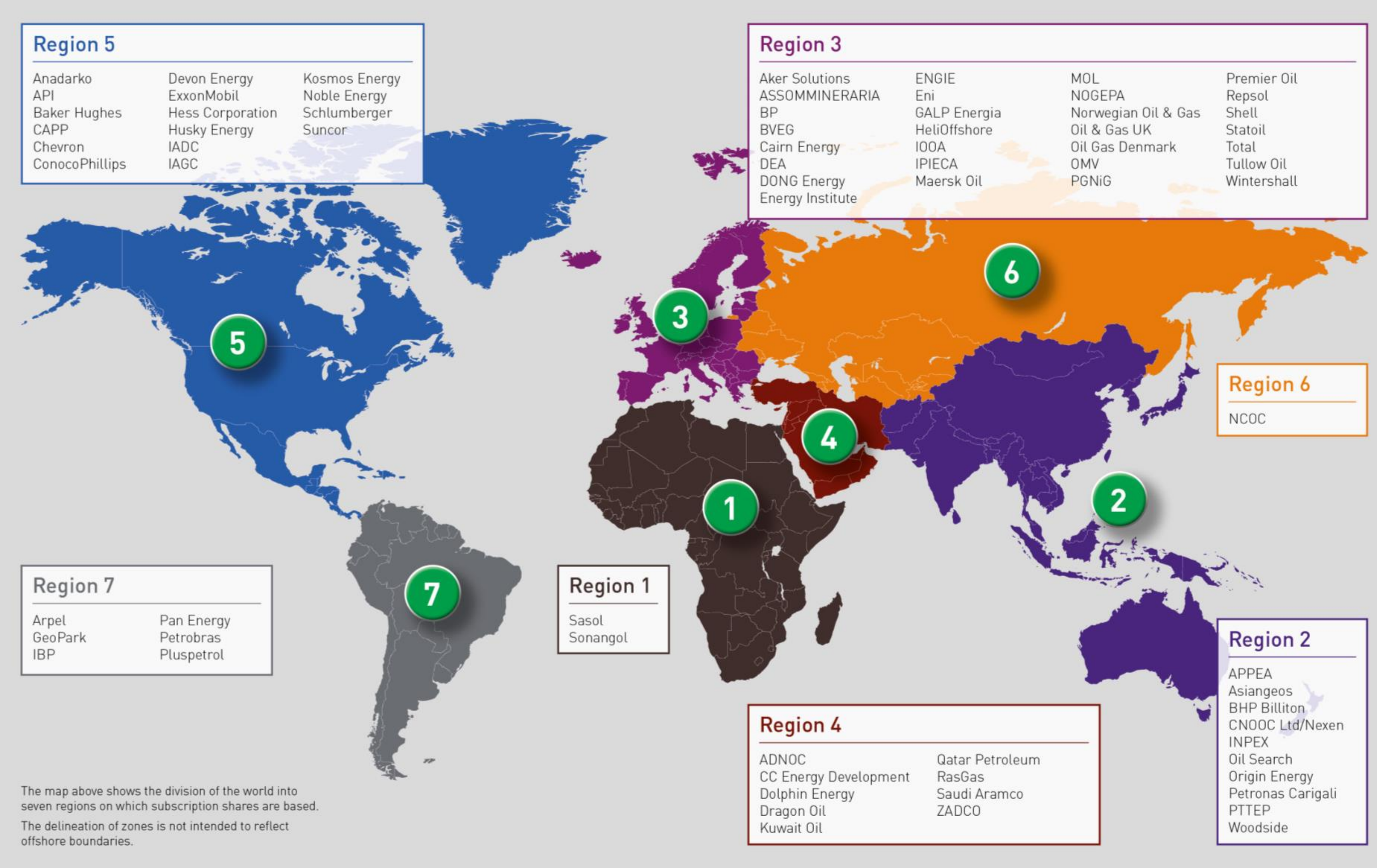
International Association of Oil & Gas Producers

ENTSOG workshop
Christian Schwarck
‘EU domestic gas production’

73 Members around the world



Map shows locations of Member Head Offices. Many operate globally

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Why domestic production for EU?

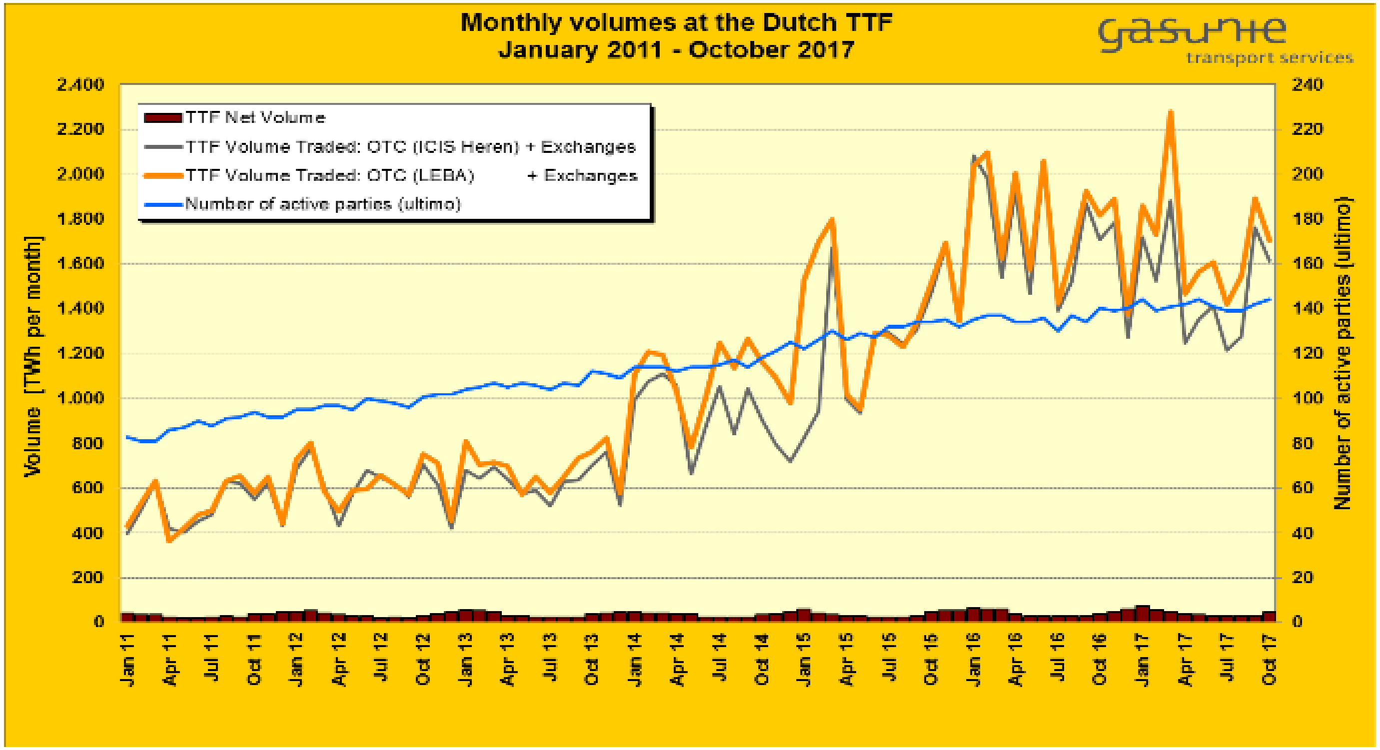
- Promotes development of liquid hubs
  - TTF, NBP
- Competition is enhanced
- Leads to roll out of gas infrastructure
- Develops gas chain skills which ultimately benefits the market
- Public benefits, jobs, and energy R&D

Source: Woodmap for IOGP: Upstream Competitiveness

Gas Hubs

- Resilient basis to support gas market development
  - Avoid dependency on infrastructure
  - Ability to compensate for disruptions

TTF Liquidity Development
Source: GTS



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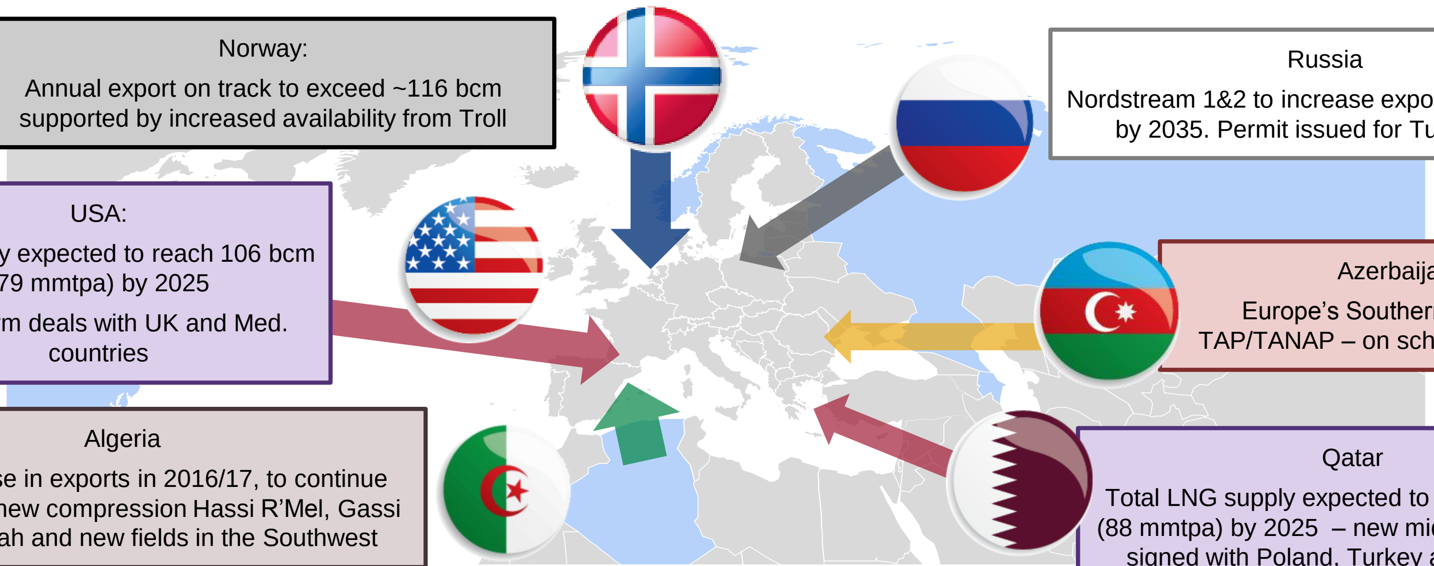
EUROPEAN UPSTREAM CONTEXT

At present the EU28 + Norway accounts for 50% of EU28+Norway's total gas supply requirements, a decline from 57% in 2015

Key Gas Suppliers to EU28+Norway



Norway:
Annual export on track to exceed ~116 bcm supported by increased availability from Troll

Russia
Nordstream 1&2 to increase exports by 90 bcm by 2035. Permit issued for Turkstream

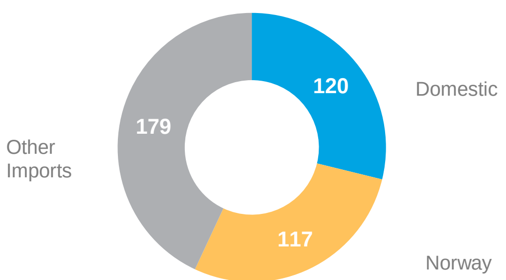
USA:
LNG supply expected to reach 106 bcm (79 mmtpa) by 2025
Long-term deals with UK and Med. countries

Azerbaijan
Europe's Southern Corridor, TAP/TANAP – on schedule for 2019

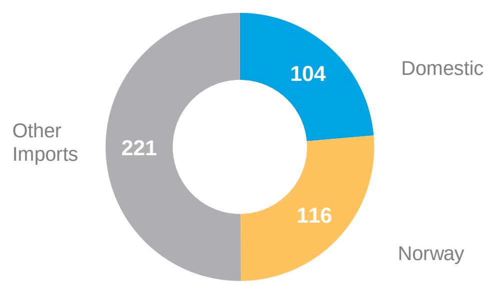
Algeria
Significant rise in exports in 2016/17, to continue supported by new compression Hassi R'Mel, Gassi Touil, In Salah and new fields in the Southwest

Qatar
Total LNG supply expected to reach 119 bcm (88 mmtpa) by 2025 – new mid term contracts signed with Poland, Turkey and Germany

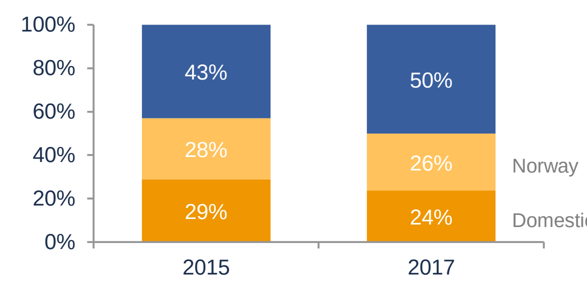
2015 EU28+Norway Gas Supply Mix | bcm



2017 EU28+Norway Gas Supply Mix | bcm



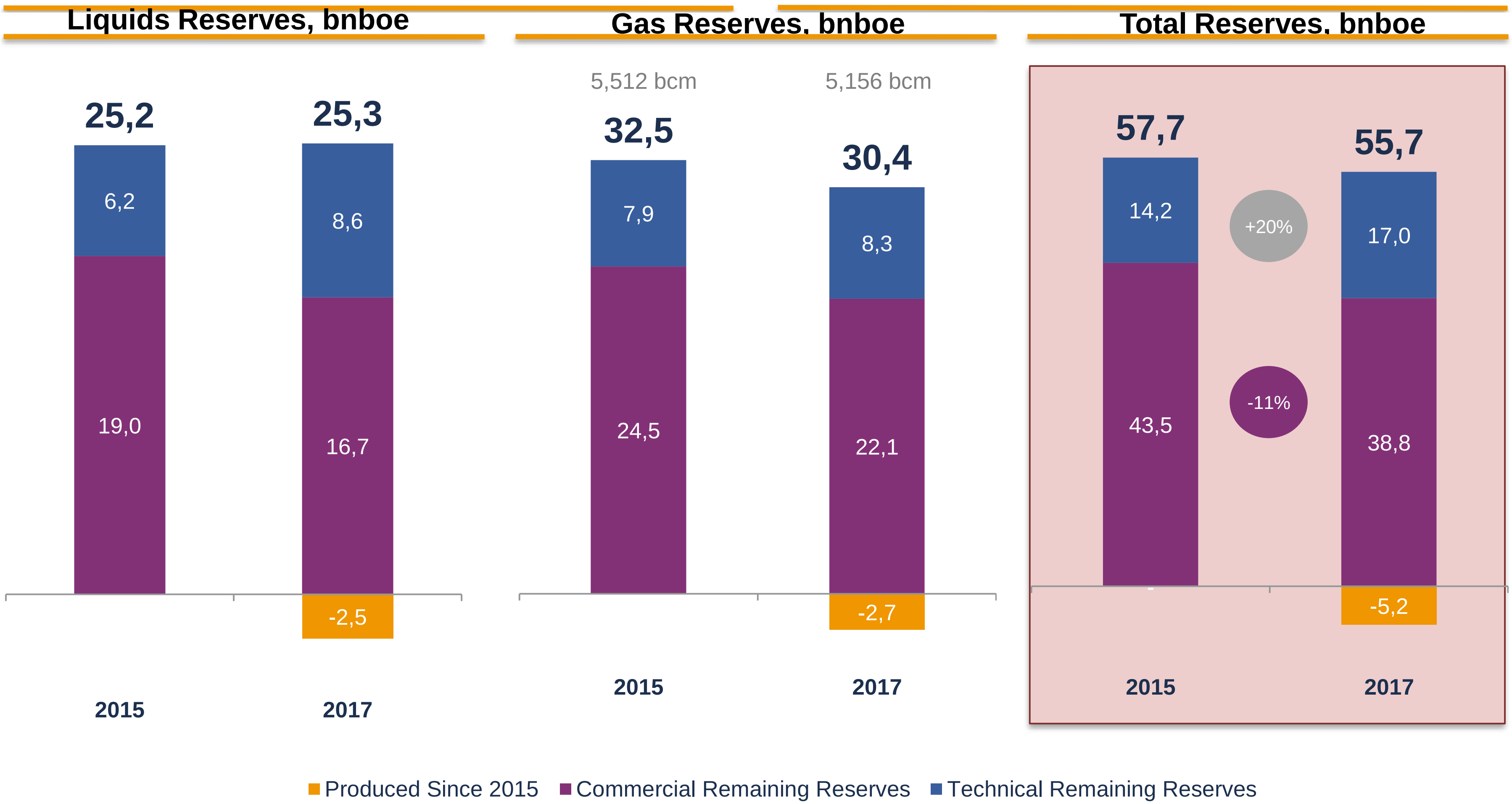
EU28+Norway Gas Supply Mix | Comparison



Demand includes volumes re-exported by Europe
Other imports include: Russia, Algeria, Azerbaijan, Libya, Iran, LNG

EUROPEAN UPSTREAM CONTEXT

Despite a decrease in total commercial reserves since 2015 , Europe holds 17 bnboe of future upside from existing but undeveloped fields

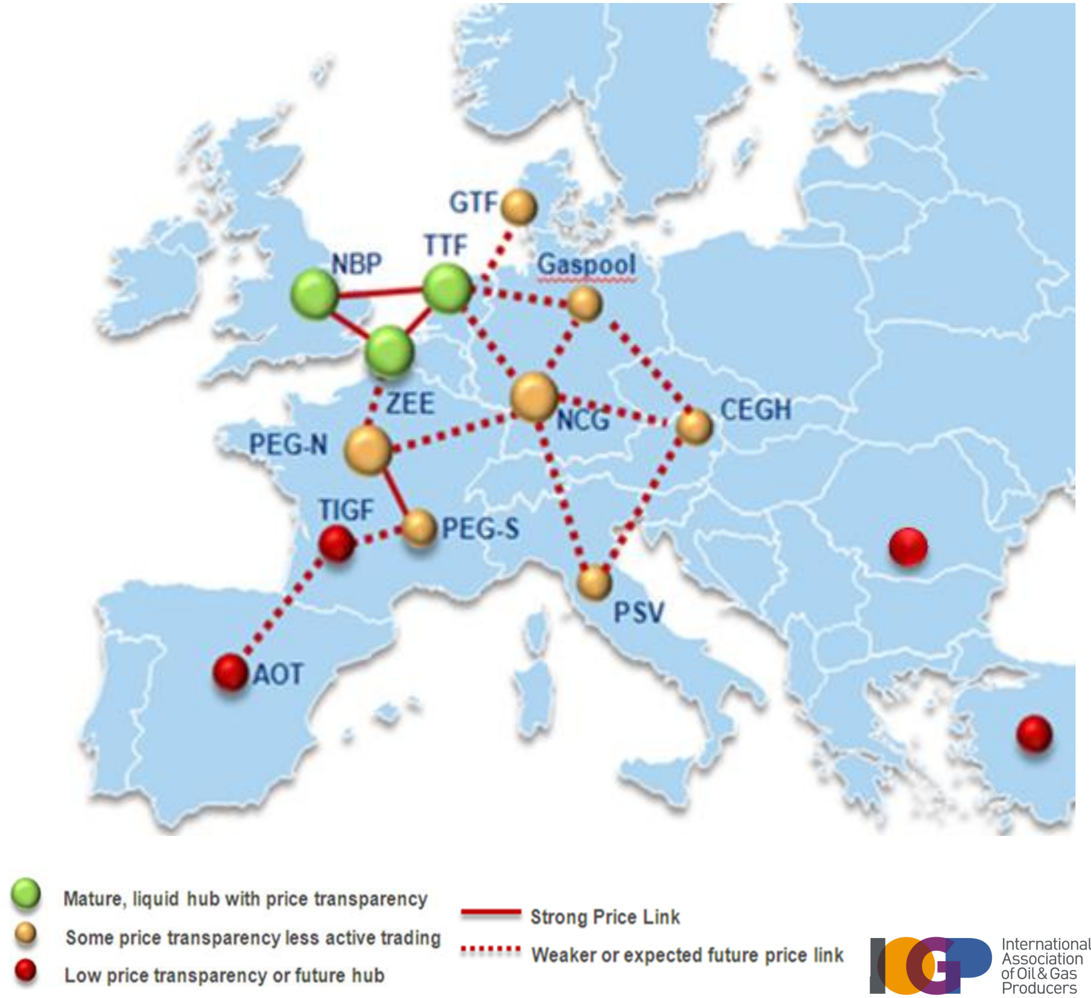


Source: Woodmap for IOGP:
Upstream Competitiveness

Policy focus on hubs and rules

- Hub access can lead to quicker ‘gas to market’
- Cross border access to liquid hubs can avoid inefficient infrastructure
- Import infrastructure in each Member State impacts drivers to integrate cross-border
- Subsidised infrastructure (storage, LNG) distorts the market
- Subsidies also tilt the field against other sources of gas flexibility, leading to suboptimal supply patterns
- Level playing field the best approach, as it keeps system costs down

Source: Woodmap for IOGP: Upstream Competitiveness



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Policy factors impacting the market

- Regulated retail prices remain a problem
- Market obligations restrict commercial flexibility
- Questions about the future role of gas
- How can we make the gas system fit for the future?

Steam methane reforming

- Hydrogen with CCS could ensure long-term key role for existing gas infrastructure
- Long-term perspective on infrastructure is necessary
- Leeds project uses CCS

Source: https://www.statoil.com/en/news/evaluating-conversion-natural-gas-hydrogen.html

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Conclusions

- Indigenous EU resources should be economically recovered, as they contribute to diversification and market competition
  - Promote hub development and liquidity
- A balanced EU portfolio will attract pipeline gas, LNG, domestic production and storage investment
  - Obligations can distort market efficiency
  - Don't 'pick winners', e.g. LNG hub or storage support
- Gas producers are part of the energy transition solution
  - Coal remains priority climate challenge
  - Gas plus renewables
  - New forms of gas ensure continued relevance of EU's extensive networks
  - Decarbonised gas
  - Policy framework should be assessed in light of future challenges

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