26ᵗʰ World Gas Conference

1 – 5 June 2015, Paris, France

WOC 4 Distribution Thematic session:

Towards smart distribution gas grids: why and how?

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Towards smart distribution gas grids: why and how?

Thematic session WOC 4.3 program

Pascal Vercamer - CHAIRMAN	Welcome and introduction Technical Committee Study WOC4.3 Report
Dominique Damman	SMART MONITORING OF GAS DISTRIBUTION GRIDS
Kimberley Denbow	SMART ENERGY FUTURE – CYBERSECURITY & RESILIENCE
Bezhad Babazadeh	INTEGRATING CONTROL AND MONITORING SYSTEMS IN Smart GAS GRIDS AND THE SECURITY||ISSUES
Gaetan Cherix	TOWARDS PRE-DIMENSIONING OF NATURAL GAS NETWORKS ON A WEB PLATFORM
Roch Dozdowski ; Catherine Thauvin	SMART GAS INFRASTRUCTURES PROGRAM IN FRANCE
WISEMBLY Q&A session - INCOMING QUESTIONS FROM THE AUDIENCE	

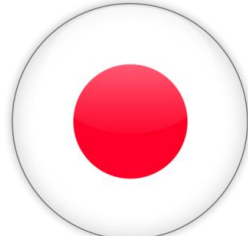# 26ᵗʰ World Gas Conference

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WOC 4 Distribution Sub group 4.3 Report

Smart Grids in Gas distribution

Pascal VERCAMER
WOC 4.3 chairman

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A triennium of technical and operational exchanges resulting in a state-of-the-art and analysis included in WOC 4 triennium report

Why focusing on smart gas grids?

- An emerging subject : the world is changing, the technology is changing, the gas distribution network must change

- Higher requirements for safety and reliability of networks

- Opportunities given by new technologies

- Accomodation of new gases (green gases) by using existing network

- Possibility of new solutions for decreasing DNO costs: optimisation of maintenance, reliability and flexibility of the network

- A possible new position of gas versus electricity: a way of integration of gas in energy systems, possibility for developing new gas uses thanks to a more flexible distribution network

Smart gas grids as a part of an interactive energy system

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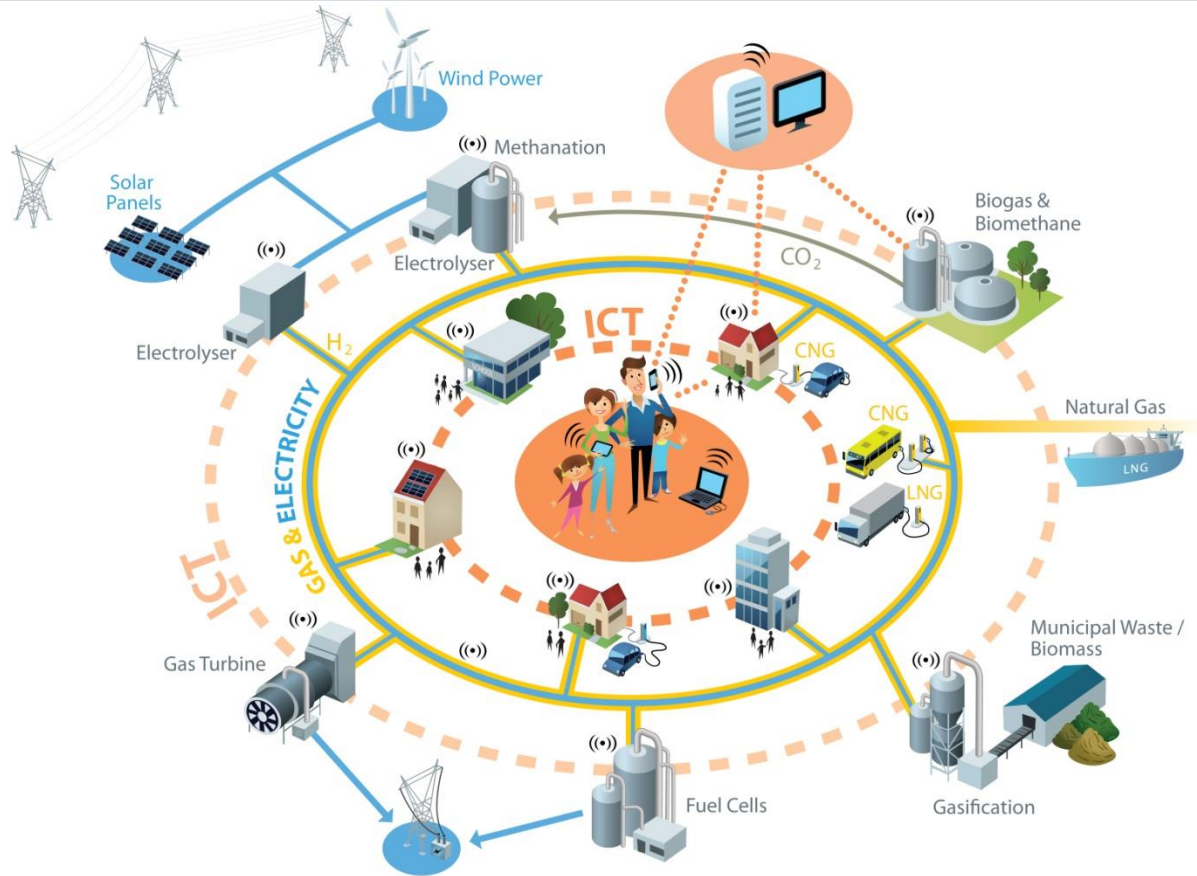
One major difference between asmart gas grid and a smart electricity grid:

Gas grid offers a capability of energy storage so that it does not need real time monitoring

A wide range of functionalities

| Gas grid operation optimisation	Gas quality monitoring	Connection with electricity and other energy systems
• Pressure monitoring • Smart regulating station • Maintenance monitoring, traceability and localization • Cathodic protection monitoring • Incidents monitoring • Remote measurements data management • Earthquake risk prevention	•Remote operation of network including biomethane or new gases (H2, Syngas,…) injection management • Odorization control • Gas composition and GCV monitoring	• possibility of remote and automatic monitoring of CNG(Compressed Natural Gas) stations, peak shaving storage, local storage… • arbitration in the use of Gas Heat Pumps, hybrid heat pumps, micro CHP and fuel cells in connection with electricity and gas networks
Drivers: safety, operating costs, network reliability	**Drivers**: safety, network reliability, successful management for injecting new gases	**Drivers**: optimizing energy supply – shaving electricity peaks

Inline inspection systems to get extensive information and data on distribution lines

Hybrid energy systems
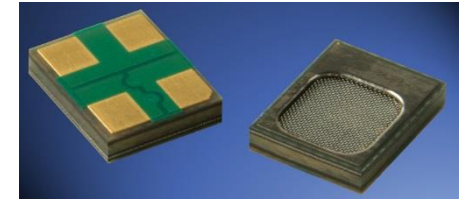
Automatic remote metering systems MEMS (micro and nano sensors): cheap and communicating measuring device

Commercial grid power

Electric power From Ene-farm

City gas

Hot water
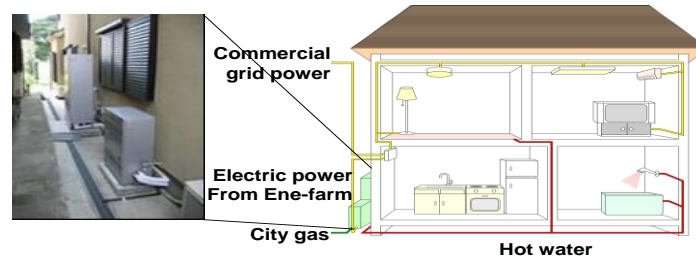
Questions raised when designing a smart gas grid systems

- What interactions are there between electricity, gas, heat and cooling in a given system?

- In terms of planning future investments, are new networks or renovation of existing networks envisaged?

- What smart / combined energy utilization will there be (e.g. cogeneration and micro-CHP)?

- What monitoring of system operations in real time and optimization of pressures/flows will there be?

- What is the data exchange between different market players? Data volume? Which ICT network? Dedicated or common communication grid?

- Is there a need for bidirectional energy networks?

What are the critical success factors for a smart gas grid?

- A thorough analysis of the desired additional functionalities resulting in a clear roadmap of suitable technologies in terms of **performance and economics**

- **Assessment of gas grids projects must consider direct and indirect benefits to all stakeholders**: customers (energy costs , new services to customers based on data analysis, …), gas producers (possibility of new energy sources), DNO (easier et more interactive operations) and society (safety, environment, decentralized energy system)

- Future smart gas grids must **anticipate** technological changes in ICTs and in data management (open data, big data concept)

Conclusion

The way from a current gas grid to a smart gas grid is not unique and depends on each DNO needs

→Do not look for a smart gas grid build your own!

THANK YOU FOR YOUR ATTENTION