

How to integrate renewable power in the natural gas grid – *how to convert fluctuating wind power and Biomass/biogas to biomethane – or “green” Natural Gas?*

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Background

WOC5 - 5A addresses ways in which renewable energy can contribute to retain gas as an important fuel for the residential, commercial, industrial and transport sector in a future without fossil natural gas.

Right now many governments are planning energy strategies with CO₂ reduction as primary goal. Many countries are even planning zero – or close to zero - CO₂ solution in 30 – 40 years, and calculate energy to come from renewable solutions like wind, sun, biomass, biogas, waves etc. One important question for these countries is – what will happen with the natural gas grid?

The natural gas grid is already established and do have a lot of advantages that can average out disadvantages combined with fluctuating renewable energy. The natural gas grid can

- absorb excess fluctuating renewable energy (as example wind power)
- deliver ancillary services to the (renewable) power system
- deliver storage (security of supply) for the renewable energy/ -power

“Green Natural Gas” or bio-methane can be produced through a range of different technologies. The most promising are:

- ✓ Technologies for upgrading of biogas to biomethane/“Green Natural Gas” through removal of CO₂ - already used in many countries
- ✓ The conversion of biomass to biomethane - under commercialization in some countries with excess bio mass (primarily wood)
- ✓ Conversion of CO₂ and H₂ to biomethane through “methanization” is still under development, but a very promising technology with a huge potential.

Method and Conclusion

WOC 5 went through globally leading experts to give an overview for these technologies – and discuss the perspectives around needed political support, economy, etc. in a special workshop - Expert Forum 5A.

The program for the Forum contains:

1. Introduction – how to convert fluctuating wind power and biomass to biomethane

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2. *Status for technologies and cost for production of biomethane ("Green Natural gas") by use of the SOEC technology.*

Professor Mogens Mogensen, DTU/Risoe, Denmark

3. *Upgrading of biogas to bio-methane ("Green natural gas") - technology and cost.*

"Development of organic waste water methane fermentation process and bio -methane utilization system" at Shojiro Osumi, Osaka Gas, Japan and

" The suitable purification technology for utilizing biogas effectively" at Tatsuo Kume, Osaka Gas, Japan

4. *Direct production of bio -methane through biomass gasification.*

Philippe Buchet, Gdf – Suez, France.

After these papers the Expert Forum will have a panel discussion:

Will - or should - "Green Natural Gas" be able fully to substitute fossil Natural Gas – when?

Where will "Green Natural Gas" be introduced first ?

Needed political conditions for "Green Natural Gas" to substitute fossil Natural Gas?

The panel will be: Alexey Zorya, Gazprom, Russia - Mohd-Fairos Roslan, Petronas Malaysia - Nuno Moreira, Dourogas, Portugal

+ all speakers