atmosphere from **direct air capture**. However both these methods are still not viable at large scales.

You might also hear people talking about **decarbonised gas**. This is fossil fuel gas that is then decarbonised through CCS.

Summary

- Biogas is only feasible at the local level and could play a role in local level decarbonisation.
- Synthetic methane is still in the pilot stages, and is unlikely to be feasible.
- Hydrogen has been more explored than synthetic methane but creates challenges surrounding its energy sources.

Overall, biogas distracts from renewable energy developments, relies on huge technological advances and even the most ambitious estimates only predict that it would meet half of our current gas demand. So questions about where to use this small amount of energy are also likely to dominate the debate going forwards.