



**GERG**

GROUPE EUROPEEN DE RECHERCHES GAZIERES  
THE EUROPEAN GAS RESEARCH GROUP



# Hydrogen Blending and Network adaptation

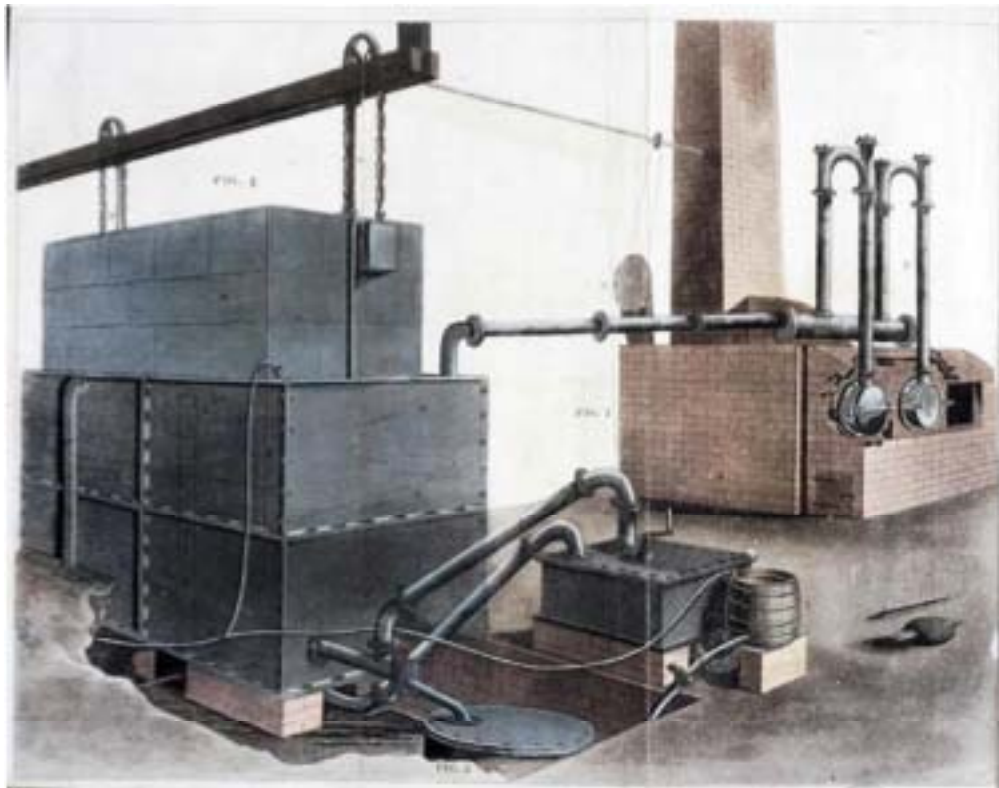
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GERG – The European Gas Research Group

IEA Hydrogen Roadmap workshop June 10th 2013 Paris

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# Hydrogen, fuel of the future?



Towns gas produced from coal, 1815

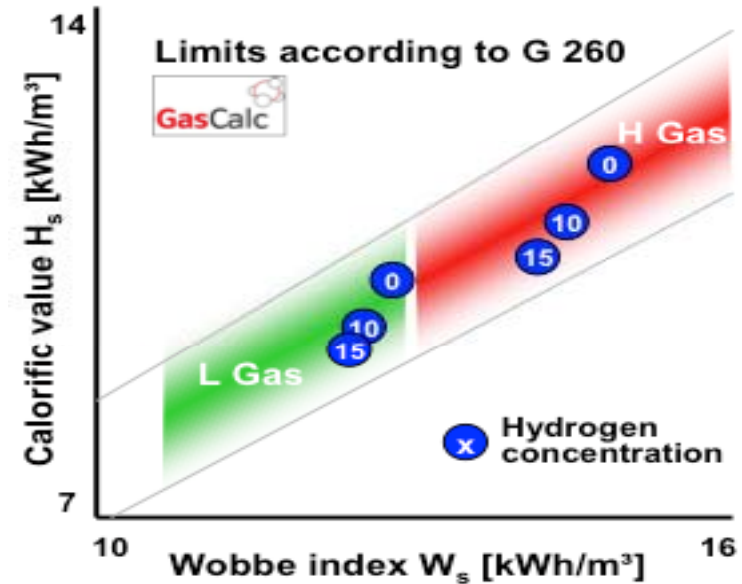
- Our gas infrastructure was designed to transport and use hydrogen blends and did so for over 150 years
- Hydrogen content up to 63%
- Since the introduction of natural gas, the network and applications have been developed for an assumed hydrogen concentration close to 0%.
- Towns gas is still produced for domestic use in cities such as Hong Kong and Singapore, using natural gas as a source

# Challenges and Bottlenecks for hydrogen injection

- Is all storage hydrogen ready?
  - Modern gas turbines with pre-mixed burners
  - Steel tanks in NGVs
  - The existing appliance population. Engines?
  - Electrolyser scale and costs
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- What are the limits?
  - What needs to be done?
  - What technology advances need to be supported?
  - What are the economics for the competing routes?
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- ....Regulatory and Europe wide standards

# GERG Hydrogen in Pipelines (HIPS)

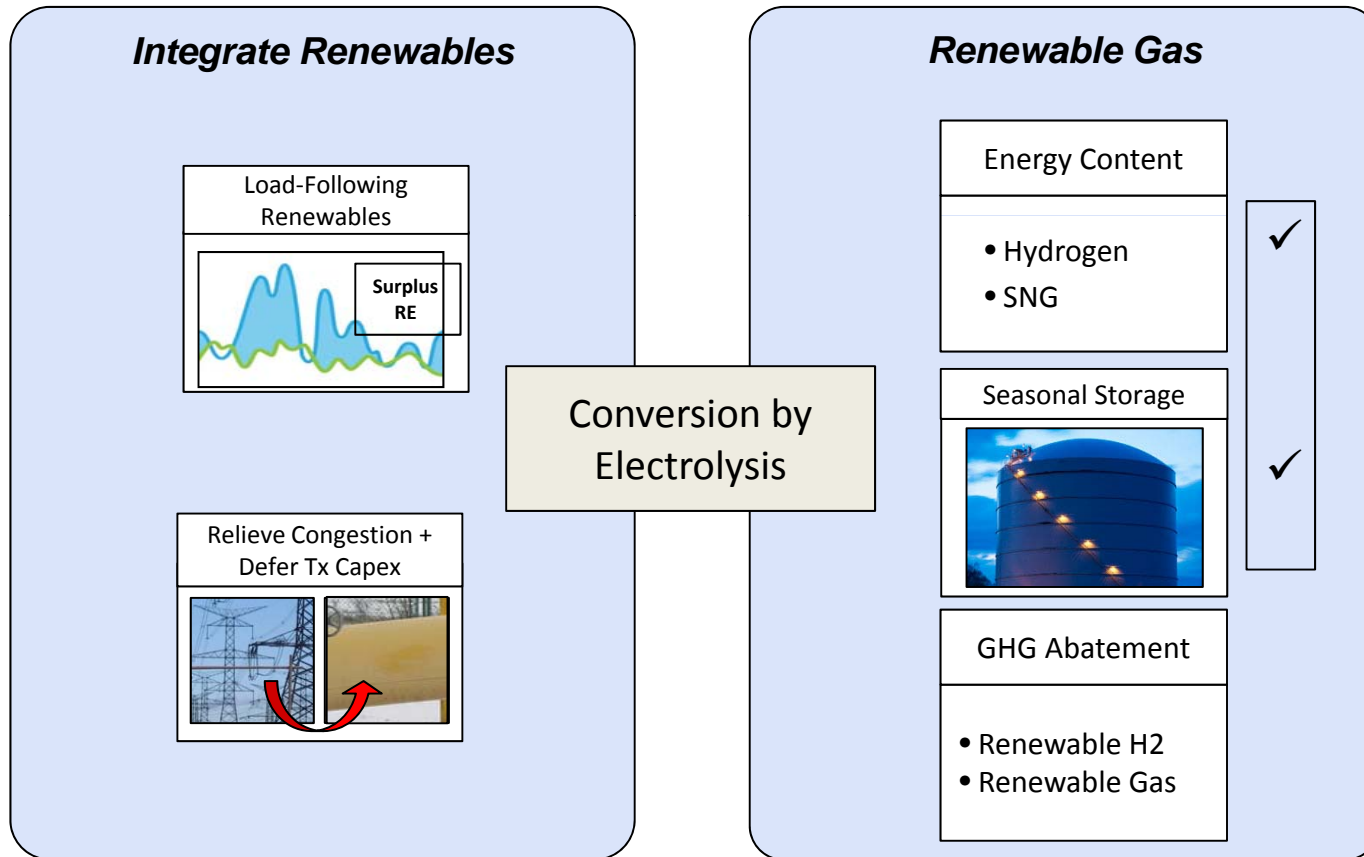
- Formal H<sub>2</sub> constraints from manufactures (e.g. CNG tanks, gas turbines, engines)
  - 2% limit on old CNG tanks,
  - 1-5% for turbines – rate of change is an issue, flashback potential, dynamics
- Further understanding of appliances under extreme conditions – what do we know
- Gas Storage
- Project is providing a gap analysis of current constraints on introduction of hydrogen into natural gas pipelines
- Follows EU FP6 NATURALHY project (Gasunie, GERG)



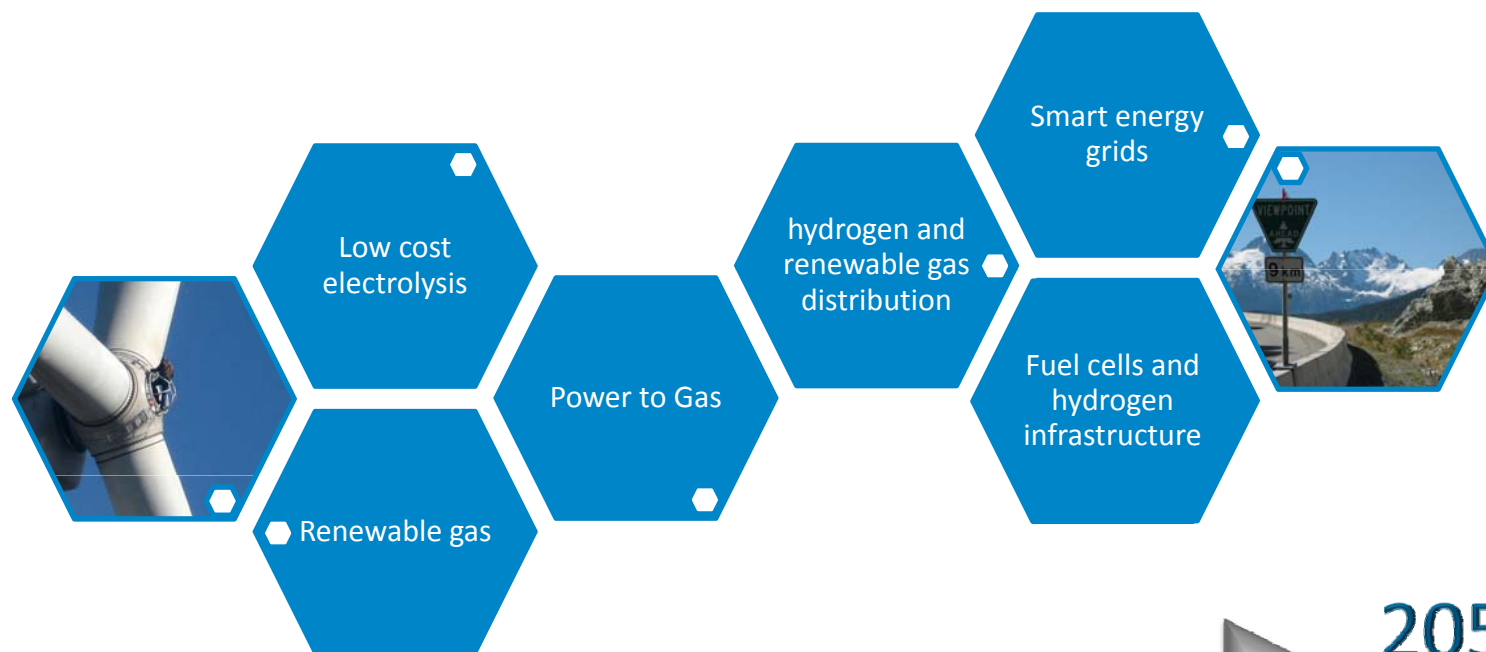
- A hydrogen methane mixture (up to 15% H<sub>2</sub>) meets all significant quality requirements for natural gas (technical code DVGW)
- In UK 0.1% H<sub>2</sub> is outside allowed GSMR limit
- Interchangeability is more than just Wobbe Index
- Harmonisation of gas quality

# Regulatory Considerations

Only elements of the Power-to-Gas value proposition that could be monetized today are the energy content of the gas produced and seasonal storage (Source: Hydrogenics)



# The Road?



2010

Increasing renewables integration

2050

Thank you for listening!



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