

26th World Gas Conference

1 – 5 June 2015, Paris, France



SP 3: 2050 Prospective Study

Prospects for Natural Gas up to 2050

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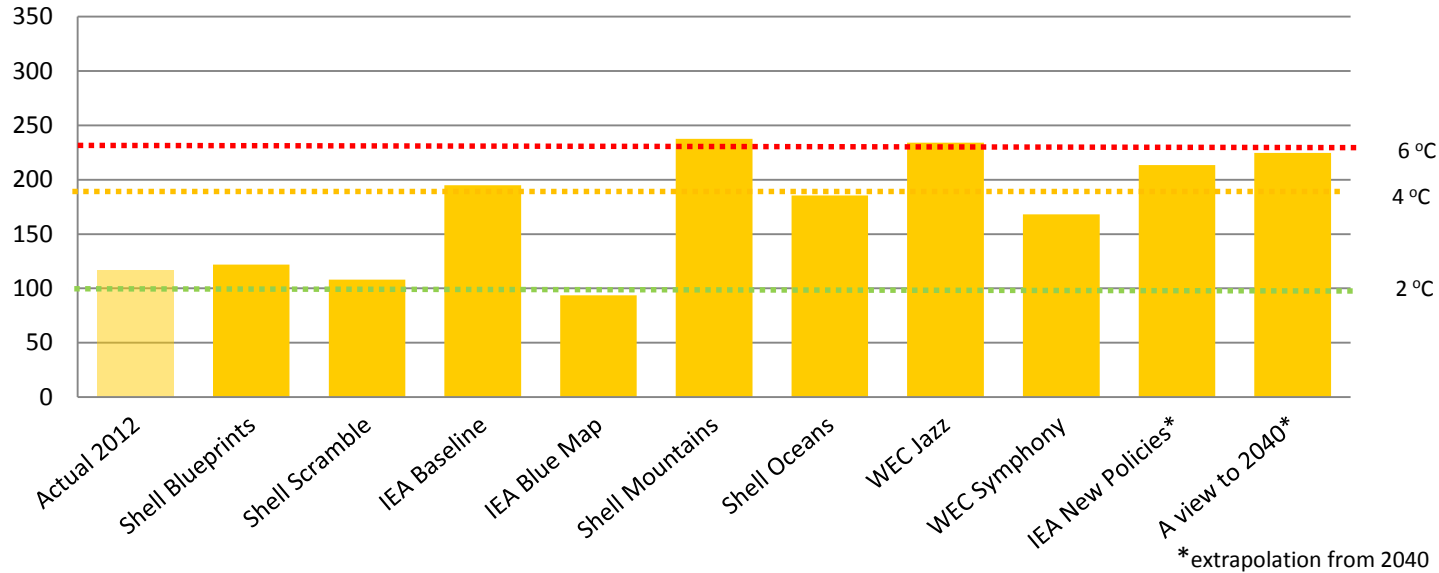
Report headlines

- Energy Scenarios to 2050
- Key Technical and Market Developments
 - Global LNG, Unconventional gas, gas and renewables, gas for transport
- Key Policy Developments
 - Energy security, environmental and climate policies
- Conclusions and recommendations
- Visions from IGU Wise Persons:
 - Coby van der Linde
 - Daniel Yergin
 - Nobuo Tanaka

Energy Scenarios to 2050 (1)

EJ

Natural Gas in 2050



All major energy scenarios are positive about long-term future for gas (BP, IEA, WEC, Shell, ExxonMobil)

Energy Scenarios to 2050 (2)

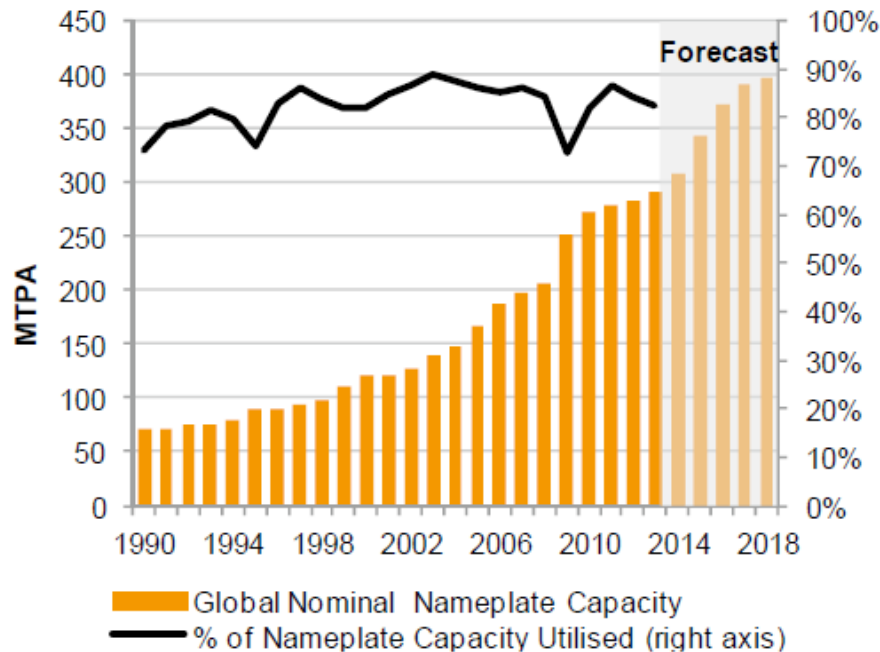


Does this mean that we can look forward to a Golden Age for Gas?

Key Technical and Market Developments (1)

Global LNG

- New capacity on stream
- Floating LNG
- More Liquid market
- Challenge of high production cost



Global Liquefaction Capacity Build-Out, 1990-2018

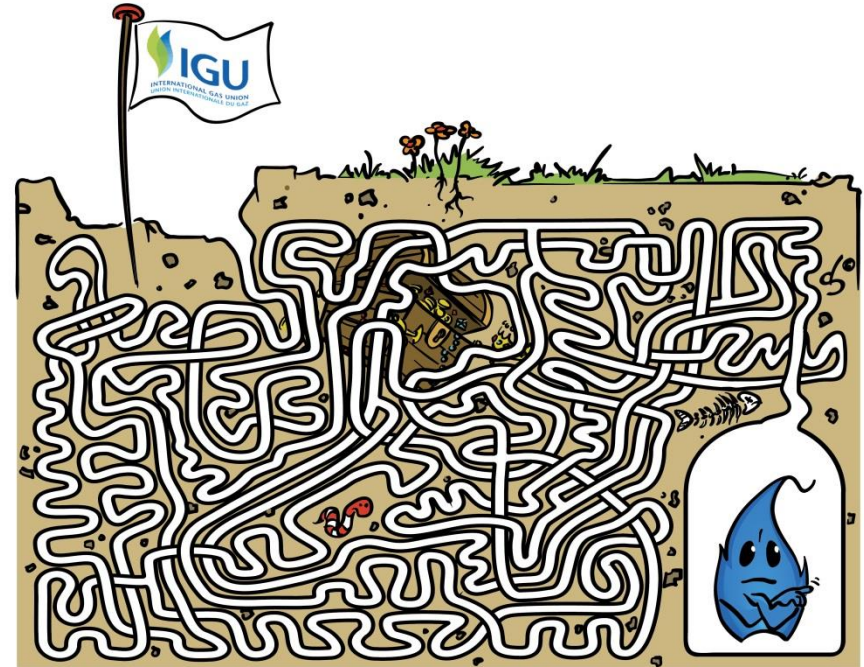
Sources: IHS, IGU, Company Announcements

Key Technical and Market Developments (2)

Developments in unconventional gas:

- Increased opportunities to release trapped gas
- Shale gas
- Coal bed Methane
- Gas Hydrates

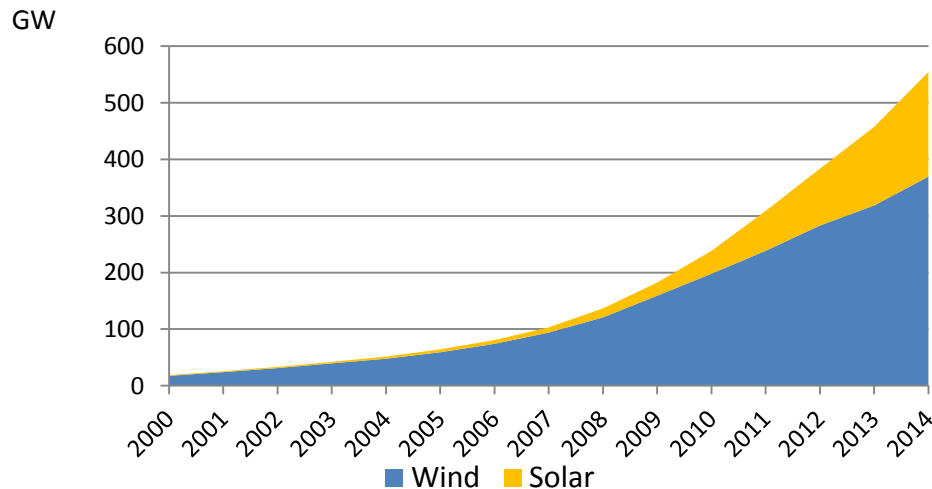
Stakeholder management and reducing footprint is key



Key Technical and Market Developments (3)

Gas and renewables

- Growth in intermittent renewables, in particular solar
- Changing role for gas
- Partner with renewables



Sources: EPIA, GWEC



Key Technical and Market Developments (4)

Gas for Transport

- Alternative to oil-based fuel, large potential in heavy duty vehicles including shipping
- Lower emissions (CO₂, NO_x, sulphur, particulate matter) and noise reduction
- Challenges: infrastructure, regulation and oil versus gas price



Key Policy Developments (1)

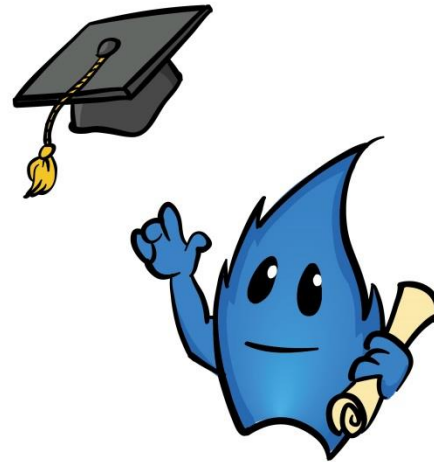
Energy Security

- Geopolitical issues
- Ample (unconventional) supplies
- Growth in LNG Trade
- International collaboration

Environmental policies (“pollution”)

- Positive compared to oil and coal
- Negative compared to renewables
- Important: reasonable price

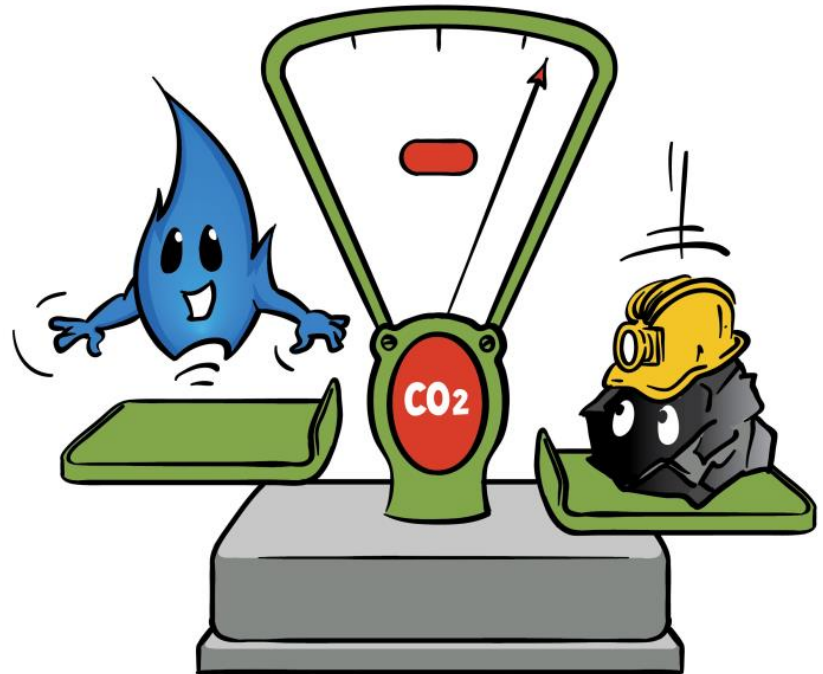
IMPORTANCE OF R&D, KNOWLEDGE SHARING
AND CONTINUOUS LEARNING



Key Policy Developments (2)

Climate policies (CO₂)

- Uncertainty in policies
- Carbon pricing
- Minimizing methane emissions/footprint
 - Reducing flaring
 - Footprint reduction



Conclusions and Recommendations



Many opportunities for bright future but strong continuous efforts required to make it a reality

Industry needs to:

- ✓ Continue to bring down costs (in particular in LNG) to remain competitive
- ✓ Continue to reduce environmental impact of gas
- ✓ Embrace innovation and renewables
- ✓ Reduce interdependencies
- ✓ Demonstrate and advocate

Thank you for your attention!

