

Press release

Gas, over time turning 'green', will be instrumental and indispensable in all decarbonization scenarios

Gaseous molecules as energy carrier will be pivotal also for extensive electrification scenarios while a wider use of gas achieves Germany's decarbonization targets less drastically and less costly, a new paper by 'ewi Energy Research & Scenarios gGmbH' and 'The Gas Value Chain Company GmbH' demonstrates.

Cologne/Mülheim, 23 October 2018. The long-term relevance of gas - for quite a while fossil natural gas and towards deeper decarbonization scenarios increasingly 'green gas' - is vastly underrated by many. This is partly due to the considerable complexity of a multitude of studies and reports where the acknowledged relevance of gas can easily be overlooked. But also because gas is frequently put in the 'dirty fossil corner' all too quickly.

Against this backdrop 'ewi ER&S' and 'The Gas Value Chain Company' have extracted the considerations and arguments addressing the long-term relevance of gas in the decarbonizing German energy space in various studies, with strong focus on the 'dena-Leitstudie' "Integrierte Energiewende". They compare a scenario labelled "Electrons" - implying a high degree of electrification and lower use of gas - with a scenario labelled "Molecules", the latter implying a higher degree of direct gas use in all sectors.

The main findings of the paper are:

- Gaseous molecules as energy carrier will be instrumental and indispensable in both the Electrons and the Molecules scenarios all the way towards 2050.
- (Fossil) natural gas demand can remain at current levels up to CO₂ reduction targets of 65% to 70%. For deeper decarbonization beyond 70%, gas has to become 'green', i.e. non-fossil. In the Molecules scenario, demand for green gas reaches ~800 TWh in 2050 in order to achieve a -95% CO₂ reduction.
- Synthetic methane, produced by the power-to-methane process, is the most likely option for greening gas in large quantities. Therefore, and also in the face of further rising significant 'overproduction' of green power otherwise curtailed, it appears crucial to develop this technology on industry scale with respective cost degression rather sooner than later.
- Gas and the existing gas infrastructure will be pivotal for ensuring the security of electricity supply in more than one way: gas acts as a 'permanent synchronizer' for intermittent wind and solar, satisfies peak power demand (rising towards 160 GW in 'EL95') stemming e.g. from heat pumps during cold spells and steps in the breach supplying significant quantities of power (total power demand rising towards ~930 TWh in 'EL95') during protracted periods of 'Kalte Dunkelflaute'.

- While gas-fired power generation capacity will rise from 30 GW in 2015 towards 57 GW ('TM95') and 107 GW ('EL95') towards 2050, peak gas demand will decline in both the Electrons and the Molecules scenario. Hence, existing gas infrastructure by and large suffices, with the caveat that certain adjustments and re-enforcements may be necessary to accommodate the additional gas-fired generation capacity.
- Seasonal gas demand patterns as we presently know them will diminish. However, volatility stemming from renewables intermittency will rise substantially, implying a greater need for short-term flexibility such as 'line-pack' and multiple-cycle peak storages.
- Gas-based decarbonization strategies are significantly less costly than electrification-based ones. The 'Molecules' scenario achieving 80% CO₂ reduction ('TM80') in 2050 causes additional costs of € 1.2 trillion (€ 600 billion cheaper than 'EL80'), while the Electrons scenario achieving 95% CO₂ reduction ('EL95') causes costs of € 2.2 trillion (€ 500 billion more expensive than 'TM95').

The paper "*The underrated long-term relevance of gas in the decarbonizing German energy space*" was jointly written by 'ewi ER&S' and 'The Gas Value Chain Company GmbH'. The English-language paper is available for download at www.ewi.research-scenarios.de and www.gasvaluechain.com.

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About ewi ER&S:

ewi ER&S is a non-profit organization that is dedicated to applied research in energy economics and conducts consulting projects for science, industry, politics and society. With a team of approximately 20 academics, ewi ER&S conducts studies on the basis of cutting-edge economic methods and focuses i.a. on the German and European electricity and gas markets, regulation, market design, decentralized energy supply and reduction of greenhouse gas emissions.

About The Gas Value Chain Company GmbH:

The Gas Value Chain Company ('GVC') offers its services as 'commercial operator' (instead of mere consultancy), e.g. in project management and negotiations. It also serves as commercial expert in arbitrations and mediations. GVC strongly supports gas as a means to effectively battle climate change. Its gas advocacy engagement features multiple publications and presentations (www.gasvaluechain.com/news-events-publications/). Moreover, GVC is affiliated with Brussels-based Eurogas (www.eurogas.org), which it joined in 2016 as its first 'liaising member'.