The IEA outlook for gas

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Market Trends and Projections to 2018
Gas slows down but still expands its role

- Global gas consumption grows at 100 bcm/year, or a Russia in 5 years.
- 5 year growth revised down by 70 bcm, due to EU demand and Middle East/Africa supply.
- At 2.4%/year, gas is growing faster than oil or overall energy use but continues to fall behind coal.
- Transportation emerges as a major demand driver, accounting for 10% of gas demand growth, driven by China and the United States.
The United States continues to dominate non-conventional development

- Technological improvements in seismic, drilling and fracking
- “Mass manufacturing” methods in oil field services
- Strong financial boost from liquids

With US markets saturated, Canadian production growth depends on LNG exports
Recovery of gas prices causes a blip in the march of gas

Gas and coal fired power generation in the US, historical and projected

In the absence of constraints on coal-plant operation, power-sector emissions increase by 120 million tons, despite shale gas
Security issues, depletion and domestic demand growth lead to tight LNG supply

Supply shortfalls double the market impact of Japanese demand increase
New LNG supply is predominantly backed by long-term contracts

Portfolio LNG and secondary re-exports both play an increasing role
Projects in advanced stage could transform the US into the number 3 LNG exporter (after Qatar and Australia)

Japanese utilities have signed contracts equivalent to the post-Fukushima demand increase
China: air quality is emerging as the key question and gas is the answer

Every year till 2018

- New gas heating in 3.5 million homes
- 7 million tons of industrial coal consumption replaced by gas
- A new CCGT in every 6 weeks (but a new coal plant every week)

China adds the combined gas demand of Germany, France and Belgium in 5 years, equivalent to 27% of global demand growth
Chinese non-conventional gas developments can not keep up with demand

- Complex geology
- Population density in Sichuan, water scarcity in Tarim/Ordos
- Open regulatory issues
- Large investments in coal gasification (25 bcm by 2018)

China adds almost the gas output of the Netherlands, but with only 100 shale wells so far the shale ramp-up is beyond 2020
China adds the current German imports to its import need

- Myanmar imports remain upstream constrained
- Russian imports unlikely before 2020
- Central Asia: expanding infrastructure but high prices

China absorbs all the production increase in Central Asia and one third of the global increase of LNG supply
Russian gas: the East is the manifest destiny?

• Production constrained by EU and domestic demand
• Surging independent production backed by NGLs
• Asian exports depend on capital-intensive infrastructure
Japan: nuclear restoration stabilizes LNG demand and eliminates demand rationing

Projected nuclear restoration is equivalent to a 45 billion dollars Australian LNG project
Europe: Policy-driven decommissioning of old coal plants enables gas to recover

Gas and coal fired power generation in Europe, historical and projected

Gas plant utilization remains below the level expected at the time of investment
Climate policy design impacts the role of gas

Power mix in Europe, with the same CO2 emissions

If 25% lower imports have a bigger price impact than 0.8 $/mbtu, renewable subsidies are paid by a lower gas bill.
Shale gas in Europe: ramping up by a factor of 100?

Shale well drilling

- Poland
  - 2012
  - 2013

- Eagle Ford in a typical week in 2012
Natural gas in transport has a bigger impact on oil demand than biofuels and electric cars combined

- Not a new technology
- GTL: capital intensive but no further barriers
- CNG: easier infrastructure, but wide coverage needed
- LNG heavy trucks: very large potential, expensive infrastructure
US: rolling out the infrastructure

- Increasing market share for CNG buses
- Broad range of LNG trucks is becoming available
- Large investments in infrastructure
- Technological progress in refilling and small scale liquefaction
- Watch out for railroads

Due to infrastructure costs, after the rollout, the wholesale gas price will have little impact on competitiveness
Despite import dependency and slow ramp up of shale, China goes for gas in transport

- Concerns about particulate emissions
- Large concentrated mass transit systems
- Simultaneous rollout of pipeline and refilling infrastructure

*The ramp-up of gas as a transport fuel in China is 4 times the growth of the US*