NATURAL GAS
MARKET REVIEW

2009

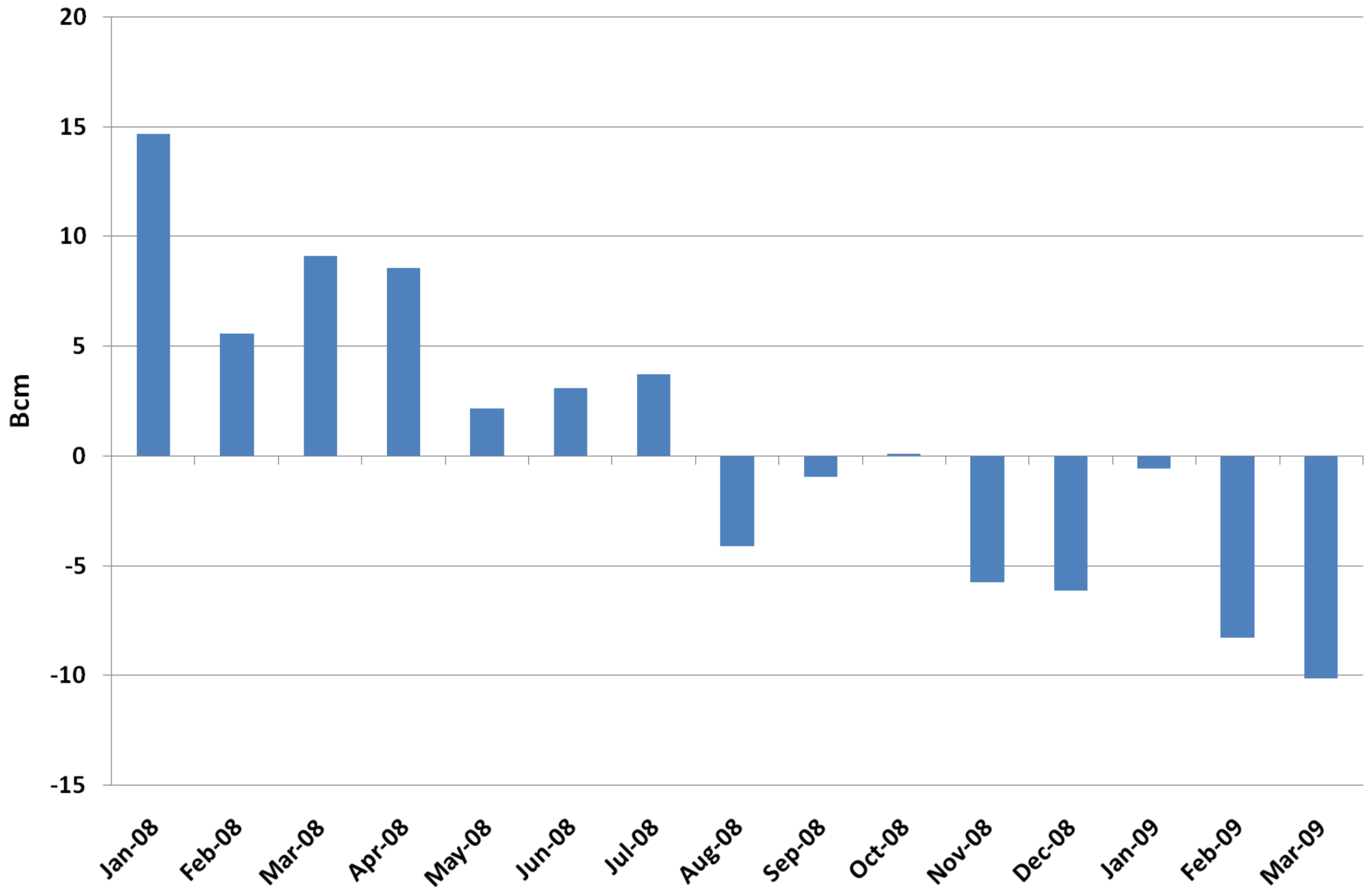
INTERNATIONAL ENERGY AGENCY

2009 – Changing the scene

- **Gas demand in Europe and in other major economies is weakening**
  - **Industrial demand down heavily**
  - **Demand in the power generation sector holds up where prices respond**
- **Over 60 bcm of new liquefaction capacity will come on line in 2009**
  - **Where will this be sold?**
- **Spot prices have come down sharply**
  - **From $13/MBtu to around $4/Mbtu**
  - **Oil-linked gas prices will bottom at $6-7/Mbtu this summer**
- **Unconventional gas developments in North America have changed the scene**
  - **For how long at current price levels?**
- **Gas markets are becoming more interdependent, but regional issues remain**

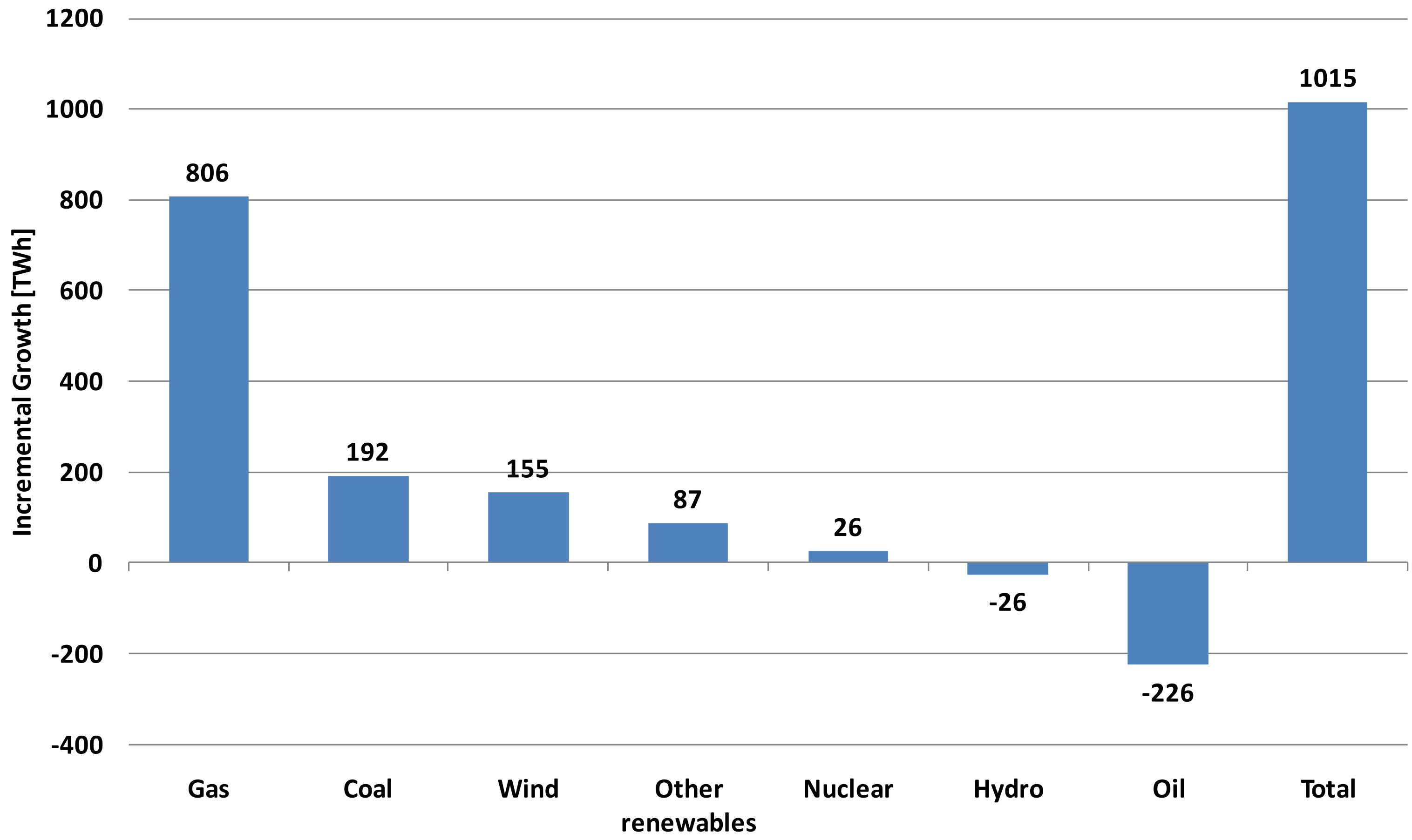
OECD Gas Demand

No sign of green shoots



Source: IEA, NGMR 09

Gas – Main contributor to growth in electricity output in OECD this decade



Source: IEA

Gas supply highlights

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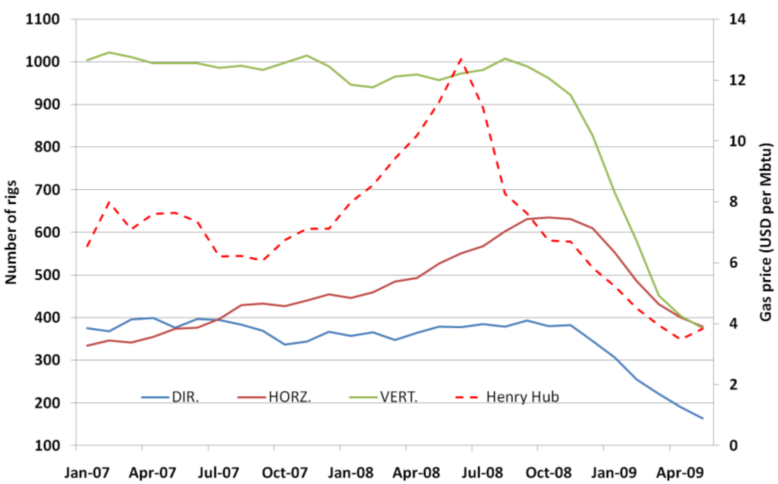
- OECD Production increased by 4% in 2008
  - All OECD regions are import dependent
  - Europe and OECD Pacific depend more on non-OECD gas supplies than North America
- Production increased strongly in North America
  - Strong growth of US unconventional gas production (+50 bcm)
- Production increased moderately in OECD Europe
  - Essentially driven by Norwegian production growth
  - Production is already, or will decline in most other European countries

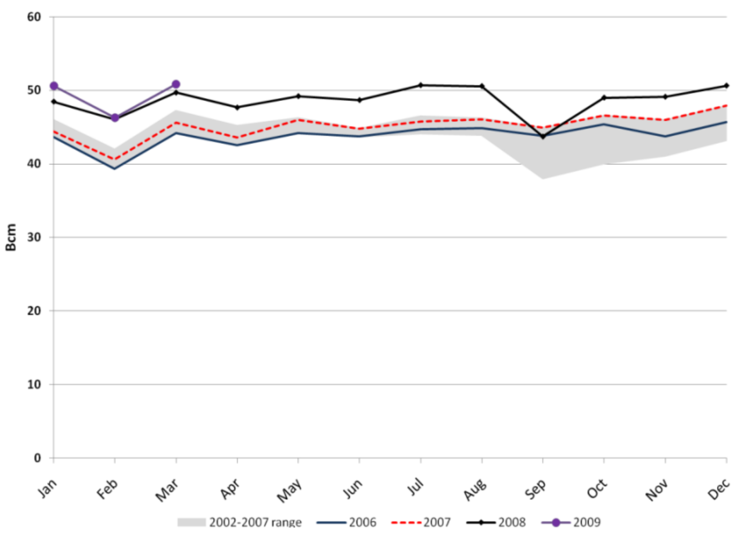
2009's wild card on the supply side
US unconventional gas production

Number of rigs vs. HH prices



Source: IEA, Baker Hughes

US gas production



Source: IEA, EIA

Note: rigs in North America

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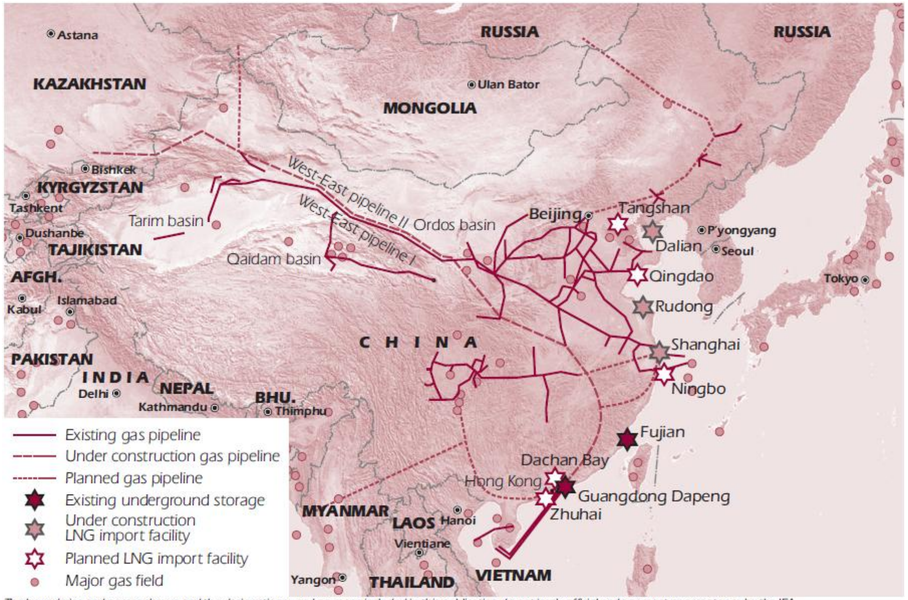
China – Already third biggest non-OECD gas user



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Source: IEA, NGMR 09

- **Chinese gas use at near 80 bcm in 2008**
  - **Up from 69.5 bcm in 2007**
  - **Still less than 4% of Chinese TPES**
- **LNG contracts to import a minimum of 24 bcm of LNG by 2011.**
- **Plans to import up to 40 bcm of Turkmen gas by pipeline**
- **Ambitious targets for production**

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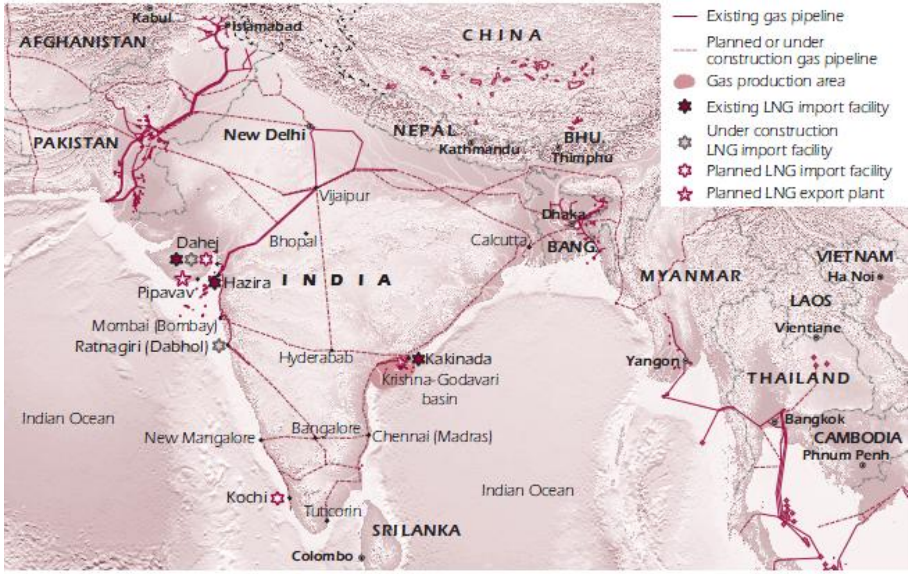
India – Demand could double without supply constraints



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Source: IEA, NGMR 09

- Gas plays a small part in India's energy needs
  - Barely 5% of TPES
- Demand is growing but supply constrained
- Domestic production to double by 2012
- LNG import capacity will increase from 13 bcm to 30 bcm by end-2009
- Domestic prices remain an issue
- Pipeline imports seem unlikely before 2015.

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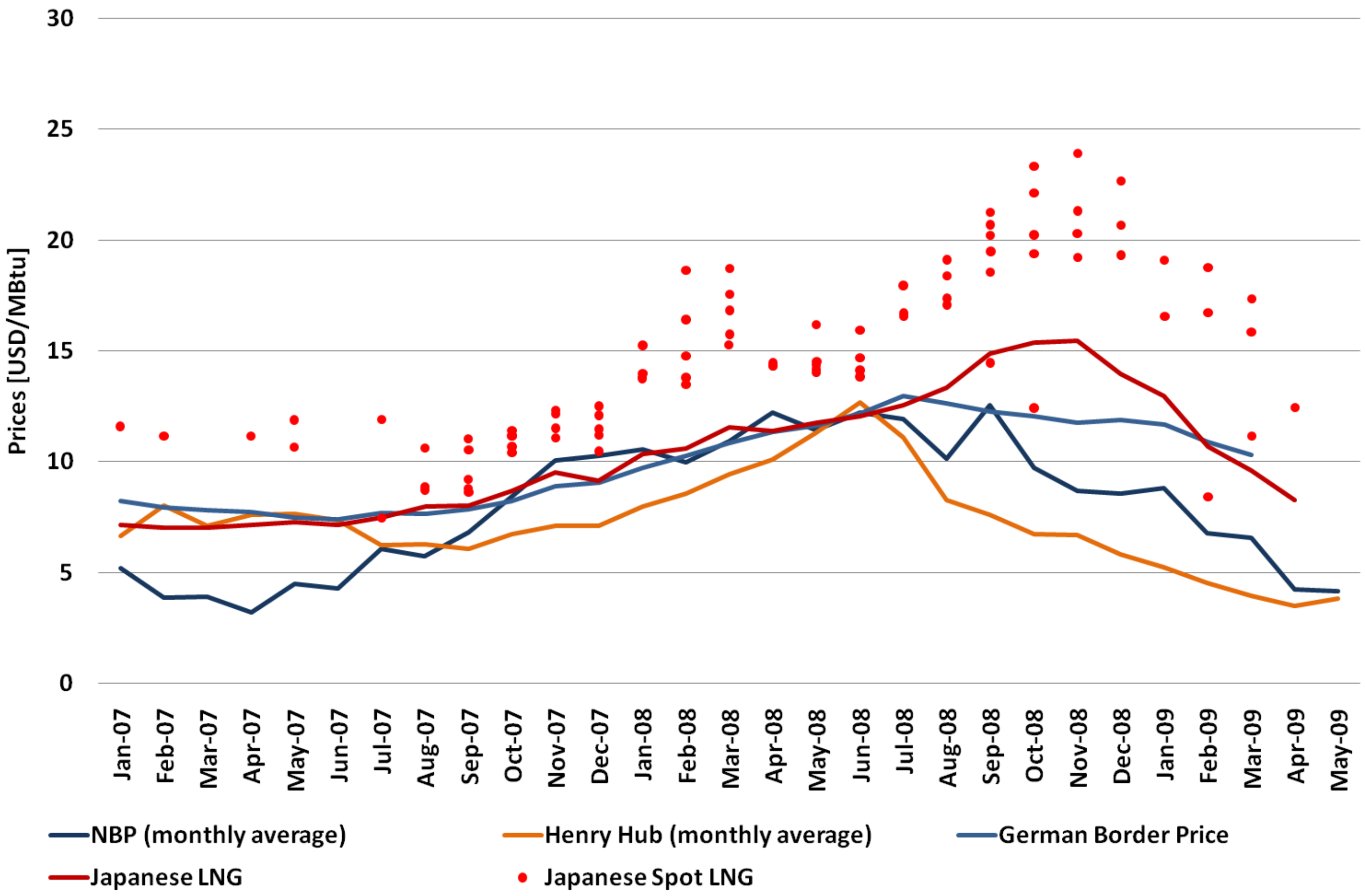
Gas price environment

- **UK and US gas prices fell from USD 13-14 per MBtu in mid-2008, to at or below USD 4 per MBtu mid 2009**

- **Oil-linked gas prices in Continental Europe and Japan have been declining more slowly**
  - **They are expected to fall to around USD 6-7 per Mbtu during summer 2009**
  - **This makes LNG spot cargoes and other spot gas more interesting than oil-linked gas for European buyers**

- **NBP and HH gas prices are showing a degree of convergence due to**
  - **Easing supply and demand balance**
  - **Greater LNG trade linking regions more closely**

Gas prices fall
but at different rates in different regions



Source: Bundesamt für Wirtschaft und Ausfuhrkontrolle (BAFA), ICIS Heren, ICE, Trade Statistics of Japan (Ministry of Finance), European Central Bank, Federal Reserve.

LNG Markets
What happened in 2008-09

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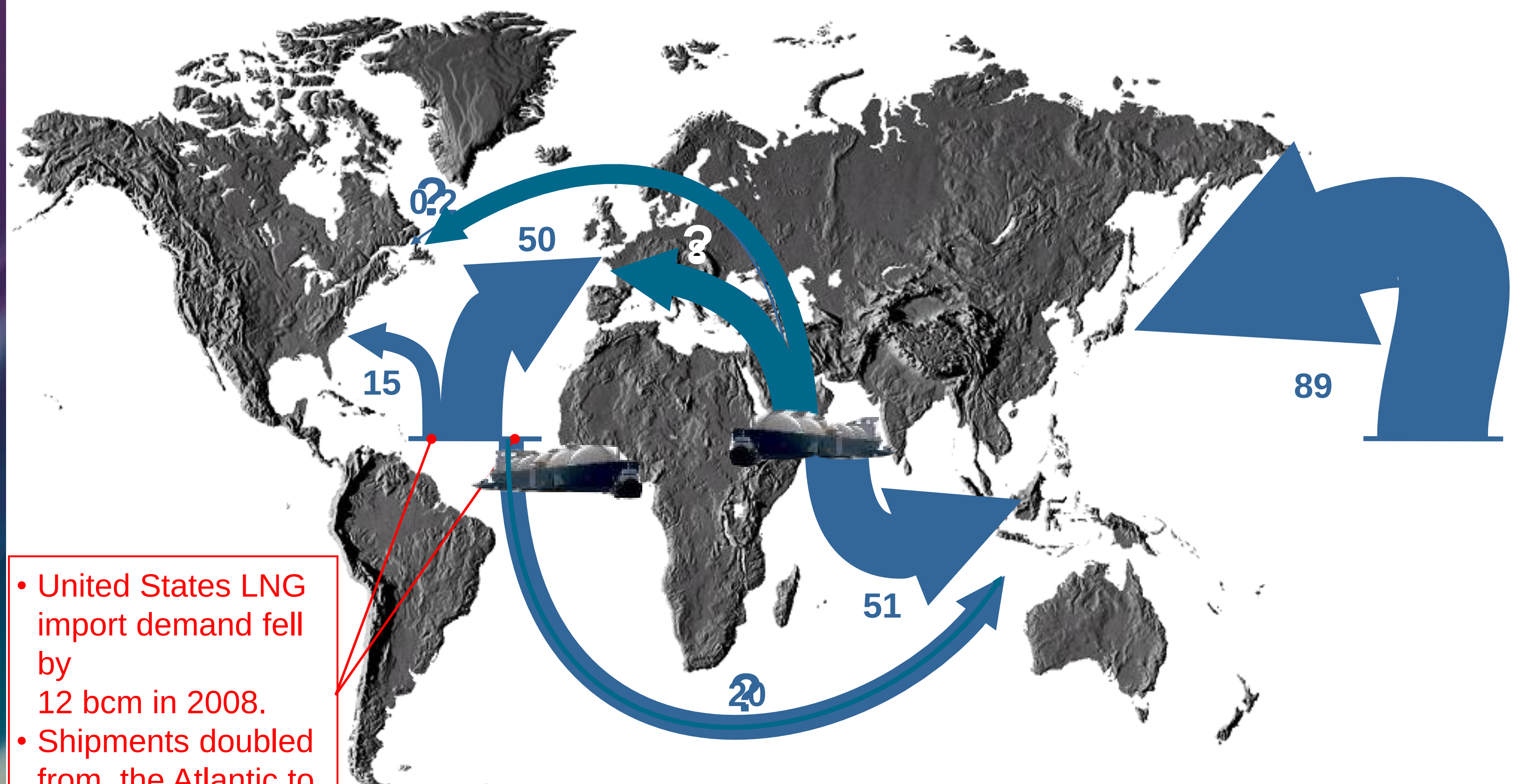
- Strong demand growth, first half of 2008
- Little growth of output
  - Many force majeure problems (Arzew, Nigeria)
- Movements of cargoes from the Atlantic to the Pacific basin
  - Reduction of imports from the US
- In 2009, Asian demand has been declining substantially
  - Japan demand down by 6 - 10% during the first quarter
- More LNG available for the Atlantic basin
  - Demand still limited in the US, but Europe buys more
- Uncertainty for the second half of the year
  - US production? European demand...?

LNG trade movements
What to expect in 2009

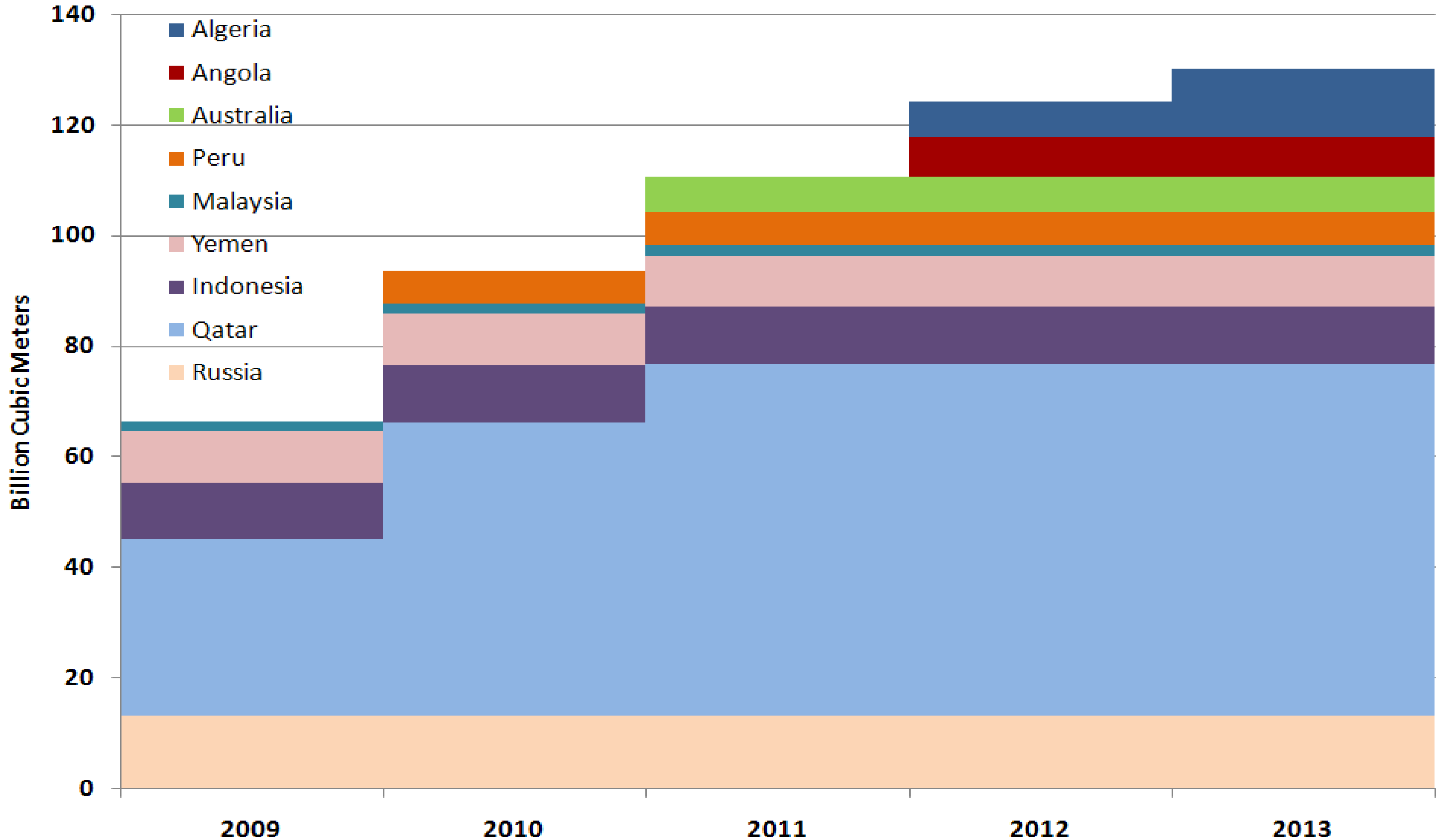


- United States LNG import demand fell by 12 bcm in 2008.
- Shipments doubled from the Atlantic to Asia.
- 2009 could also see large swings.

(bcm – preliminary data)

to \ from	Pacific	Middle East	Atlantic	total	share
Asia	89	51	20	**160**	68%
Europe	-	8	50	**59**	25%
Americas	-	0.2	15	**15**	7%
total	**89**	**60**	**85**	**234**	
share	38%	26%	36%		

Significant liquefaction capacity to start
Capacity does not mean production …



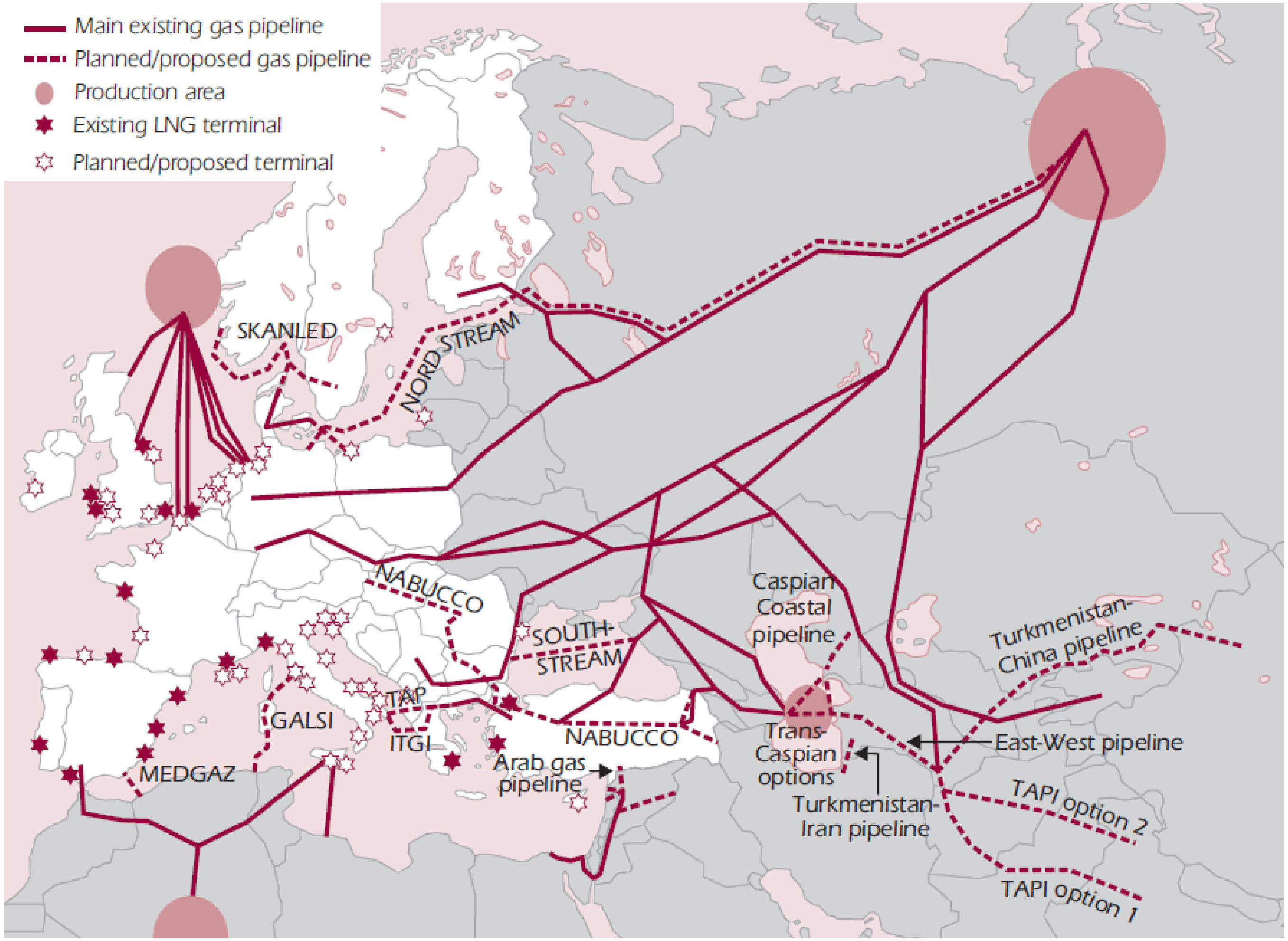
Source: IEA, NGMR 09

Note: Sakhalin II and Qatargas II Train 4 already operational

The investment challenge

- The slow pace of upstream gas development was already a concern prior to the financial crisis
- Current global economic developments will sharply lower producer cash flows (both prices and volumes), while making demand growth more uncertain
- Investments are needed in all parts of the gas value chain to meet future demand needs
  - Capital intensive projects expected to make FIDs in 2009-10 will be the most affected by the current market conditions
- Given the uncertainties, there is a risk that some investments might be postponed
  - Companies reassess priorities and focus on less risky projects
- This could potentially lead to a tighter market
  - Gas demand has the potential to rebound quickly
  - Investments on the supply side are however constrained by long lead times

A lot of infrastructure planned to supply Europe



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Source: IEA, NGMR 09

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Missing Russian volumes amounted to 5 bcm

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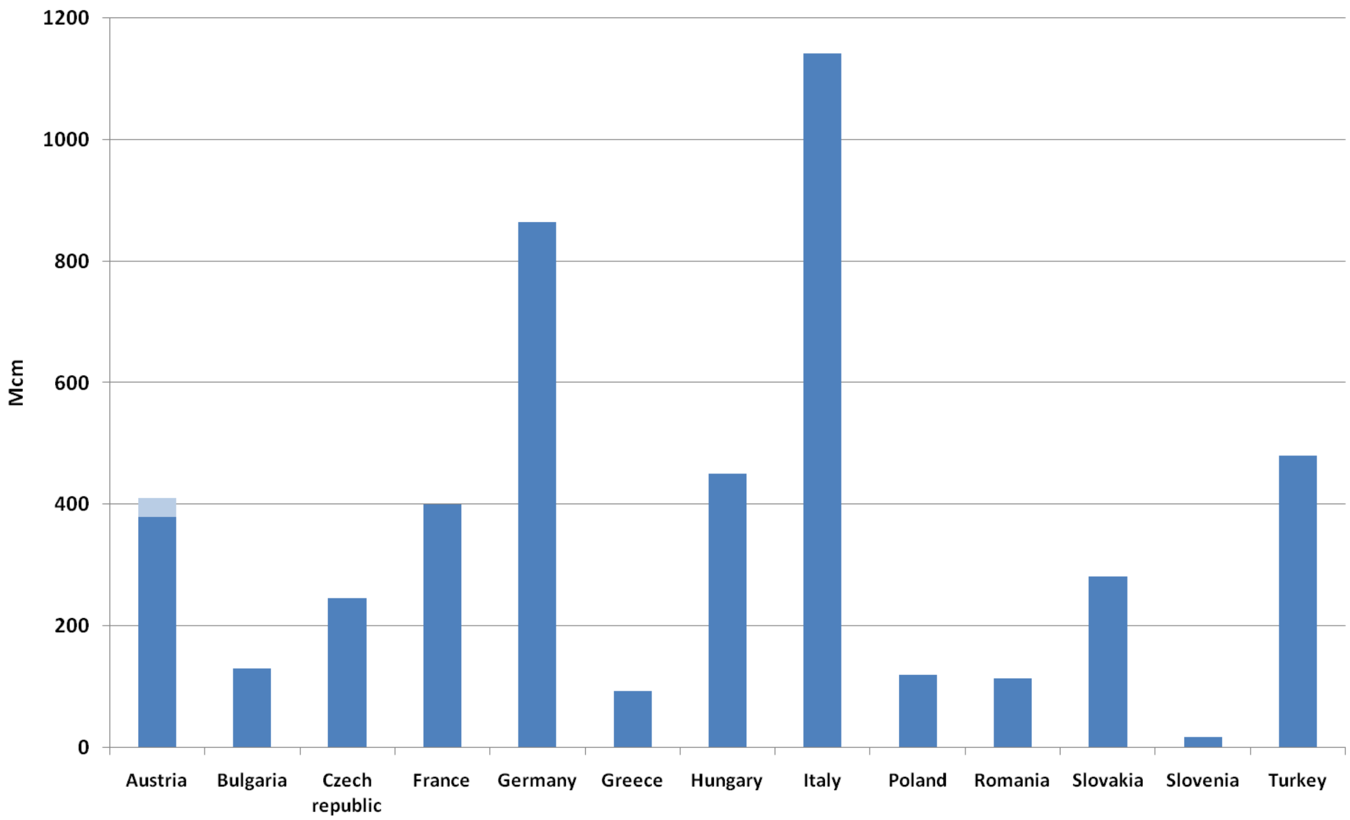

Source: IEA, NGMR 09

Note: Austria estimated

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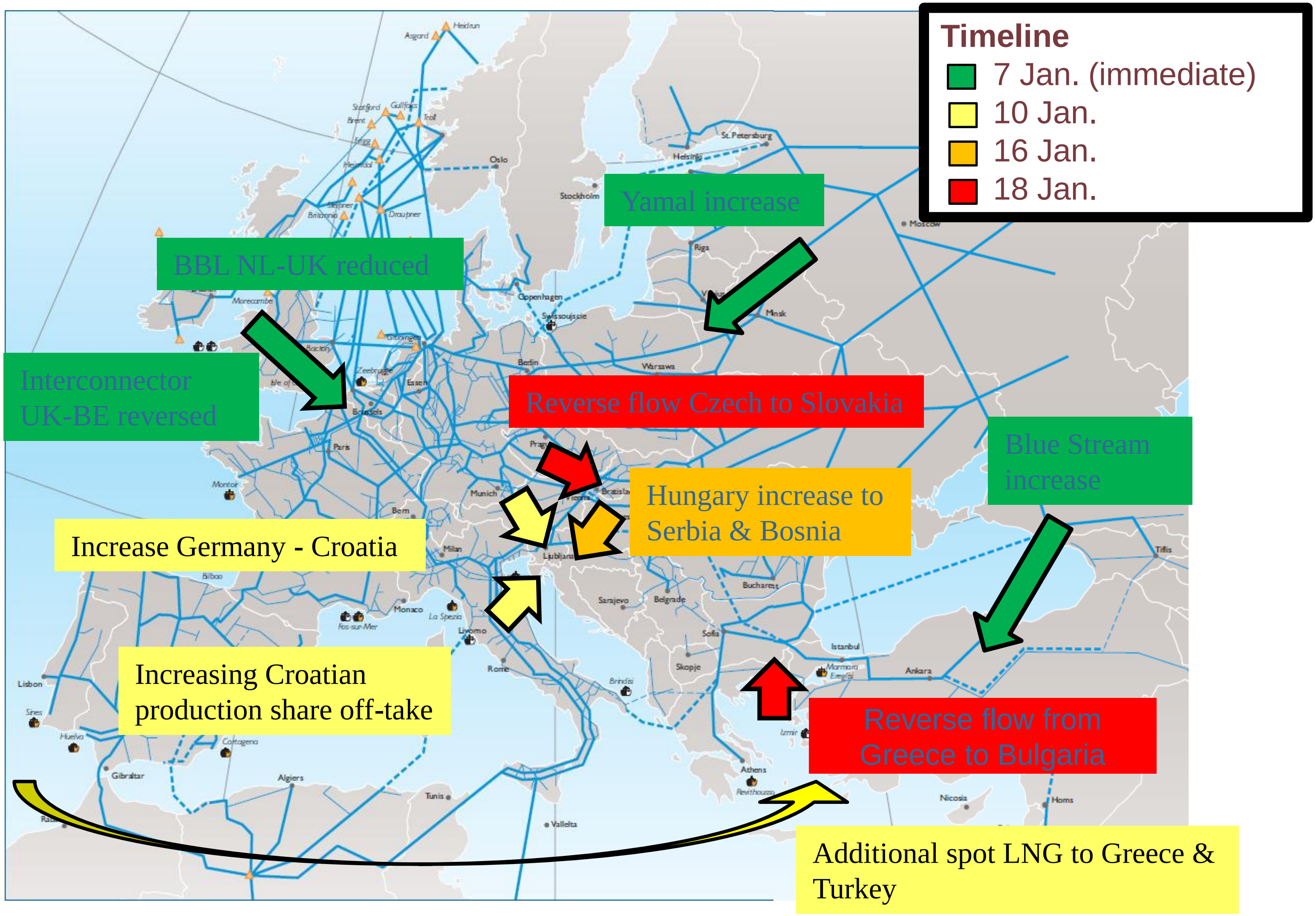
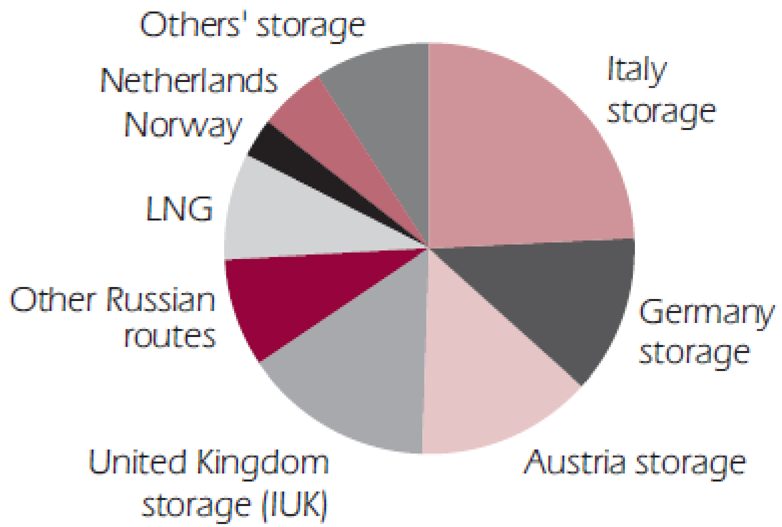
European responses to the gas dispute between Russia and Ukraine



Source: IEA, NGMR 09

How Europe faced the supply disruptions

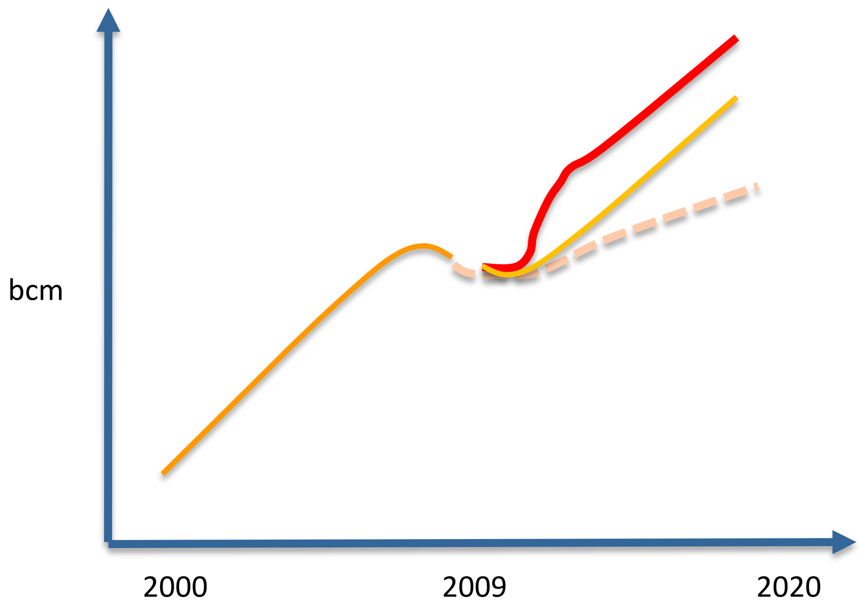


Source: IEA, NGMR 09

- **Storage was key**
- **Additional supplies were provided by**
  - **imports from existing suppliers**
  - **alternative routes**
  - **LNG (SE Europe)**
- **Functioning markets supported by inter-connections are essential to transport gas where it is needed**

What would be the future gas demand path?

- How long will it take for demand to rebound?
- How quickly will it recover?



No investment in power generation and economic recovery lead to increased use of gas for power

Business as usual, gas is the fuel of default

Slow economic recovery, focus on efficiency and non-CO_2 emitting technologies

Source: IEA, NGMR 09

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Spare Slides

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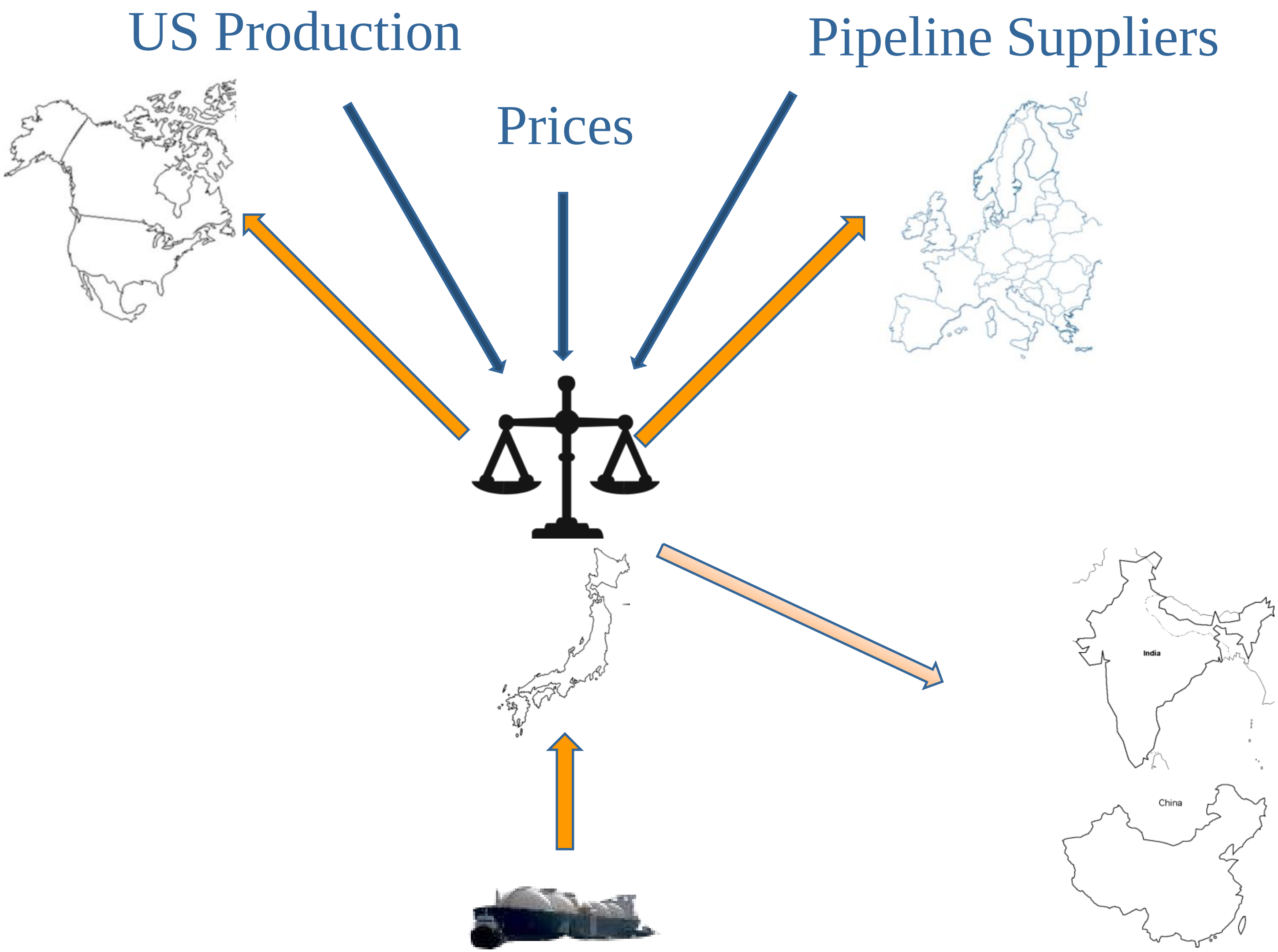
Gas Markets are increasingly interdependent



Investment in producing regions

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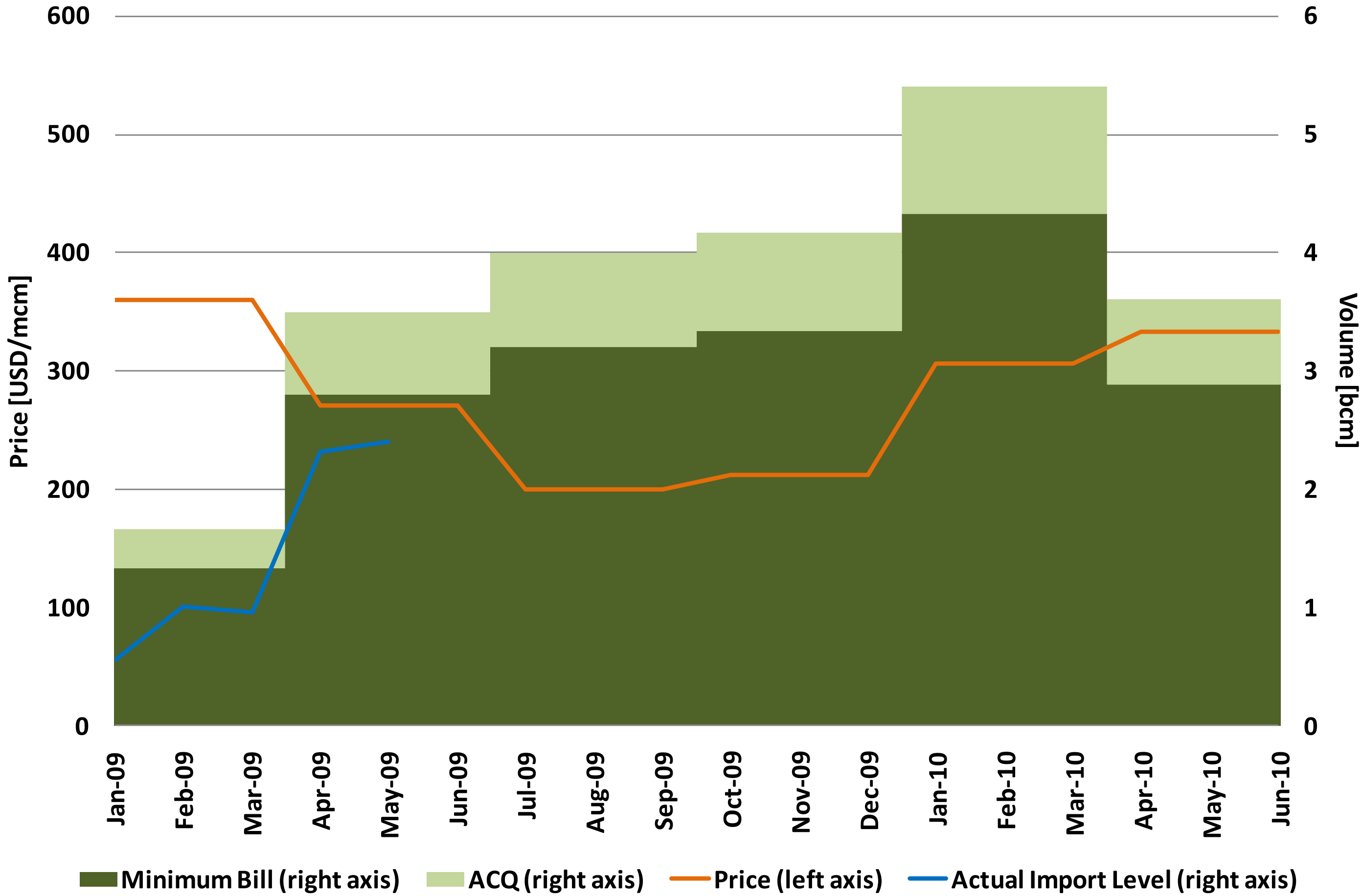
- The slow pace of upstream gas development was already a concern prior to the financial crisis
- Current global economic developments will sharply lower producer cash flows (both prices and volumes), while making demand growth more uncertain
- Looking at the 3 biggest reserve holders
  - Russia: Yamal is crucial to maintaining or expanding production and exports; other new fields, like Shtokman now look unlikely before 2015
  - Qatar is dramatically expanding its gas exports, but the moratorium will limit new output growth until 2015, or even later
  - Iranian incremental production looks set to meet growing domestic demand. Significant exports by pipeline or LNG before 2015 look unlikely.

Up to April'09 Ukraine only imported 15% of its planned annual volume



Sources: IEA