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Decarbonization and security of supply in the gas industry: Innovation is key

By

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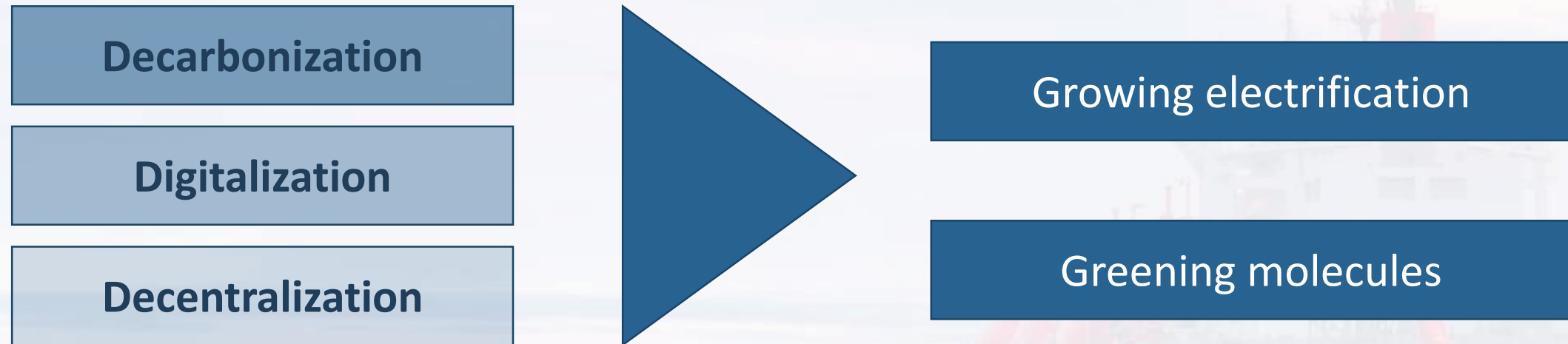
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Decarbonization and security of supply in the gas industry

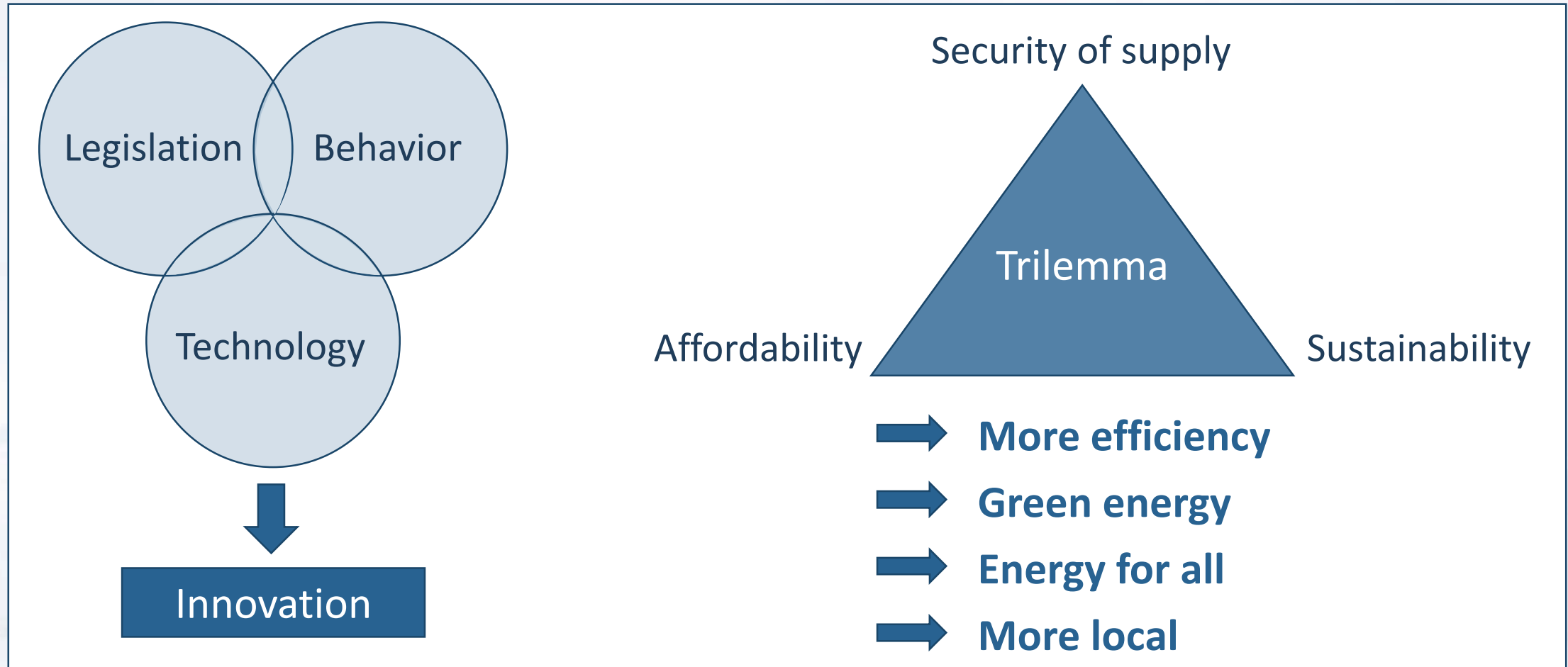
Innovation is key. Global Gas Centre, Geneva

Trends in the energy sector

Impact of the transition on the energy systems

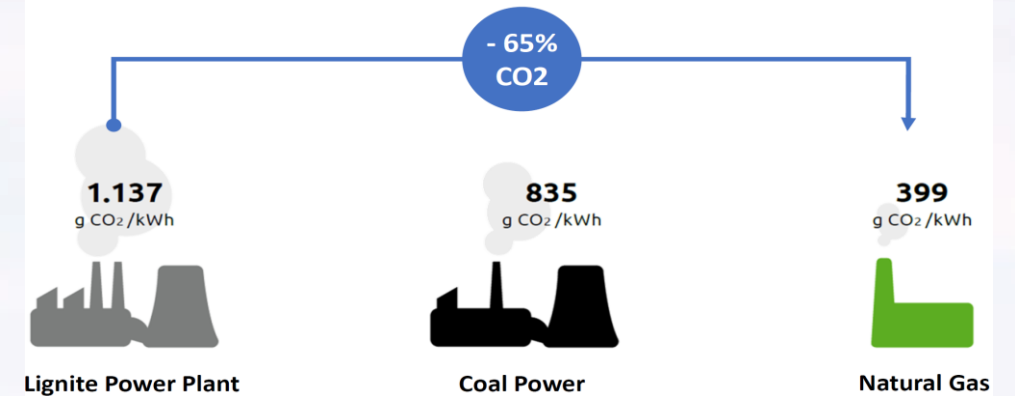


Actions needed for the transition

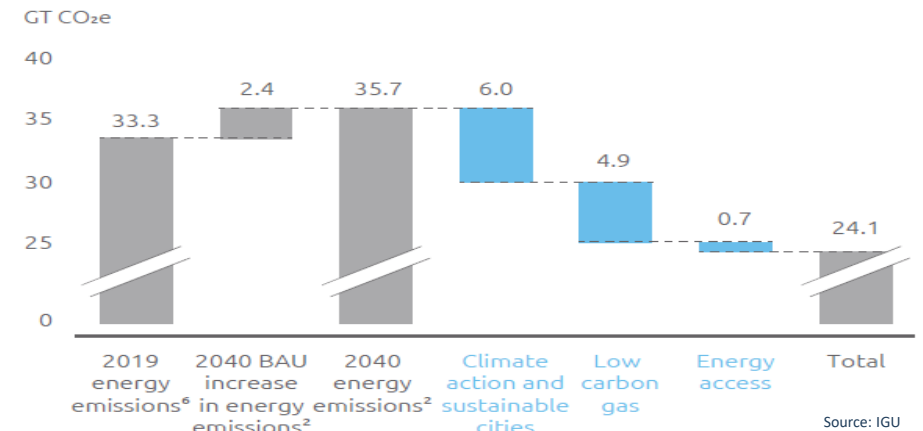


Main gas decarbonization strategies

- **Fuel switching.** Gas-fired power plants can provide the flexible backup capacity needed in a system with high share of intermittent renewable energy sources.
- **Carbon capture.** Carbon capture, use and storage (CCUS) projects are developed (e.g.: Northern Light project in the North Sea).
- **Energy efficiency.** Renewing building envelopes and using hybrid gas boilers not only improves energy efficiency and save GHG emissions but also produces electricity in winter.
- **Green gases.** Developing the production of biogas/biomethane, synthetic methane and hydrogen contributes to reducing the carbon-footprint of the gas infrastructure.
- **Mobility.** Natural gas and green gases could however play an important role for light-duty vehicles (LDV) and long-haul trucking (HDV), as well as in the maritime sector.

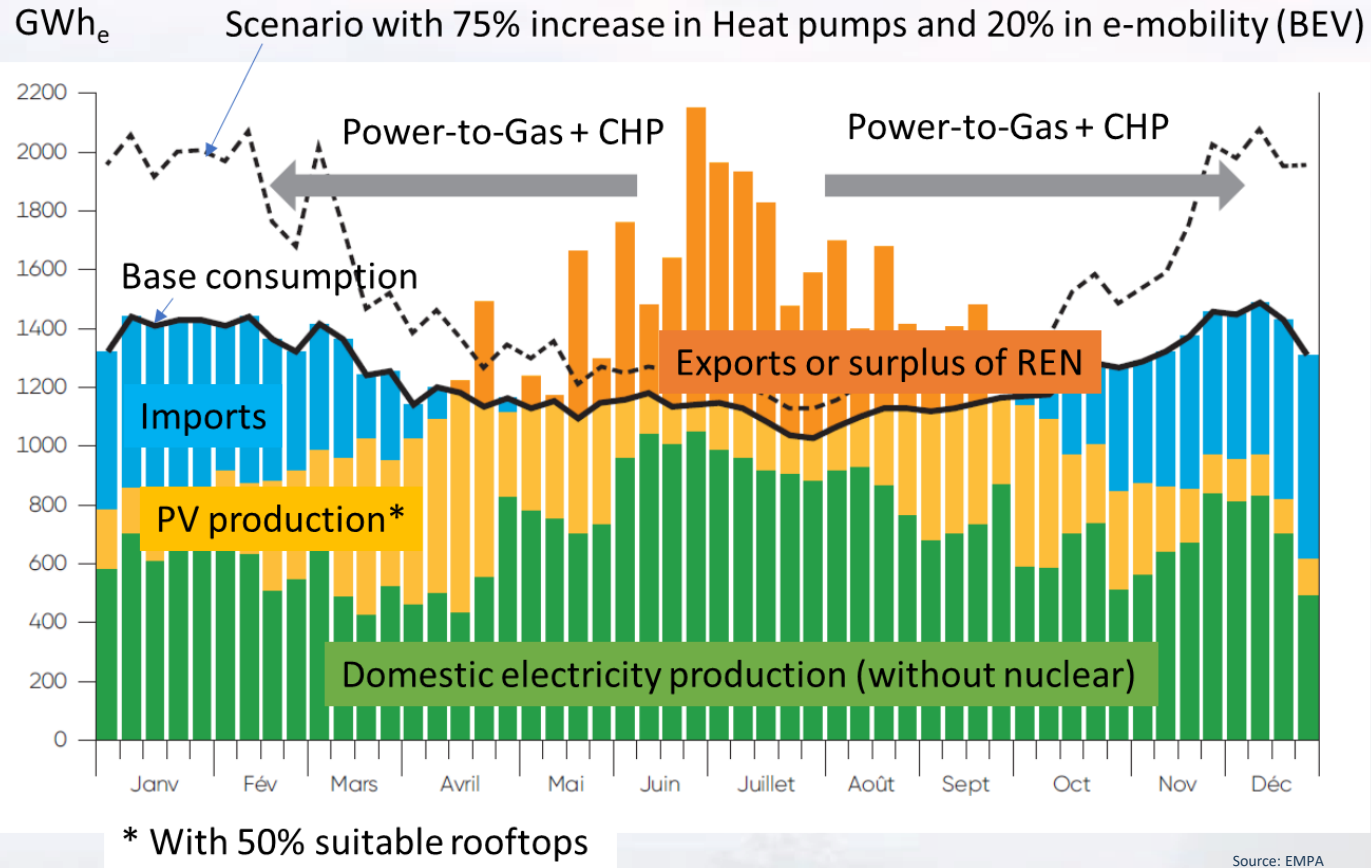


Global GHG emissions maximum reduction potential³ from gas technologies by 2040



Sector coupling

Swiss electricity demand and production ES2050



Key technologies for the future

Technology	Existing / in development	Disruptive technologies	Costs \$ / MMBtu
Renewable gas (biomethane)	<ul style="list-style-type: none"> Anaerobic digestion Efficiency improvements 	<ul style="list-style-type: none"> Pyrolysis Methanation (H₂ + CO₂ -> CH₄) 	10 – 45
Hydrogen	<ul style="list-style-type: none"> SMR SMR + CCUS Electrolysis 	<ul style="list-style-type: none"> New electrolyzers Power-to-Gas systems 	SMR 7 – 22 Electrolysis 17 – 41
CCUS	<ul style="list-style-type: none"> Amine based pre and post combustion capture Pilot carbon storage units 	<ul style="list-style-type: none"> Membrane technology /e.g. graphene / polymer) Large scale carbon transport and storage units Oxyfuel combustion 	CH ₄ + CCUS 11 – 47

Biogas for domestic cooking



Thank you for attention!

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