

Electricity Demand Side Management - The Contribution of a Gas TSO

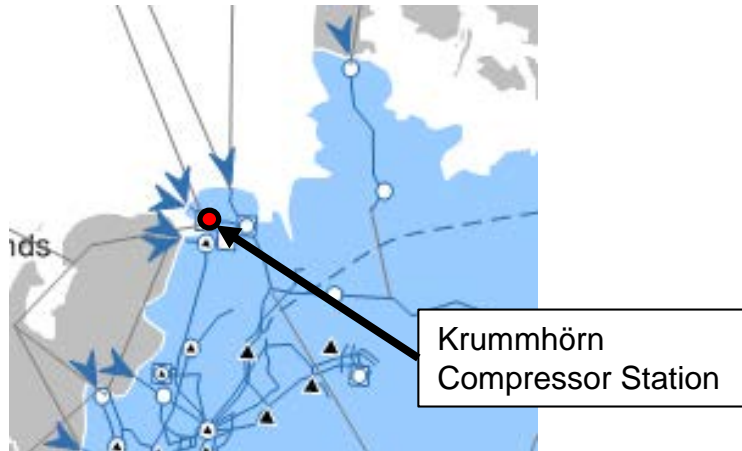
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The Case for DSM

- In 2016, 31 % of all electricity generated in Germany was renewable.
 - In 2006, it was 11 %
- Dispatching electricity has become particularly challenging in regions with a high concentration of wind power, such as the North Sea coast.



Wind power capacity by region as of 2015

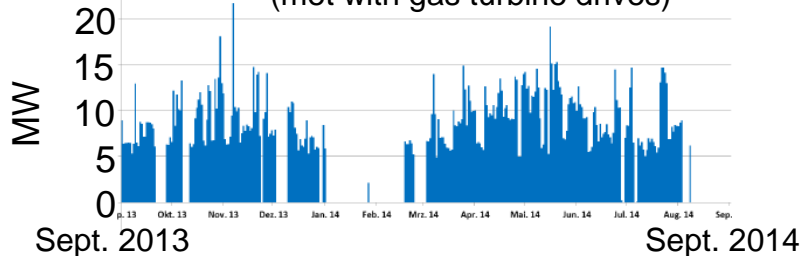


Source: Bundesverband Windenergie

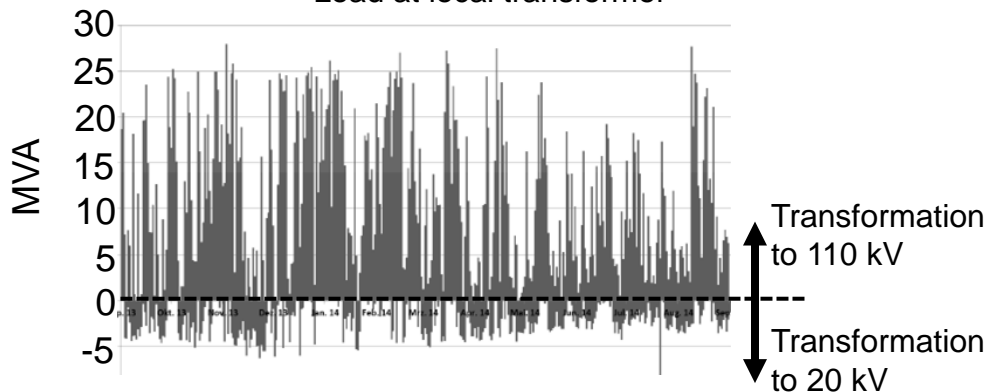
- Open Grid Europe operates gas compressors in this area, which can be driven electrically.

Renewable Electricity calls for local Demand Response

Compressor power demand at Krummhörn
(met with gas turbine drives)

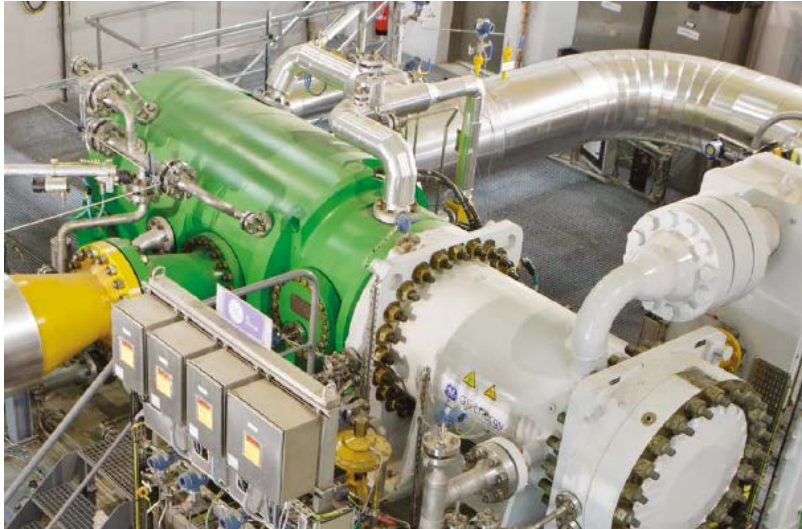


Load at local transformer

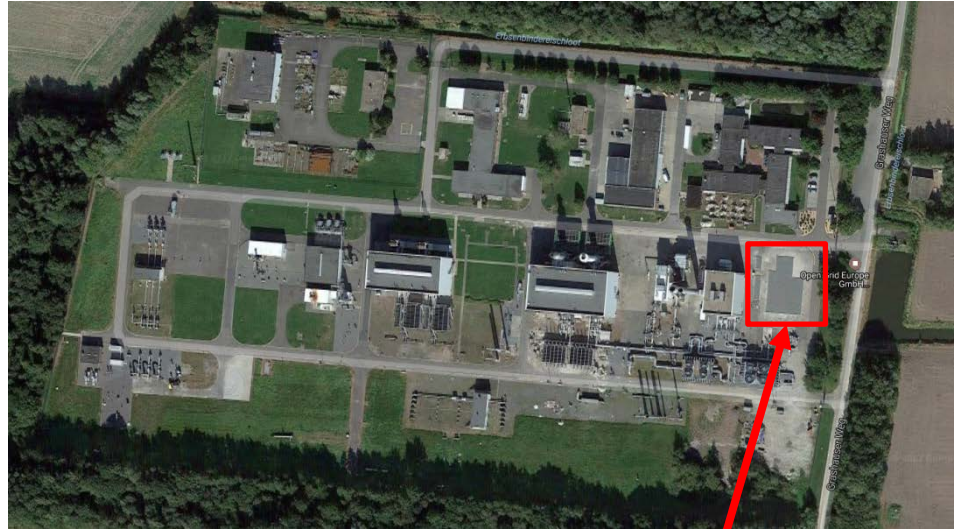


- At Krummhörn, there is significant overlap between compressor power demand and wind energy surpluses.
- OGE will reinvest one GT-driven compressor at Krummhörn with a 15 MW electrical drive, thus coupling the gas and electricity sectors.
- This will enable electricity TSO EWE Netz to avoid investment into additional equipment, i.e. transformers.

Natural Gas Compressor with Electric Drive



Source: GE Oil and Gas



Source: Google

New compressor to be built in 2018

Conclusion and Acknowledgements

- Benefits of electrically driven gas compressors:
 - Economic: avoids investment into electricity infrastructure by cutting peaks of renewable energy production
 - Business: helps OGE cut CapEx and OpEx (maintenance, but potentially also energy supply)
 - Environmental: cuts CO₂ emissions since fossil natural gas is substituted by renewables
- Role of gas compressor plants in blackout scenarios to be clarified on a case-by-case basis
- Operational implementation to be clarified, but adverse effects on gas transport can be avoided.
 - Operational control of the compressor to remain with OGE
 - Bilateral agreement between OGE and EWE Netz pending
- Open Grid Europe would like to thank EWE Netz for their ideas, support and cooperation.
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