Opportunities and challenges for natural gas in future energy systems

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Tipping the energy world off its axis

Four large-scale upheavals in global energy set the scene:

- The United States is turning into the undisputed global leader for oil & gas
- Solar PV is on track to be the cheapest source of new electricity in many countries
- The future is electrifying, spurred by cooling, electric vehicles & digitalization
- China’s new drive to “make the skies blue again” is recasting its role in energy

All of these are providing a new policy and market context for natural gas

There are many possible pathways ahead & many potential pitfalls if governments or industry misread the signs of change

- New Policies Scenario (where we are heading)
- Sustainable Development Scenario (reaching climate, access & air quality ambitions)
The strong growth in gas demand in 2017 was not driven by the power sector, but by greater use in industry & buildings; China accounted for 30% of the increase in global gas demand.
Combustion emissions from gas are low

Compared with other sources, natural gas makes only a minor contribution towards today’s combustion-related emissions.
A world in motion.. China’s switch to a cleaner energy mix plays a major role in driving global trends

Change in world energy demand by fuel, New Policies Scenario

Low-carbon sources & natural gas meet 85% of the increase in global demand: China’s switch to a cleaner energy mix plays a major role in driving global trends
Asia’s growing gas import requirements are largely met by LNG, with exports from the US accelerating a shift towards a more flexible, liquid global market.
The potential upside for conventional gas production in South America is led by Brazil, mostly associated gas, but the major upstream gas opportunity is shale in Argentina.
The “Golden Rules” are principles that can allow governments, industry & others to address potential environmental & social impacts from unconventional gas development:

- Measure, disclose & engage
- Watch where you drill
- Isolate wells & prevent leaks
- Treat water responsibly
- Eliminate venting, minimise flaring & other emissions
- Be ready to think big to capture benefits & mitigate risks
- Ensure a consistently high level of environmental performance
The lifecycle emissions of gas are lower than coal.

Greenhouse-gas emission intensity of natural gas compared with coal:

- Coal better than gas
- Gas better than coal for electricity only
- Gas better than coal
- GWP$_{100}$ from IPCC (2014)
- GWP$_{20}$ from IPCC (2014)

The global average emission intensity of gas is low enough to result in fewer GHG emissions than coal regardless of the timeframe considered, but is beating the most carbon-intensive fuel enough?
Gas is resilient in a changing energy world

Gas is the only fossil fuel that ends up higher in 2040 than today in the Sustainable Development Scenario, although its contribution varies widely across regions, between sectors and over time.
Conclusions

- Natural gas demand bounced back in 2017, spurred by China & ample availability: the composition of demand growth is shifting away from power generation.

- The versatility of gas means that it is well placed to grow in different scenarios, but competition is strong & affordability is key for prospects in emerging markets.

- The contours of a new, more globalised gas market are becoming visible, with LNG – US LNG in particular – acting as the catalyst for change.

- Development of Argentina’s rich shale gas potential can be a game-changer for gas across South America.

- The long-term role of gas will be shaped not only by the pace of energy transitions, but also by the success of efforts to minimise the environmental footprint of gas use.