GAS FOR CLIMATE 2050: the role of gas in a decarbonized energy system

6th Ministerial Gas Forum Barcelona, 22 November 2018

KEES VAN DER LEUN



DEEP DECARBONISATION OF EU ENERGY SYSTEM NEEDED TO MEET CLIMATE GOALS

- In the 2015 Paris Agreement, 195 countries agreed to limit global warming to well below 2°C, and aim for 1.5°C
- To meet the target, studies show that the world should aim for net-zero carbon emissions by 2050
- This implies that countries (and the EU) need to decarbonise their energy systems



GAS FOR CLIMATE: A PATH TO 2050

The Gas for Climate initiative

A group of seven major European gas TSOs and two biogas associations which developed a vision on how to achieve a net zero EU energy system.

Gas for Climate sees an important role for renewable gas alongside renewable electricity.

gasforclimate2050.eu



The group consists of :



GAS FOR CLIMATE VISION: A NET ZERO GREENHOUSE GAS EU ENERGY SYSTEM BY 2050



Release date: 22 February 2018

Smart use of renewable gas to meet climate targets can save Europe €140 billion per year

- Study published today by the Gas for Climate initiative sets out plan to meet Paris Agreement target in a cost-effective way
- · Study sets out a vision for net zero greenhouse gas emissions in the EU by 2050
- Renewable gas used in existing infrastructure can be combined with renewable electricity to limit the cost of the energy transition

Renewable gas used in existing gas infrastructure could play an important role in reducing Europe's greenhouse gas emissions to net-zero by mid-century, according to a study published today by the Gas for Climate initiative. Such a reduction is needed to comply with the Paris Agreement to keep global warming well below 2°C, avoiding dangerous levels of climate chanse.

Initiated mid-2017, the Gas for Climate group consists of seven leading European gas transport or Fluxys, Gasunio, GRTgaz, Open Grid Europe, Snam and TIGF) and two renewable gas industry. (European Biogas Association and Consorzio Italiano Biogas). Gas for Climate is committed to ar greenhouse gas emissions in the EU by 2050 and the group commissioned Ecofys, a Navigant or a study into the future role of gas in a net-zero emissions energy system.

Their study shows that it is possible to scale up renewable gas production between now and 205 billion cubic metres annually, including both renewable hydrogen and biomethane. The biomethan based on an early and conservative scenario on the sustainable use of European biomass potent renewable gas in existing gas infrastructure for the heating of buildings, to produce dispatchable complement to wind and solar, and to fuel heavy transport and shipping, could save about €140 ± 2050 compared to a future energy system without any gas.

The CEOs of the nine Gas for Climate members (Piero Gattoni, CiB, Marcelino Oreja Arburúa, E Štambaský, EBA, Pascal De Buck, Fluxys, Han Fennema, Gasunie, Thierry Trouvé, GRTgaz, Dr Open Grid Europe, Marco Alverá, Snam and Dominique Mockly, TIGF) jointly declared:

"We are committed to achieve net zero greenhouse gas emissions in the EU by 2050 to meet the target. Renewable gas used in existing gas infrastructure can play an important role in this.

"We want to facilitate a large scale-up of EU produced renewable hydrogen and biomethane that is transported, stored and distributed through existing gas infrastructure to be used in our energy system in a smart combination with renewable electricity. This will help Europe to meet the Paris Agreement larget at the lowest possible costs while enhancing Europe's energy executy." The CEOs of all Gas for Climate member companies stated a bold commitment, positioning the consortium as **leader in the fight against climate change.**

This statement goes **further** than the current EU target of 80-95% reduction.

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GAS FOR CLIMATE VISION AND ACTIVITIES

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FIRST STEP: NAVIGANT STUDY TO ANSWER 2 QUESTIONS

To assess whether a future decarbonised energy system should include renewable gas, research by Navigant answered two key questions:

|--|

2 Cost Savings	To what extent can use of this gas through existing gas infrastructure decrease energy system costs in 2050?
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IT IS POSSIBLE TO SCALE UP EU BIOMETHANE PRODUCTION TO 98 BCM AND GREEN HYDROGEN TO AT LEAST 24 BCM

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Biomethane Potential 2050, per Feedstock Type



Hydrogen Potential 2050

24 bcm of hydrogen (in methane energy equivalent) can be produced from renewable electricity in the EU.

This only takes into account hydrogen from **surplus renewable electricity** that would otherwise be curtailed.

Source: Navigant

Additional potential is possible from, for example, seaweed as feedstock, from roundwood, and from imported biomethane.

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THIS RENEWABLE GAS CAN SIGNIFICANTLY REDUCE SYSTEM COSTS IN THREE KEY SWEET SPOTS



SIGNIFICANT ENERGY SYSTEM COST REDUCTIONS

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Summary of annual costs and cost difference by 2050 between the "no gas" and "with gas" scenarios (rounded) and resulting total annual societal cost savings achieved by using renewable gas in existing EU gas infrastructure.

Costs for:	Sector	No Gas (€ billion)	With Gas (€ billion)	Difference (€ billion)
Heating Technologies	Building	210	173	37
Insulation	Building	180	159	21
Energy Production for Heating	Building	61	67	-6
Gas Infrastructure Cost	Infrastructure	20	24	-4
Electricity Distribution Infrastructure	Infrastructure	31	30	1
Electricity Transmission Infrastructure	Infrastructure	70	65	5
Heat Infrastructure Cost for Heating	Infrastructure	37	37	0
Electricity Production	Energy	386	302	84
Total		995	857	138

COST SAVINGS

ACHIEVEMENTS GAS FOR CLIMATE TO DATE LAUNCH OF OUR STUDY AND WEBSITE IN FEBRUARY 2018

ACHIEVEMENTS GAS FOR CLIMATE TO DATE MEETINGS WITH 50+ EU POLICY MAKERS

We met with 30+ policy makers since Jan

- DG CLIMA: Tom van Ierland, Kostis Sakellaris
- DG AGRI: Mauro Poinelli
- DG ENER: Multiple units (9 policy makers)
- DG INNO: Philippe Tulkens
- DG MOVE: Isabelle Vandoorne
- Council: Janusz Bielecki
- German PermRep: Gisela Hohensee
- Spanish PermRep: Juan Arístegui Laborde
- EP ITRE: Jaromír Kohlíček
- EP ENVI: Bas Eickhout, Peter Liese, Filip Alexandru (Assistant to Ms. Valean)
- EP TRAN: Wim van de Camp

ACTION PLAN: SCALING UP RENEWABLE GAS REQUIRES ACTION STARTING TODAY

Gas for Climate presented its Action Plan to boost renewable gas to EU Commissioner for Climate & Energy Miguel Arias Cañete (*Brussels, Sept 2018*)

Thierry Trouvé, CEO of GRTgaz: "This Action Plan demonstrates our unequivocal commitment to the energy transition and decarbonisation of the European gas grid."

- Commitments to facilitate the scale-up of renewable gas
- 'To do list' for companies and policy makers up to 2030

INTERCONNECTED WORLD: HYDROGEN – PRODUCED IN EU AND/OR IMPORTED FROM MENA

Electrolyzer cost reductions may enable additional renewable electricity generation used to produce hydrogen.

Currently being analysed by Gas for Climate.

E.g. large scale production of green hydrogen and electricity from solar PV in the Middle-East and Northern Africa: local energy demand, plus transport hydrogen to the EU using gas infrastructure

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