

Looking for a rational solution  
for all along the cross-border gas supply chain

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## Decarbonization

## Indigenous Production Scenarios

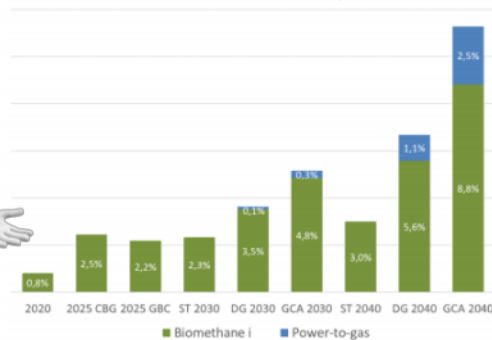


➤ Declining trend expected even in the best case scenario

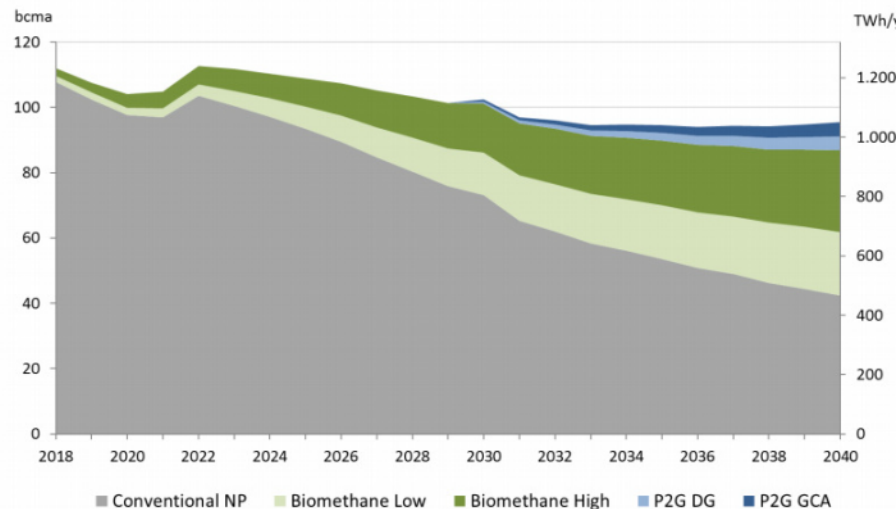
## Green Gases



% Green Gases over total demand  
from Draft Scenario Report



\* Scenario Report (to be updated)



## Decarbonization

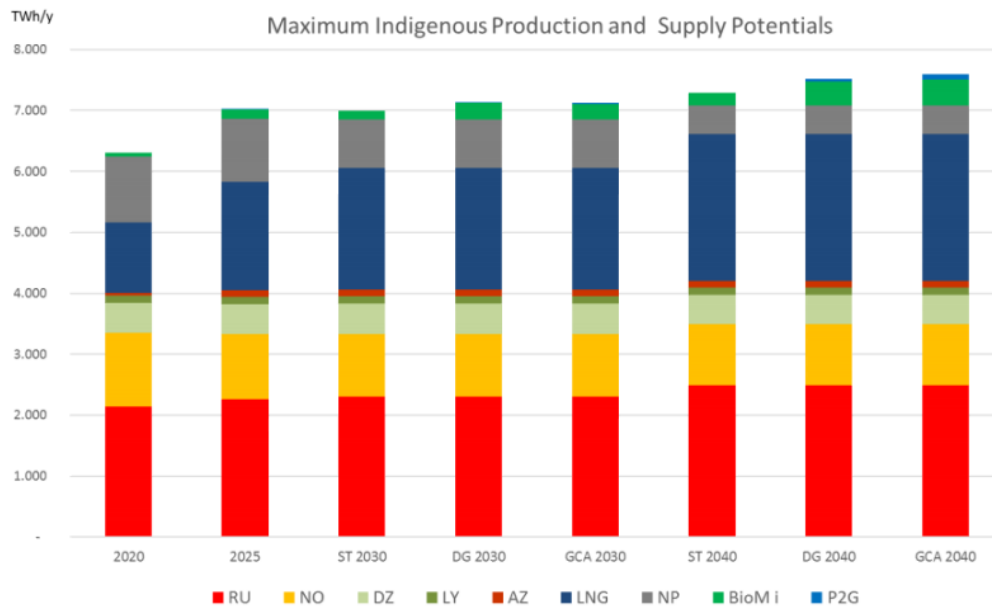


## Green Gases

According to the Draft Scenario Report  
ENTSOG TYNDP 2018 the share of  
Green Gases over total demand will  
**not exceed 12% in 2040.**



## Indigenous Production and Supply Potentials



# Decarbonization

Recycle

Environment

Sustainable development

Climate change

Greenhouse gas

Industry

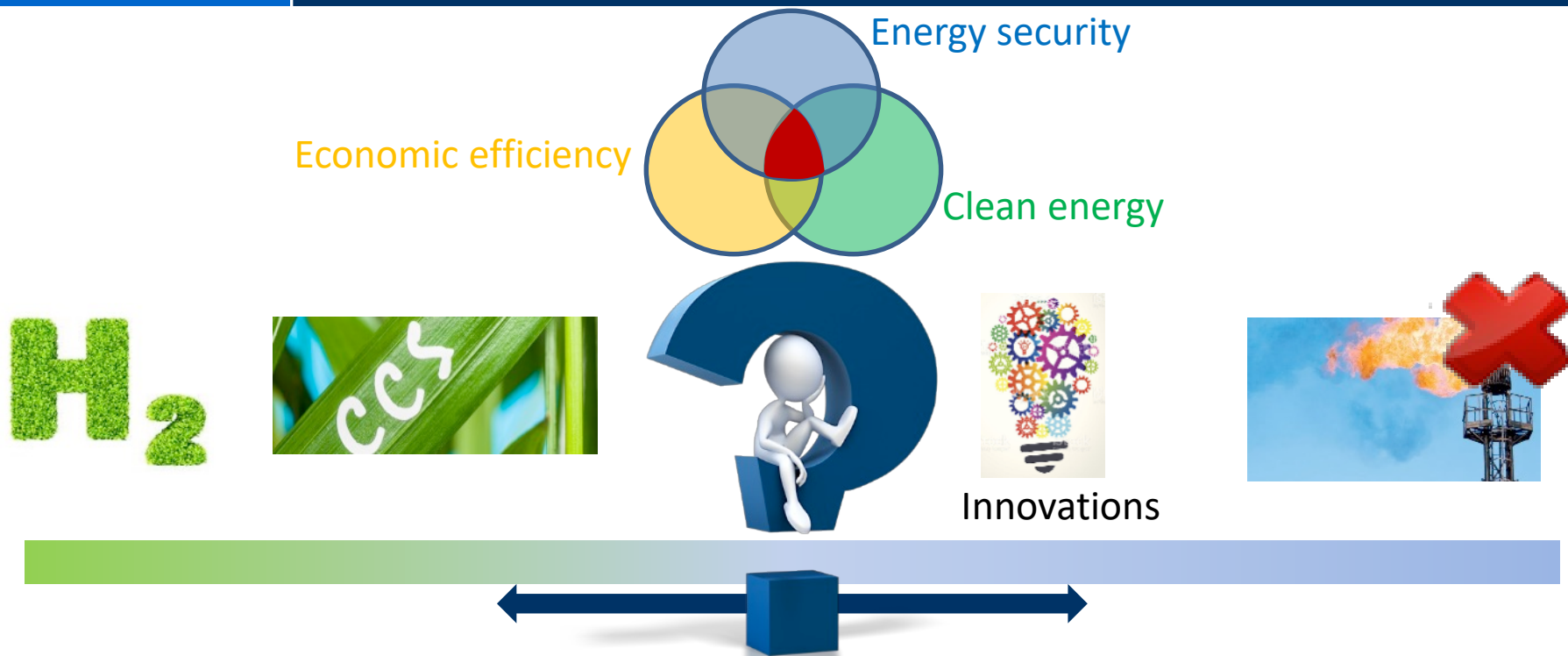
Energy saving

Environment

A horizontal row of various green icons representing sustainability and environmental themes. The icons include light bulbs, recycling symbols, wind turbines, houses, trees, and other eco-friendly symbols, all rendered in different shades of green.

# Decarbonization Pathways

	Shell	Equinor	Total	BP
<b>Operational efficiency</b>	SmartFields, CCS, Flying Nodes, Shell MMLS Liquefaction technology	Sub-sea compression station, WS Seabed Rig, TAIL, Drill Plan, Cloud Data Storage, CCS	Pazlflor, CCS, Subsea-to-shore technology	WATS, Plant Operations Advisor Intelligent system
<b>Development of RES</b>	Airborne Wind energy (AWE) - Kite Power Systems, Bioethanol production	20% of CAPEX in RES by 2030, Hywind, Photovoltaic technology solutions, Biofuel technology	25% of investments in RES by 2022	Hydrogen plant, Solar's Mono2 silicon, Biofuel production
<b>Ventures</b>	Shell Technology Ventures, Engineering companies	Equinor Energy Ventures	Total Energy Ventures	BP Ventures

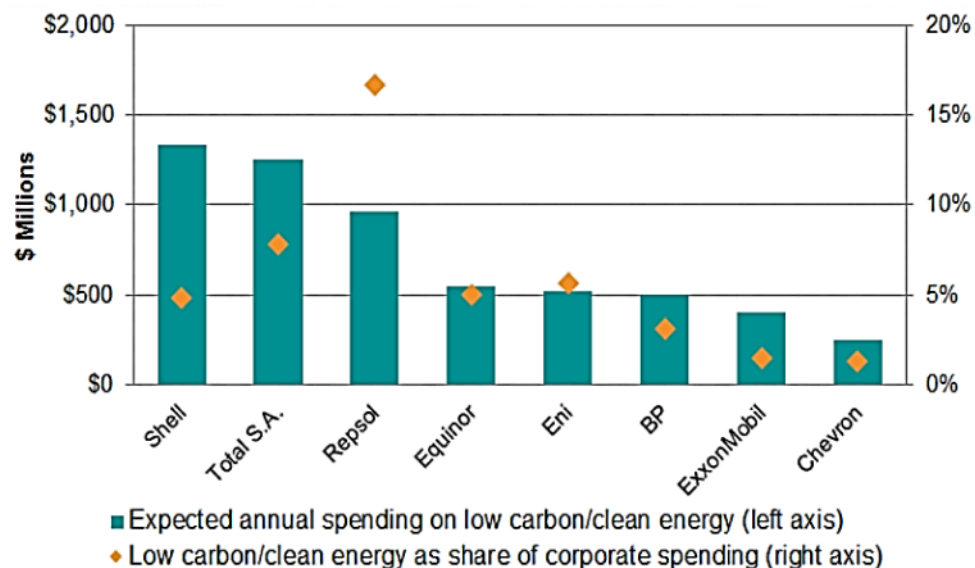


## Low-Carbon Sector: the Majors activity

For the European-based companies the expected amount of investments in the low-carbon sector is 3–5% of corporate Capex in the near term.

While European companies are expanding their participation in the new energy technology segment through more diversified portfolios, a more conservative approach based on operational efficiency improvement will dominate in the corporate strategies.

Global Integrated: Annual low-carbon spending outlook (2018–2020)



Notes: Based on company statements and IHS Markit estimates. Low-carbon sector includes alternative energies (inc renewables and biofuels), storage, alternative transportation, gas in transmission and distribution, and emissions reduction from operations. Includes capex and R&D spending.  
Source: IHS Markit

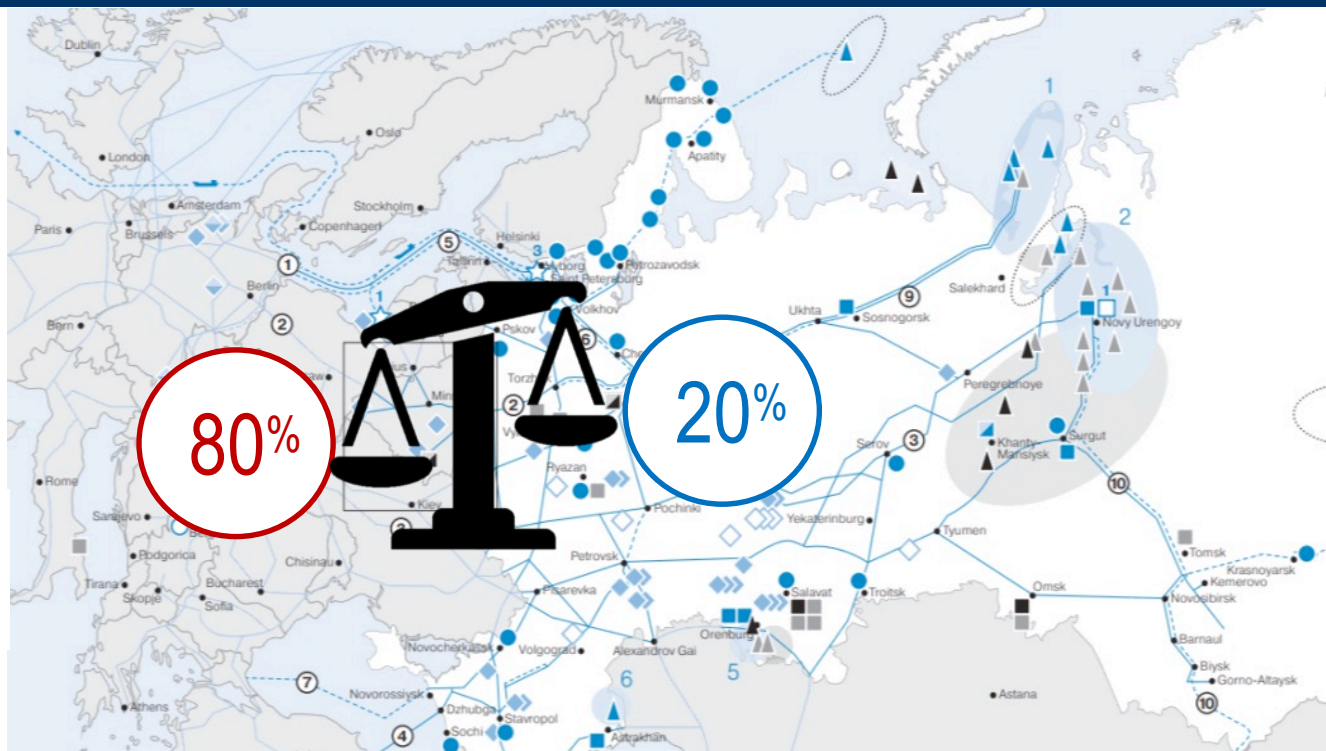
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# GHG Emissions Ratio alongside the Natural Gas Supply Chain

The core GHG emissions alongside the gas supply chain attributed to the combustion/ final consumers stage



Industrial Power Consumers







Only by joint efforts we can find a rational solution that satisfies all the stakeholders



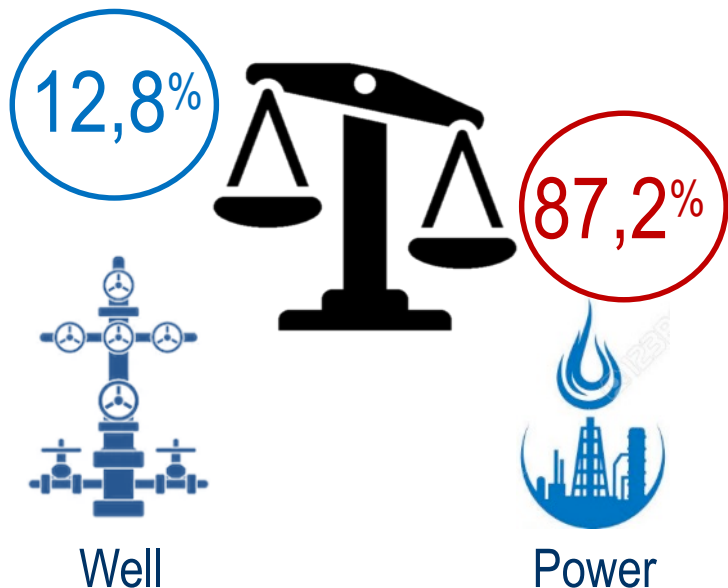


# Thank You for Attention

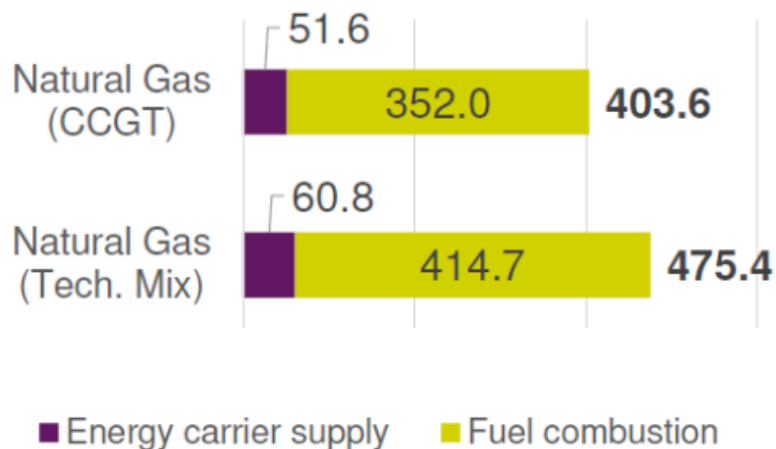
# Unsubsidized Levelized Cost of Energy Comparison



# Well-to-Electricity – GHG Emissions: Electricity Production Comparison for different Energy Carriers



Well-to-Grid - Electricity, at power plant - GHG (EU-28)  
[g CO<sub>2</sub>-eq/kWh]



Source: Greenhouse Gas Intensity of Natural Gas Report, Thinkstep AG, 2017