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The politics of renewable and decarbonised gas

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- How to evaluate different renewable and decarbonised gas options?
- The politics of the renewable and decarbonised gas and what can we do?

Renewable and decarbonised gas – parameters

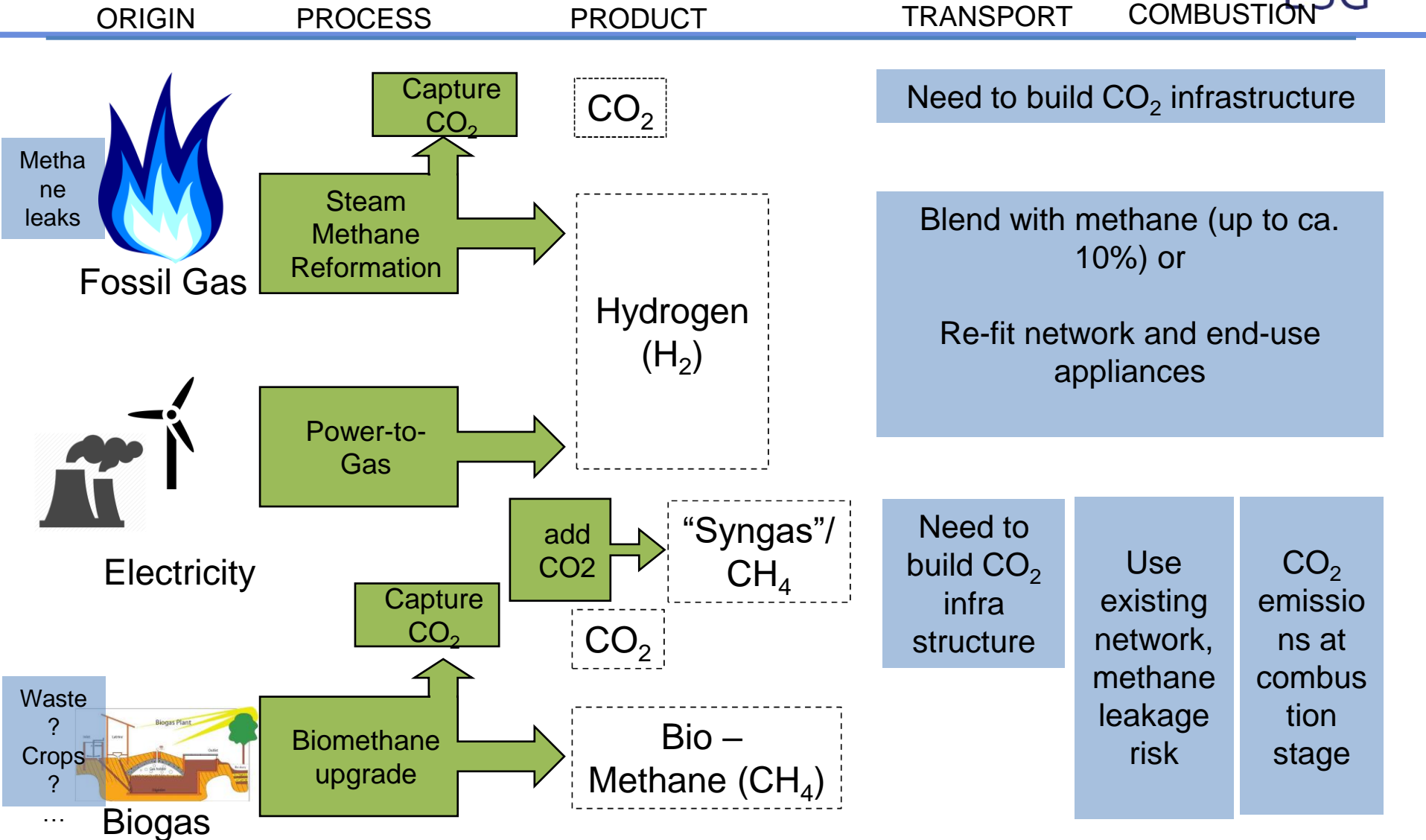


There's not a single, simple answer, but a few simple questions...

- Is it compatible with a **net-zero emissions system**?
- What's the **technical and economic potential** compared to today's gas consumption?
- What does it mean for today's **gas infrastructure network**?







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- **Not all forms of gases are compatible with a net-zero world**
- To become an effective contributor to a pathway to net zero emissions, these options would need to be **tied to a plan to phase out fossil gas**.
- Their **(domestic) supply potential is very limited** compared to today's gas consumption.
- In many, not all, cases **electrification and efficiency make much more economic sense**.
- In almost all cases, **significant modifications of today's gas infrastructure are needed**.

Scorecards

Steam Methane Reforming (SMR) + Carbon Capture and Storage (CCS)

Net-zero emissions		CO ₂ free end use if hydrogen, but emissions from fossil gas supply chain and reformation process that will be difficult to remove completely, even with CCS. Unlikely to be compatible with a net-zero emissions society.
Technical potential		Constrained by the availability of CO ₂ storage sites.
Economic potential		Cheapest form of low carbon gas without CCS, but cost of CCS highly uncertain (current estimate at about 30% cost increase, i.e. not competitive with direct use of fossil gas)
Network impacts		<ul style="list-style-type: none"> Hydrogen requires modification of network. Requires addition of CO₂ transport infrastructure. Utilisation rate of the network could remain high if enough carbon is available.
Evidence needs Location and potential of CO ₂ storage infrastructure.		





Biogas/methane

Net-zero emissions		<ul style="list-style-type: none"> Requires strict definition of sustainability standards at plant and system level and clear rules for carbon accounting for biomass. Emissions from upgrading process, transportation and combustion.
Technical potential		Estimated at 50-98 bcm by 2050, unless imported. This is about 10-20% of today's gas consumption. Higher estimates require intensification of agricultural use of land.
Economic potential		<ul style="list-style-type: none"> Current cost (ca €100/MWh) is about 4 to 6 times higher than wholesale gas prices. Biomethane would only be able to compete with fossil gas if supported through specific policy instruments.
Network impacts		<ul style="list-style-type: none"> Utilisation rate: it won't provide for the same utilisation of the network. Depends on how much biomethane will be fed into the distribution and transmission grid at all instead of on-site consumption.

Evidence needs:

- Cost reduction potential
- Supply & consumption points compared to current network
- Acceptable sustainability criteria and associated carbon balance and potential.

Power-to-Gas (from renewable energy)

Net-zero emissions		<p><i>As hydrogen:</i> If based on entirely renewable energy, emissions from PtG are only from manufacturing processes of renewable energy. Extending the use of non-renewable electricity generation needs to be avoided.</p> <p><i>If methanised:</i> CO₂ injected will eventually be emitted, even if sourced as waste product. Alternative sourcing process very energy intensive.</p>
Technical potential		<ul style="list-style-type: none"> It is linked to the scale of deployment of renewables and whether it uses "excess" or "dedicated" capacity. So far, studies suggest limited domestic PtG potential, ranging from 24 to 30bcm, about 5-10% of today's gas consumption. Import volumes depend on renewable energy deployment outside Europe.
Economic potential		<ul style="list-style-type: none"> PtG will compete against alternatives such as interconnection, demand side response or SMR+CCS. The pace and scale of cost reduction will depend on dedicated policy measures to introduce PtG. <i>Methanation</i> would significantly add to the cost.
Network impacts		<ul style="list-style-type: none"> Utilisation rate: PtG on its own will provide very low volumes of gas compared to today's gas consumption. If used as hydrogen, the network would need to be adapted to become hydrogen compatible. As <i>methane</i>, additional CO₂ infrastructure would need to be provided.
Evidence needs Where will the renewable capacity come from? Are deployment rates fast enough to avoid extended use of coal? What network adaptations need to be made for hydrogen (hydrogen storage, end use appliances)? Where would the CO ₂ come from if methanation is considered?		

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What's happening?

Risk	Opportunity
Renewable & decarbonised gases are an excuse to continue business as usual network operation.	The discussion has made some gas companies publicly support net-zero emissions targets and exposed diverging interests of the European gas industry.
It is used to slow down electrification and efficiency efforts . In fact, renewable and decarbonised gases will first and foremost need to compete with fossil gas.	There are regional differences: in Italy & France it's all about biogas/methane, in UK and Norway about fossil based hydrogen and in the EU about Power-to-Gas.
Some new alliances might emerge that we need to watch closely, e.g. RES industry + gas industry.	

What we need to do?

- Avoid that the prospect of renewable & decarbonised gases **locks us into a business as usual approach to gas infrastructure.**
- Encourage gas companies to publicly support net-zero emissions targets, but push them to also **support the phase out of (unabated) fossil gas.**
- Shift the gas vs electrification story to one about **focussing renewable & decarbonised gases on where there is no other option.**
- **Engage & educate at national level** – NECPs, network planning exercises!
- **Ask for specifics** – be clear with RES industry, decision makers etc that not all RES gas is compatible with a net zero emissions world.



Where do we need to engage?

National

- National Energy and Climate Plans
- National infrastructure plans/10 year plans

International

- G20 in Japan
- CAN-I position on gas

EU

- Hydrogen declaration & Madrid forum
- EU gas market design
- EU infrastructure planning
- EU 2050 roadmap



Next Steps

1. Understanding the suitability of the existing infrastructure

2. Understanding the choices for a scarce resource

3. From endpoints to pathways

4. Ensuring sustainability at plant and at system level

EU roadmap/Member State long term plans: Numerous net-zero emissions scenarios with different levels of supply and demand for RES/decarbonised gas alongside electrification and efficiency.

Energy (gas) market design and EU budget: what instruments to introduce RES/decarbonised gas to the market and ensures no indirect support for fossil gas?

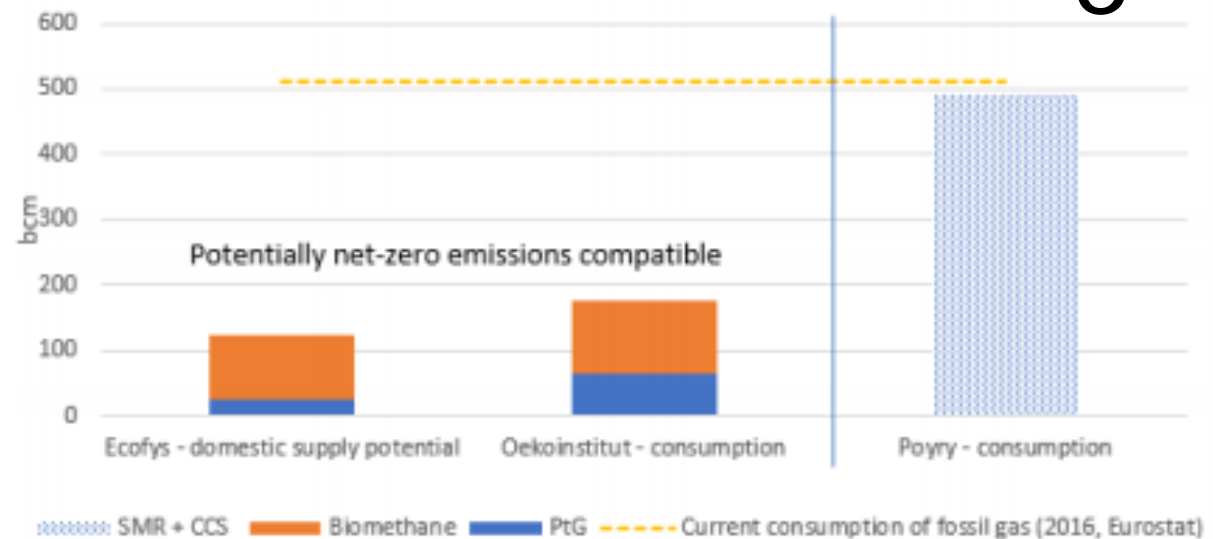
RED II + alternative fuels directive + ?

Policy recommendations

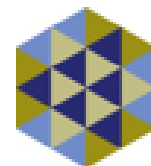


4 Highest value
Sector for
renewable &
decarbonised gas
resources?
Residential heat?
Transport? Industry?
Plastic production?
...

Figure 7 Renewable and decarbonised gas in 2050 (bcm)

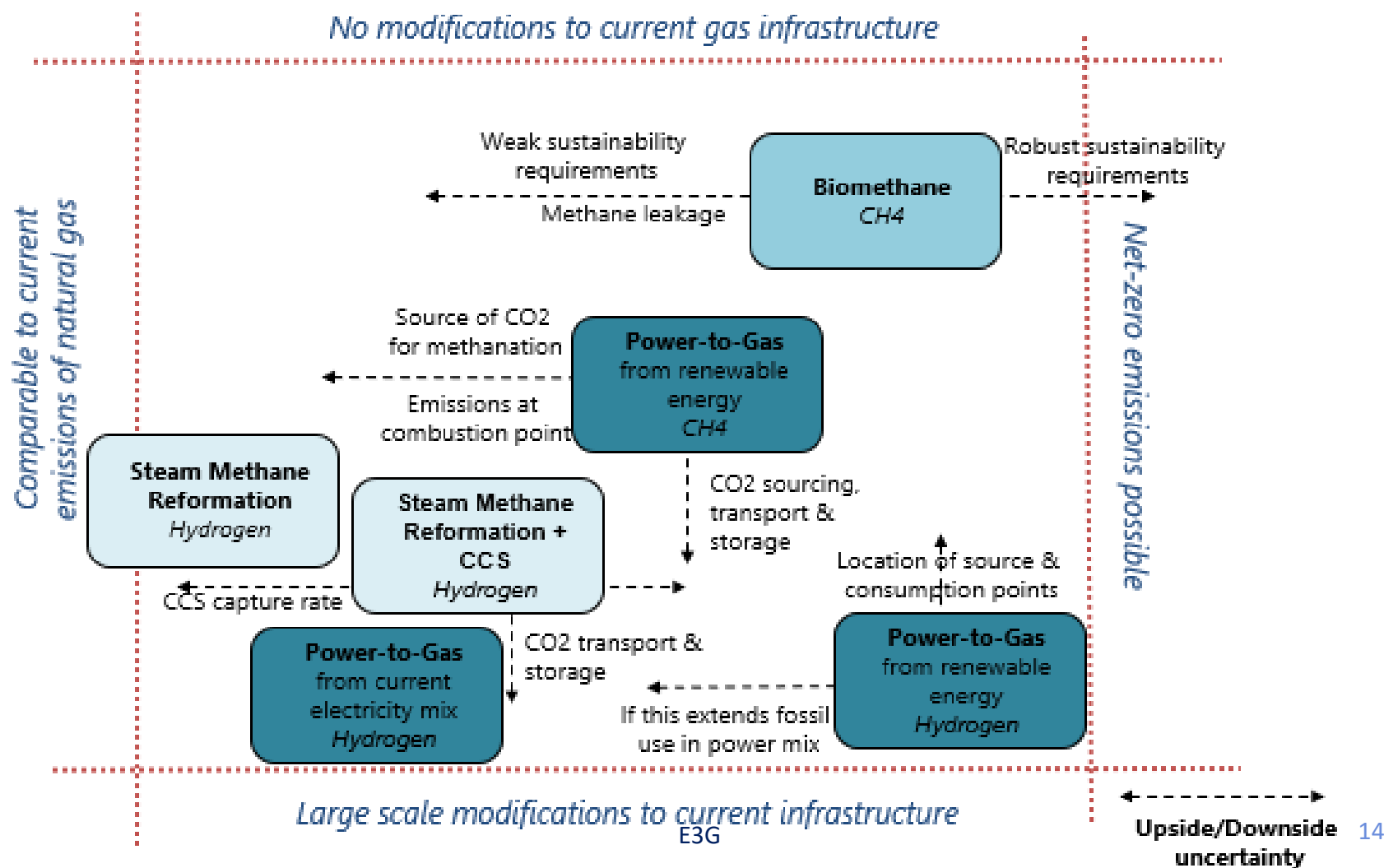


Source: Ecofys, Ökoinstitut, Pöry, Eurostat



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Clean and compatible?



About E3G

E3G is an independent climate change think tank operating to accelerate the global transition to a low carbon economy. E3G builds cross-sectoral coalitions to achieve carefully defined outcomes, chosen for their capacity to leverage change. E3G works closely with like-minded partners in government, politics, business, civil society, science, the media, public interest foundations and elsewhere. In 2016, E3G was ranked the number one environmental think tank in the UK.

More information is available at www.e3g.org