2009 – Changing the scene

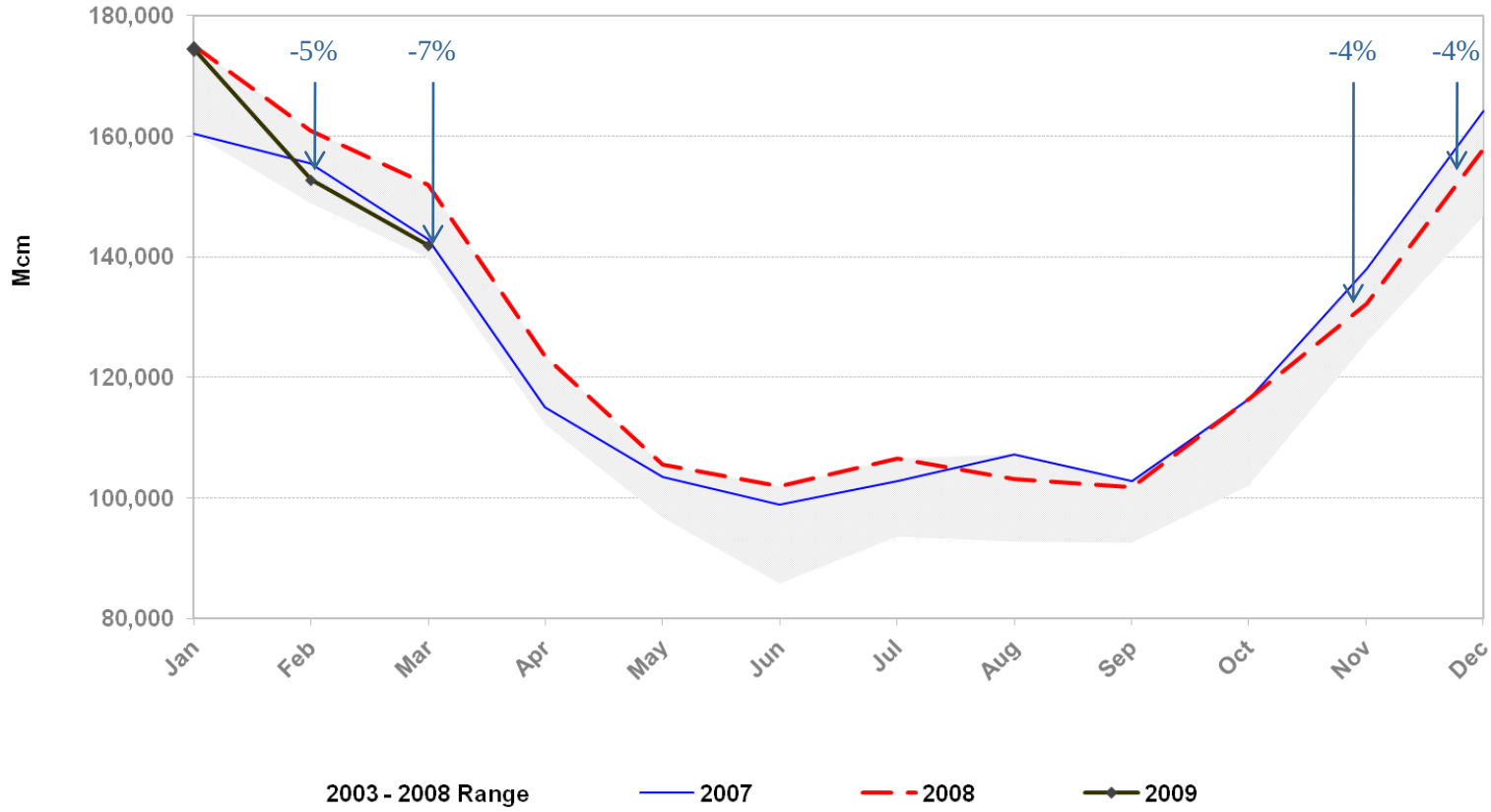
- **Gas demand in Europe and in other major economies is weakening**
  - **Industrial demand strongly affected by the economic crisis**
  - **Demand in the power generation sector suffers from relatively high gas prices early 2009**
- **Over 60 bcm of new liquefaction capacity will come on line in 2009**
  - **How much additional LNG will come to markets?**
- **Spot prices have come down sharply**
  - **From $13/MBtu to around $2.5-/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?**

Gas demand highlights

- **During 2008, we moved from a relatively tight supply and demand balance to an easing one**
- **Gas demand increased by 1% in OECD countries in 2008**
  - **Strong increase in the first half of 2008,**
  - **But decline over the last quarter and in early 2009.**
- **OECD gas demand is expected to decline in 2009**
  - **The industrial sector will be particularly hit**
  - **Demand in the power generation sector depends on the relative gas and coal prices.**
- **Demand is expected to recover in the medium term driven by the power generation sector**

OECD gas demand is weakening

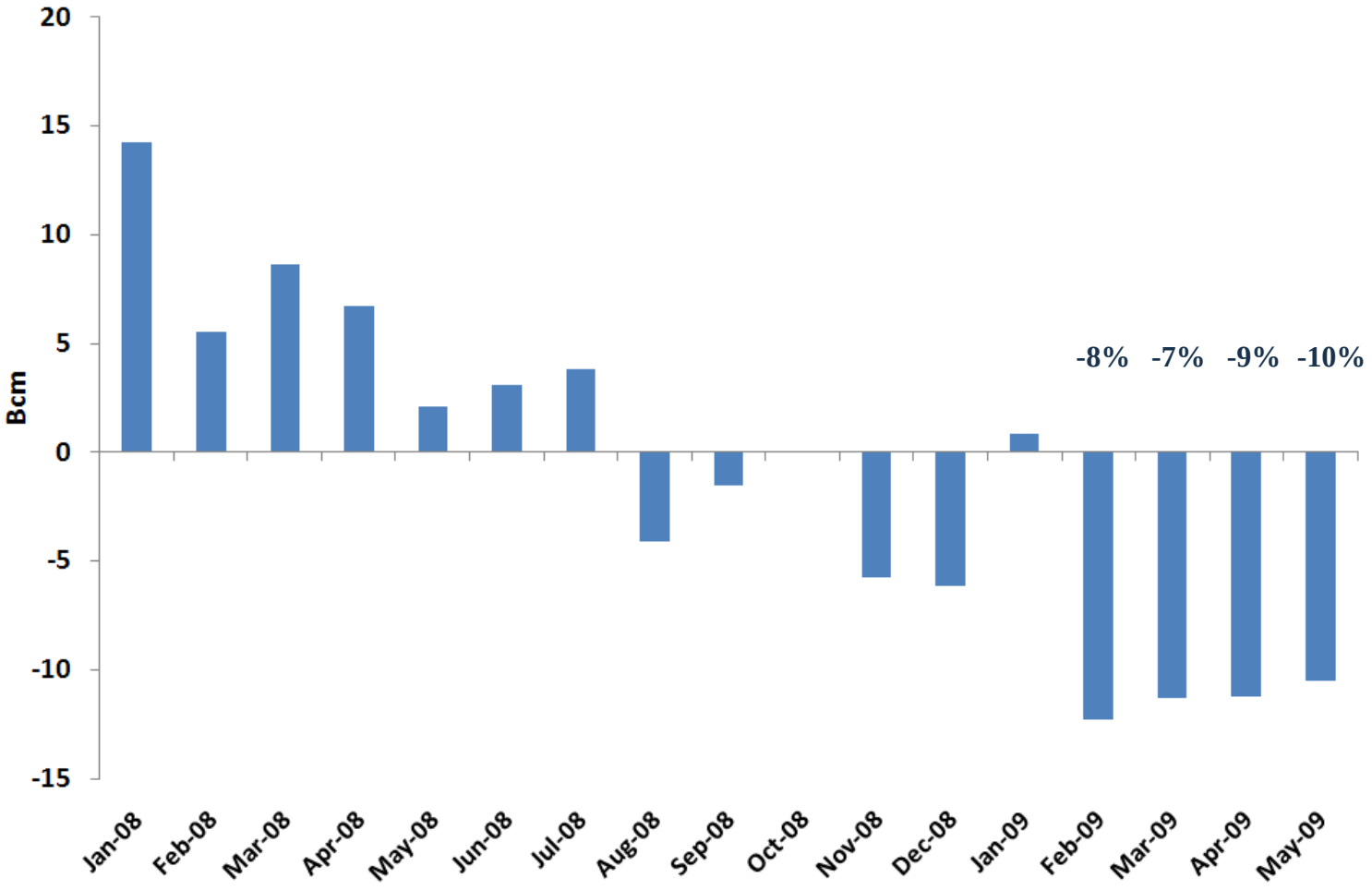
Decline has been accelerating



Source: IEA, NGMR 09

OECD Gas Demand

First half 2009 still weak

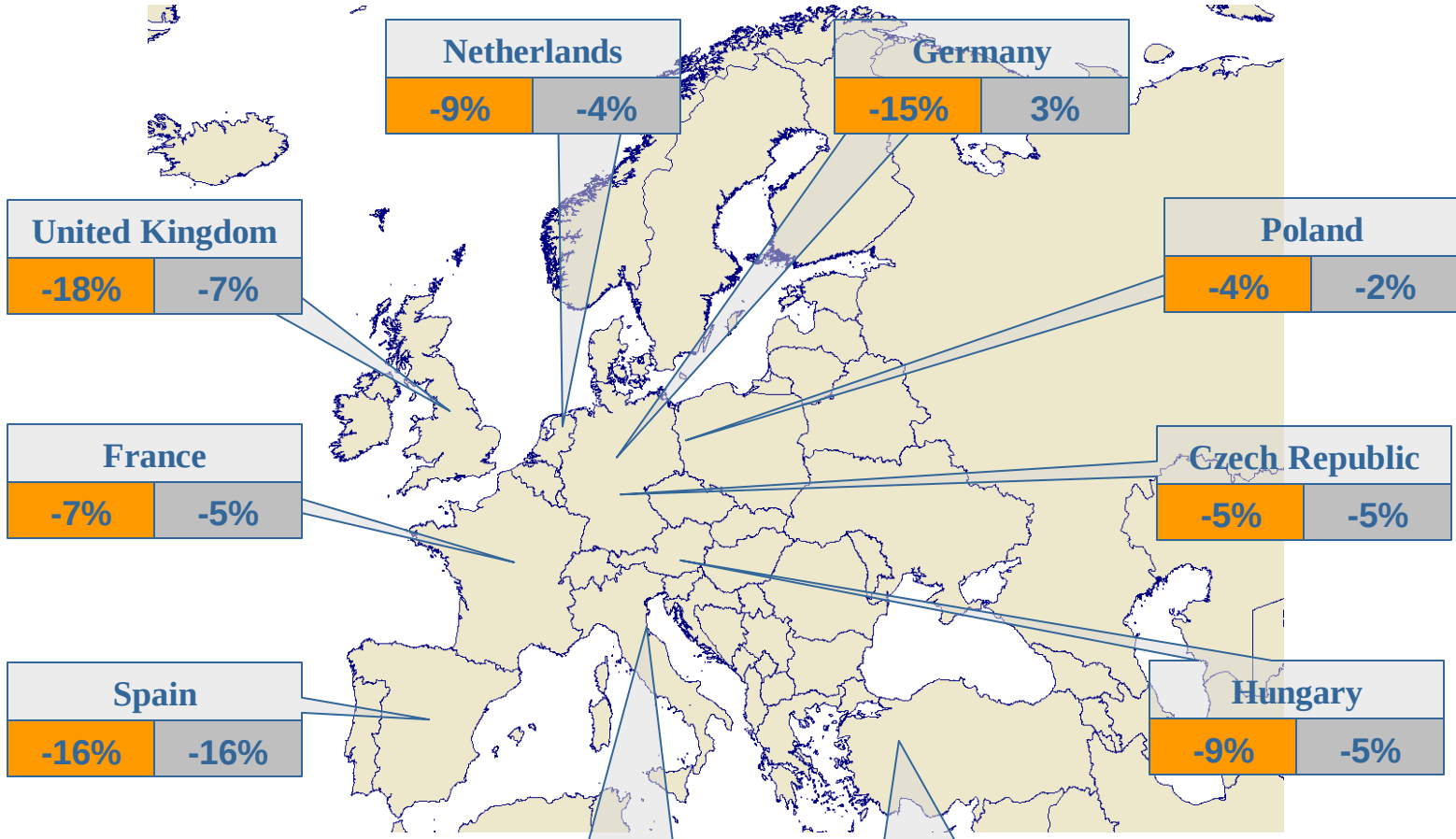


Source: IEA

NATURAL GAS
MARKET REVIEW

2009

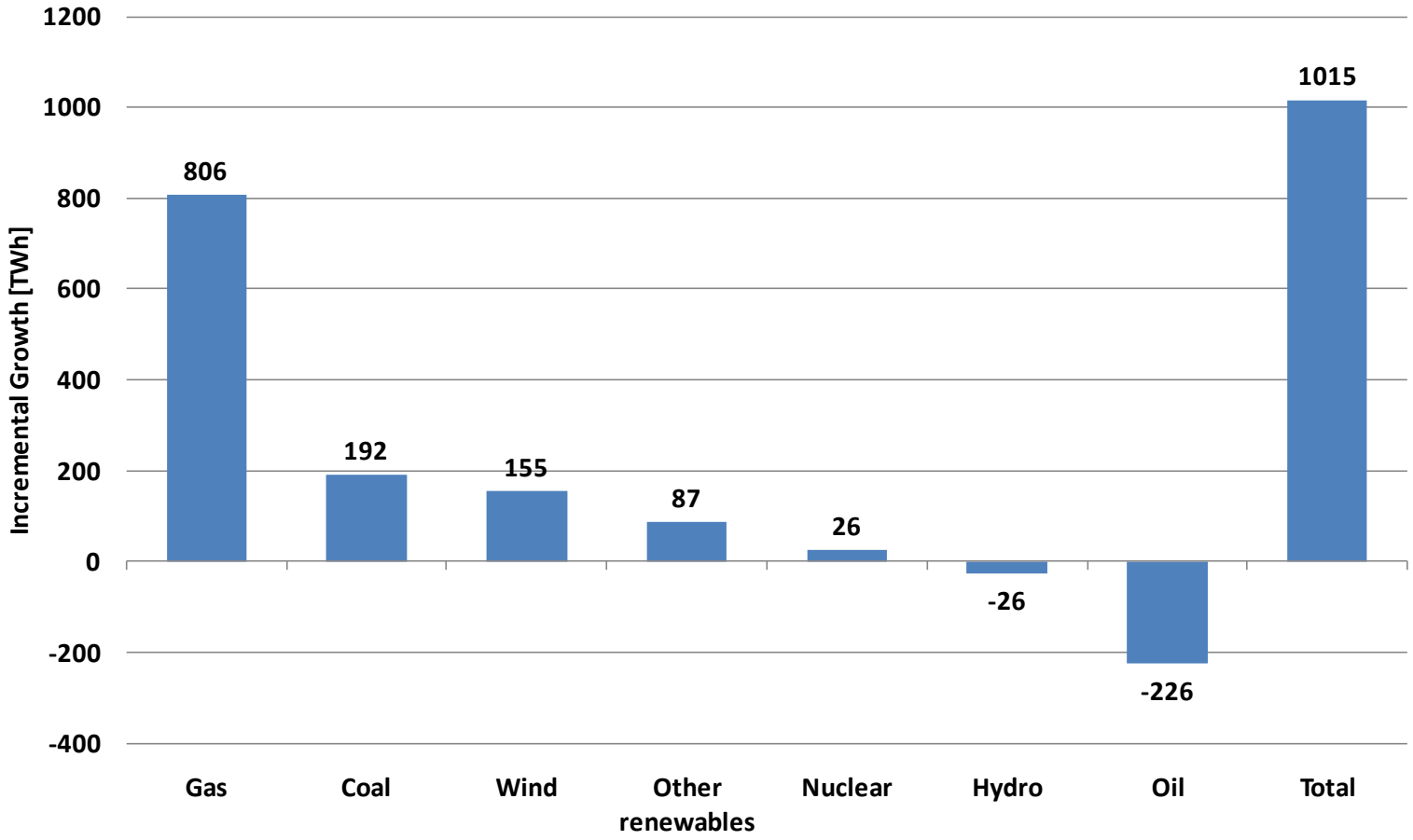
March gas and power demand down over most of Europe



Source: IEA

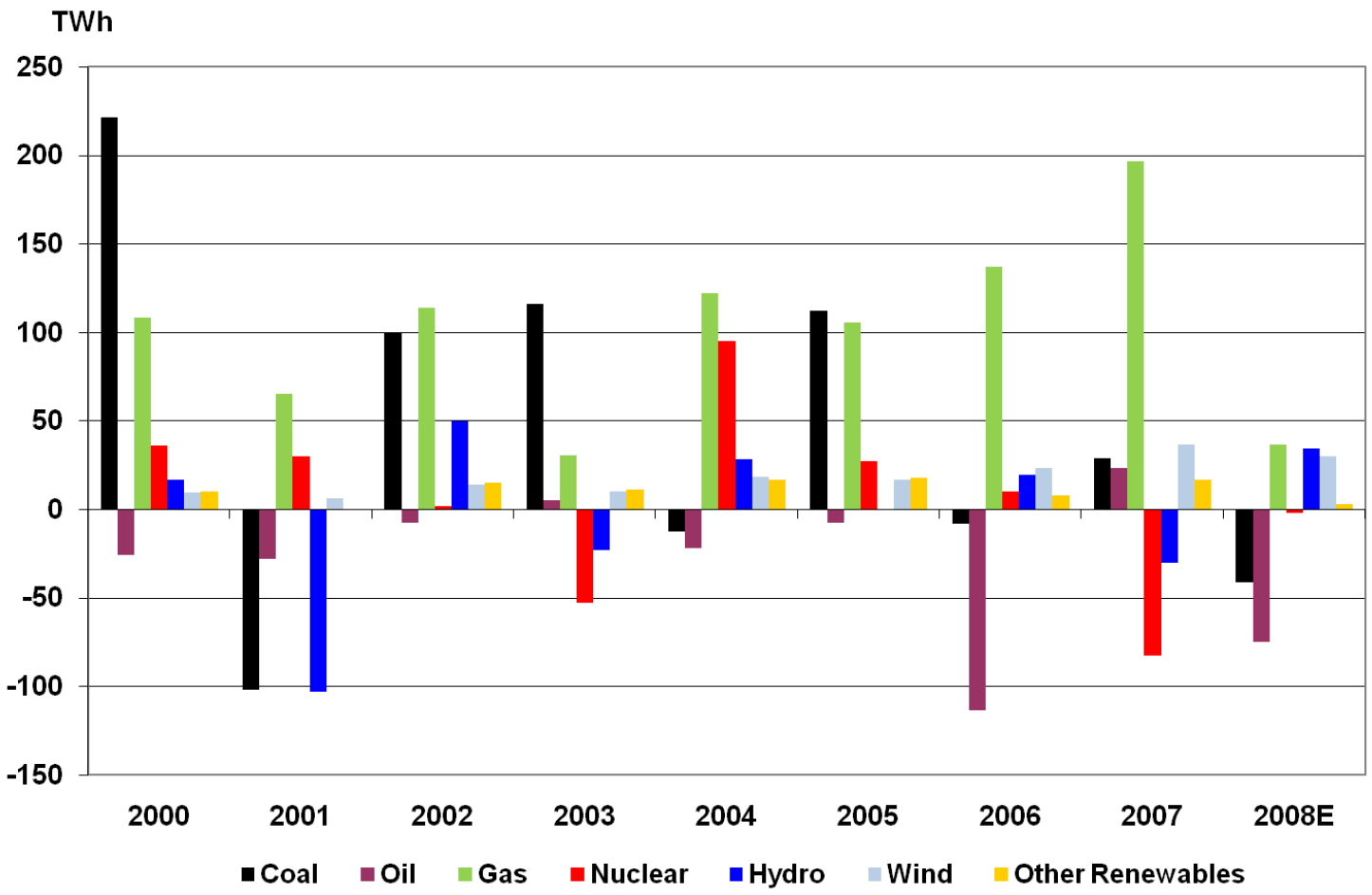
Note: compared to previous year

Gas – Main contributor to the 2000-08 growth in electricity generation



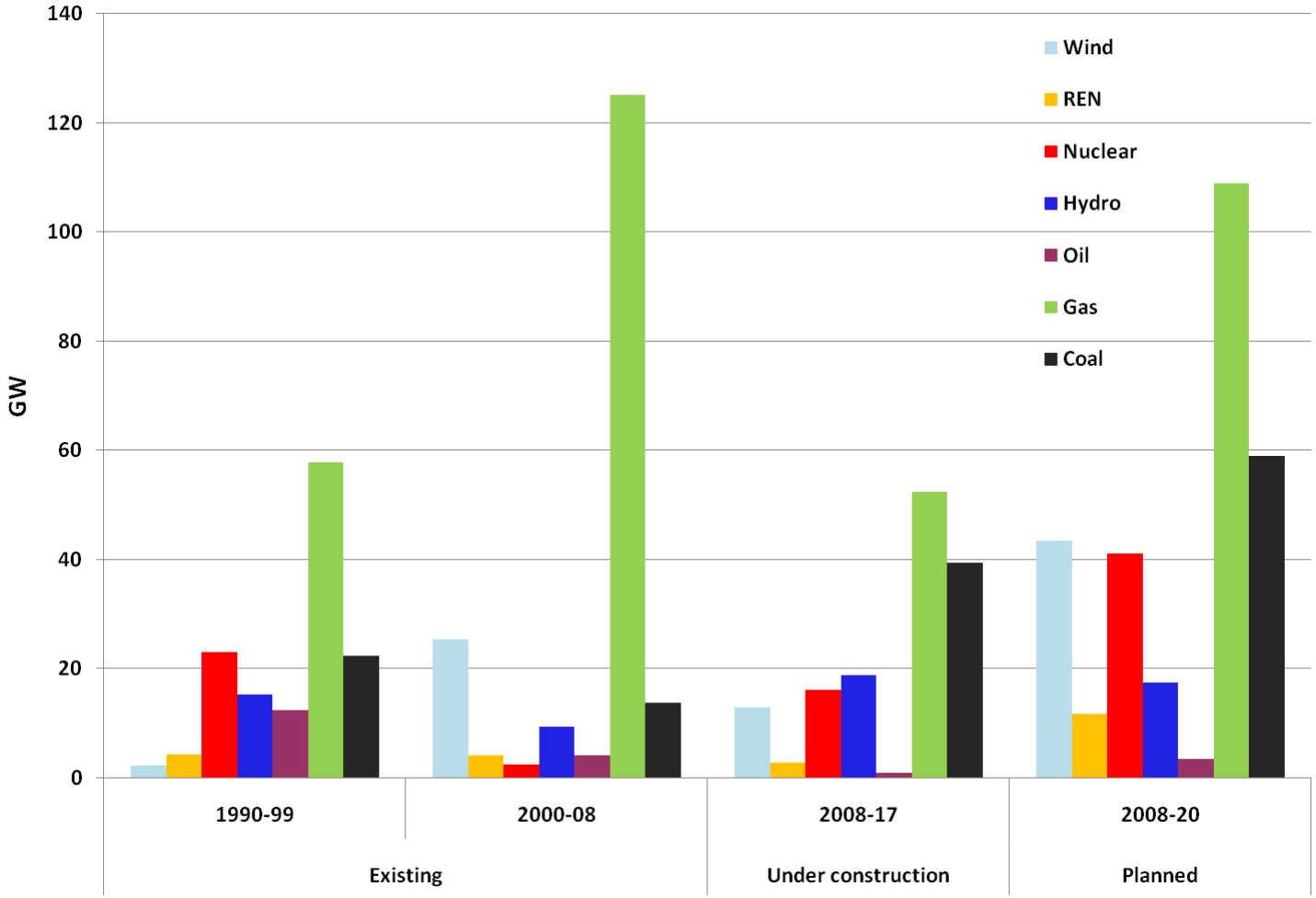
Source: IEA

Gas demand growth in the power generation sector has slowed down



Source: IEA, NGMR 09
Note: OECD countries

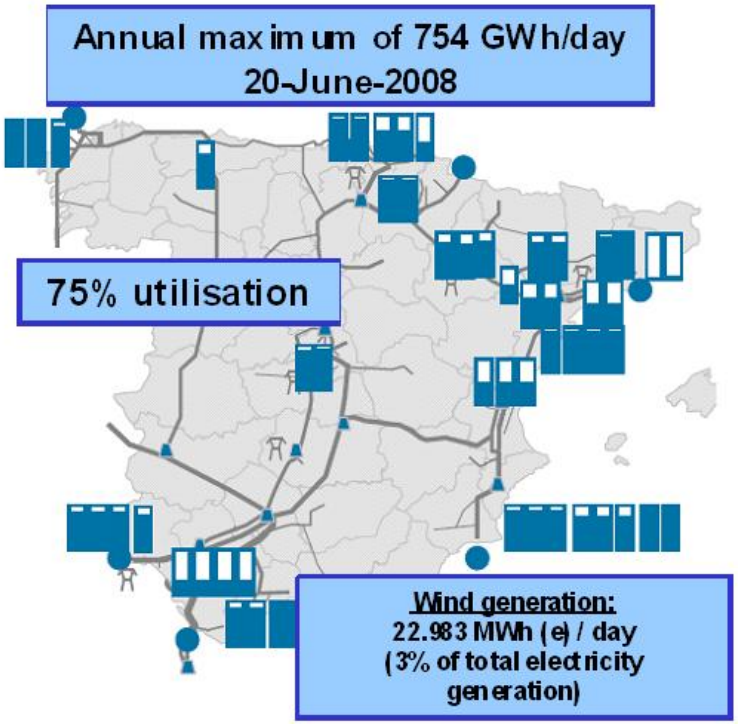
Gas is still the fuel of default in OECD



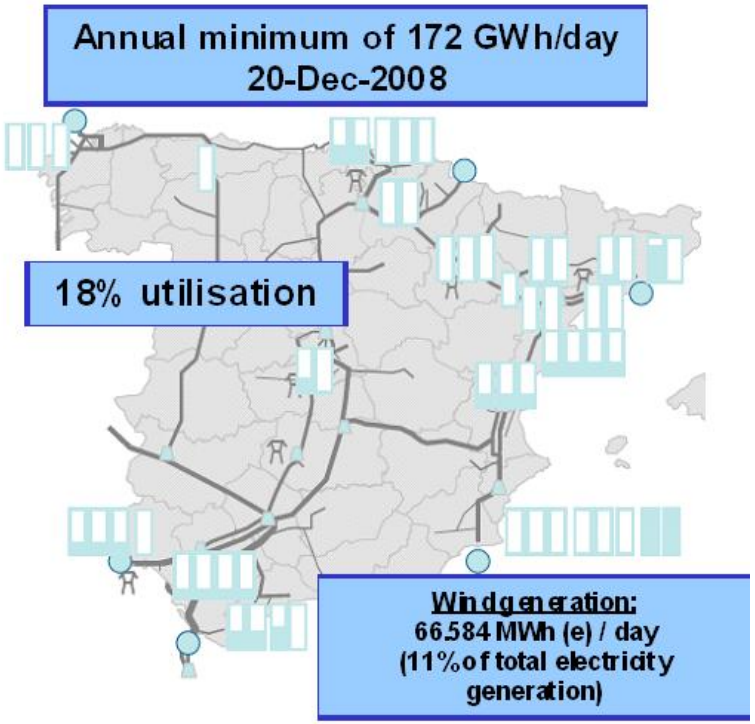
Source: IEA, NGMR 09

The future role of gas in the power generation mix could evolve

Summer:
Less wind availability
Gas is used to replace wind



Winter:
Increased wind availability
Use of gas is minimum



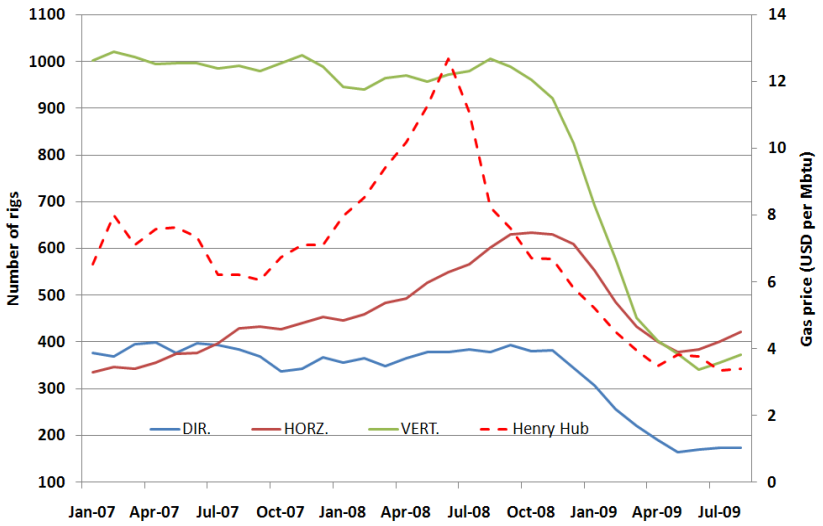
Source: Enagas

Gas supply highlights

- **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 set to decline in most other European countries**

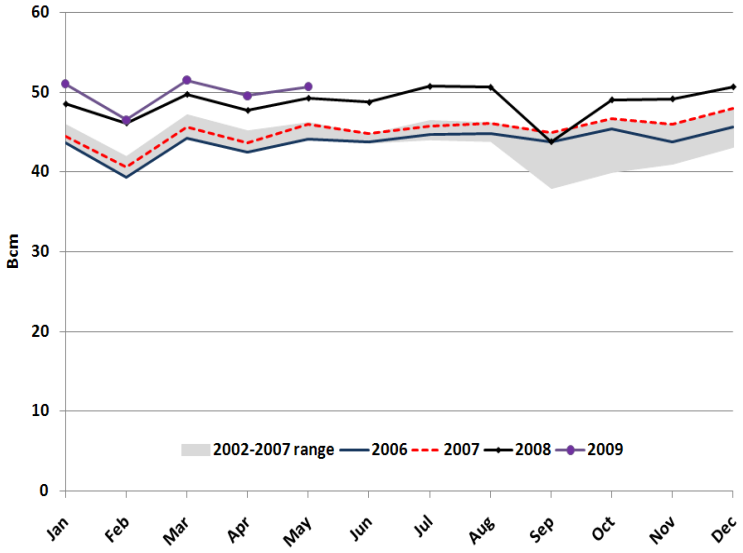
2009's wild card on the supply side
US unconventional gas production

Number of rigs vs. HH prices



Source: IEA, Baker Hughes

US gas production

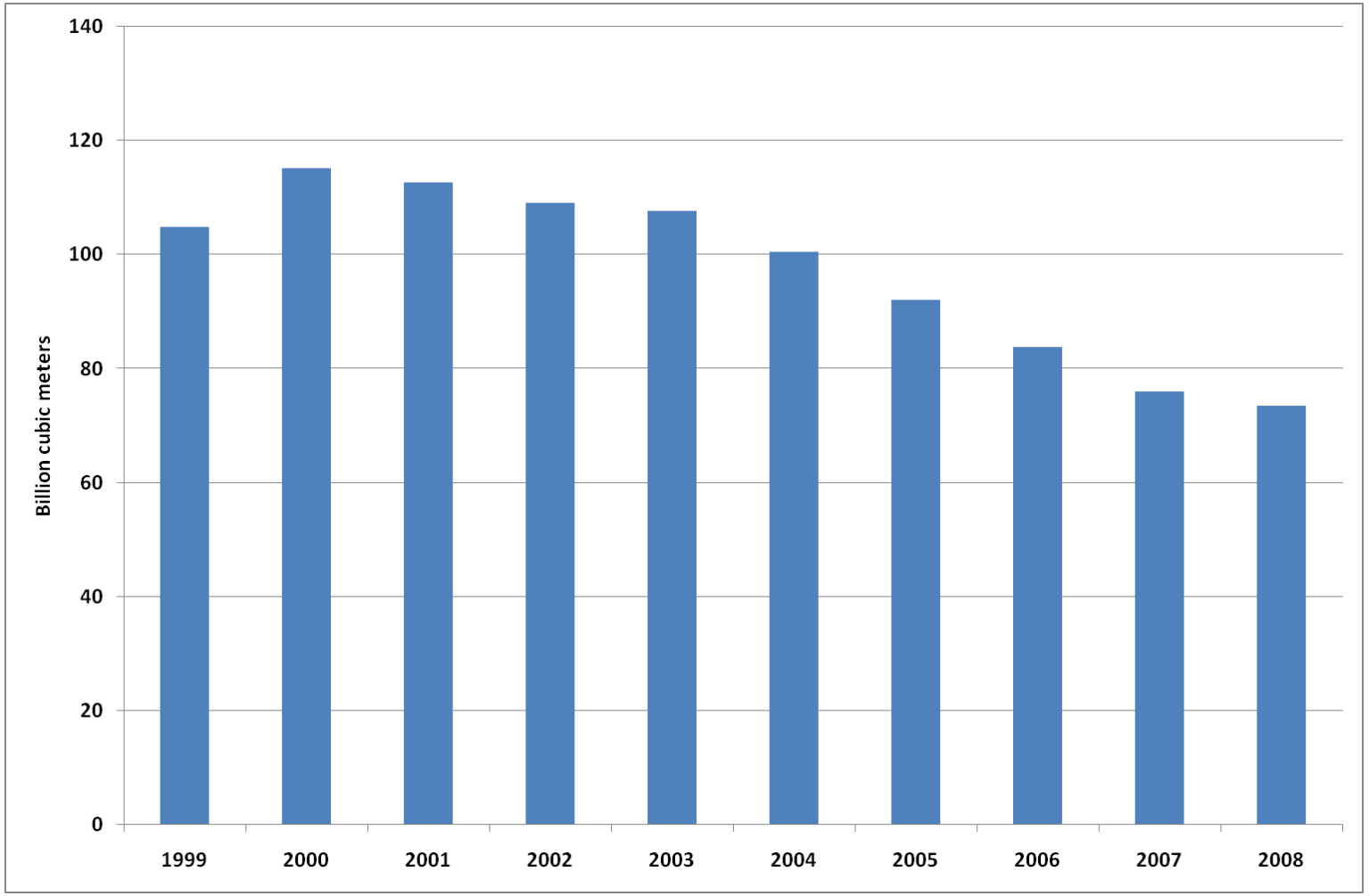


Source: IEA, EIA

Note: rigs in North America

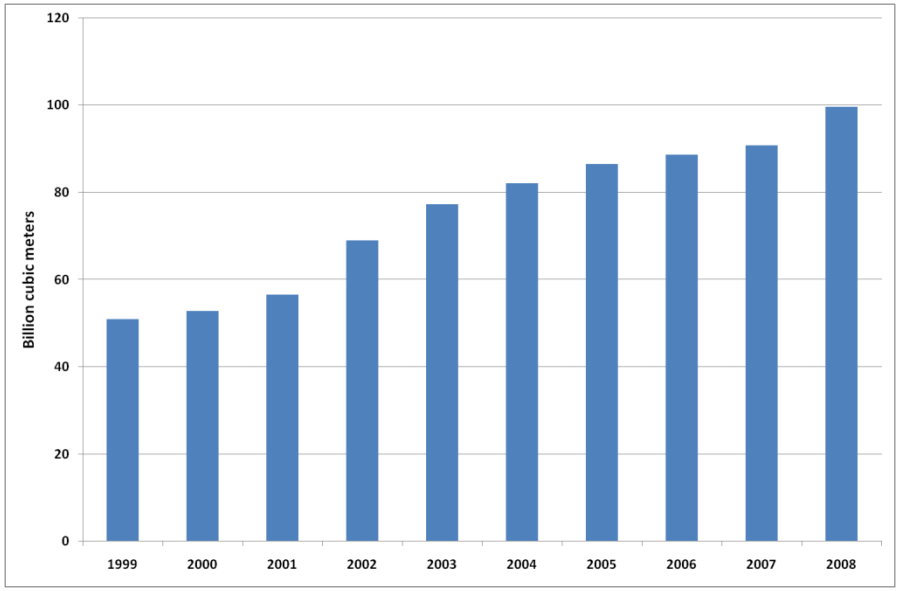
Europe production declines

UK output drops by 6% per year



Source: IEA

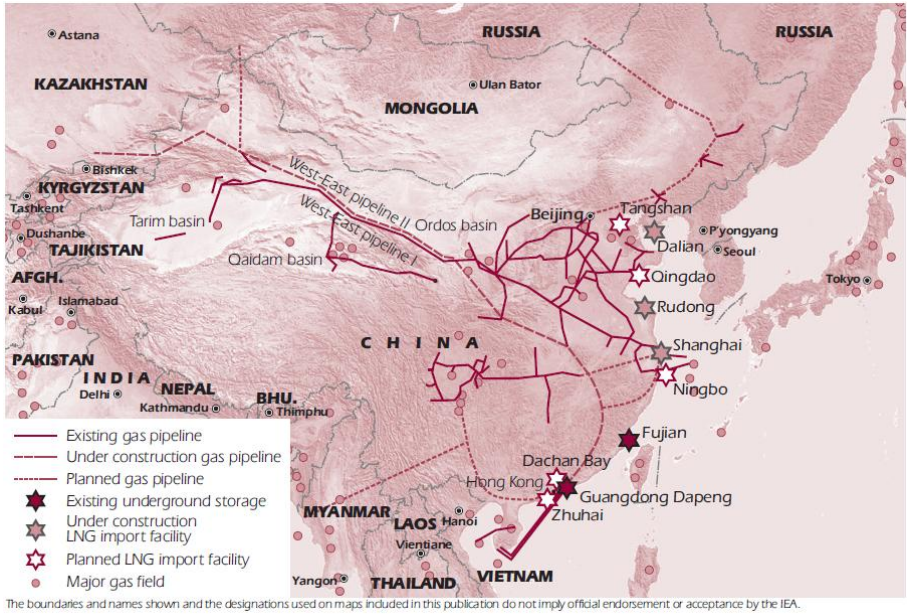
Norway – Compensating other countries' production decline



Source: IEA

- **Gas production was at 100 bcm in 2008**
  - **Set to rise to between 115 and 140 bcm within the next decade**
- **The IEA's second biggest gas exporter**
  - **93 bcm by pipeline in 2008**
- **Ormen Lange and Snøvhit among the latest fields' additions**
  - **New smaller fields to start in 2010-12: Gjøa, Skarv, Tyrihans**

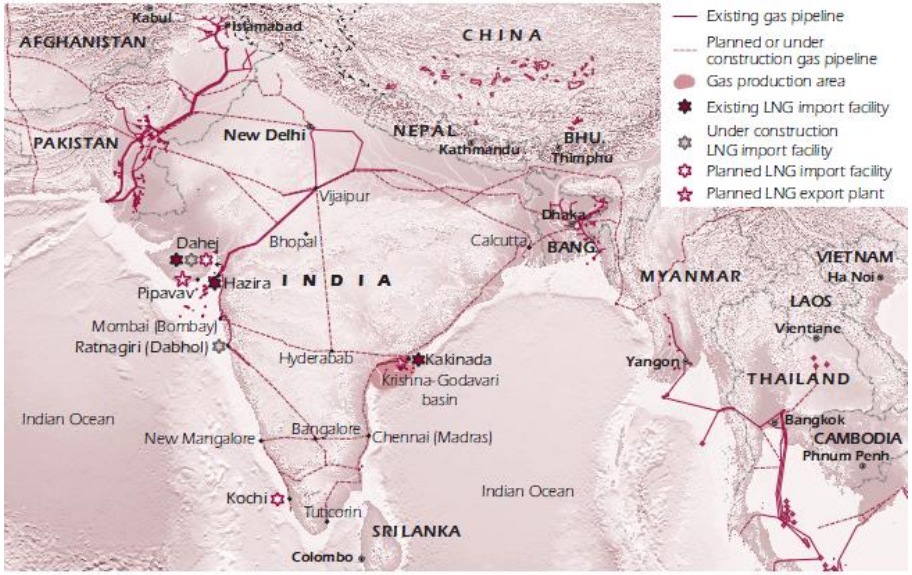
China – Already third biggest non-OECD gas user



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 total energy supply**
- **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**
  - **the first "physical link" between East Asian and Eurasian gas markets**
- **Ambitious targets for production**

India – Demand could double without supply constraints



*The boundaries and names shown and the designations used on maps included in this publication do not imply official endorsement or acceptance by the IEA.

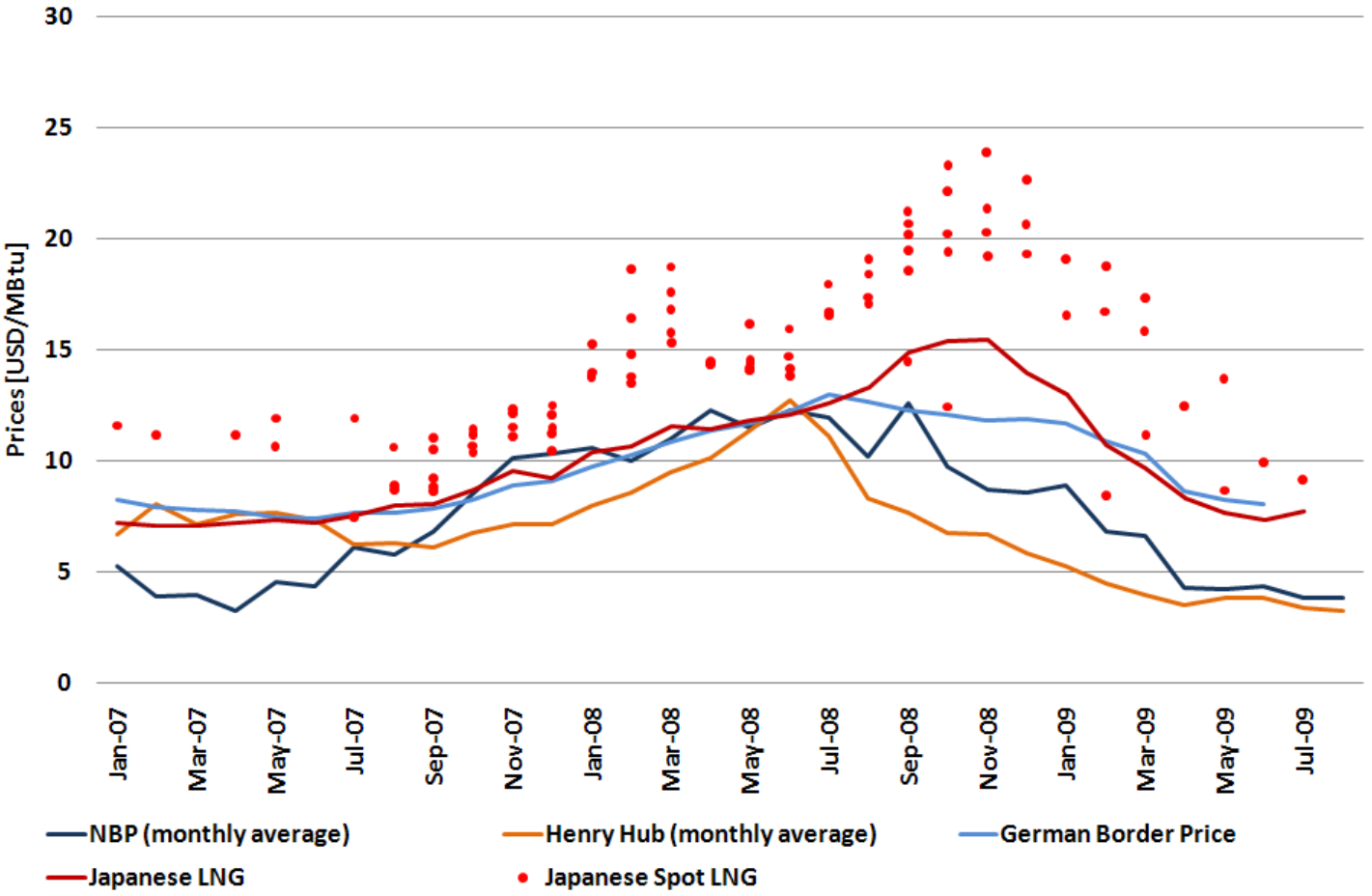
Source: IEA, NGMR 09

- **Gas plays a small part in India's energy needs**
  - **barely 5% of total primary energy supply.**
- **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**

Gas price environment

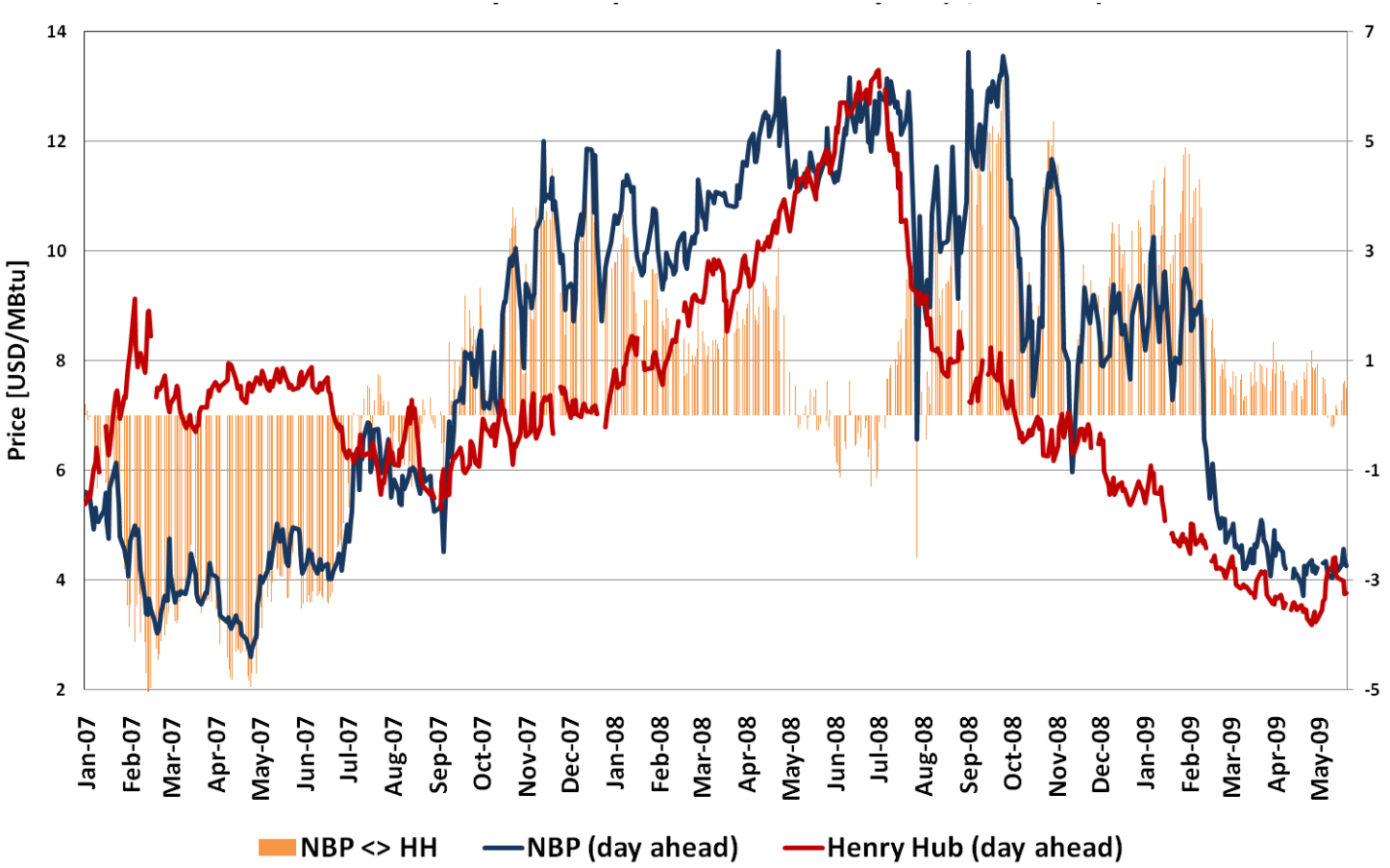
- **NBP and HH gas prices fell from USD 13-14 per MBtu in mid-2008, to at or below USD 4 per MBtu mid 2009, to $2.5 a week ago**
- **Oil-linked gas prices in Continental Europe and Japan have been declining more slowly**
  - **They are expected to fall to around USD 6-7 per Mbtu during summer 2009**
  - **This makes LNG spot cargoes more interesting than pipeline 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 are declining
How long can spot prices stay that low?



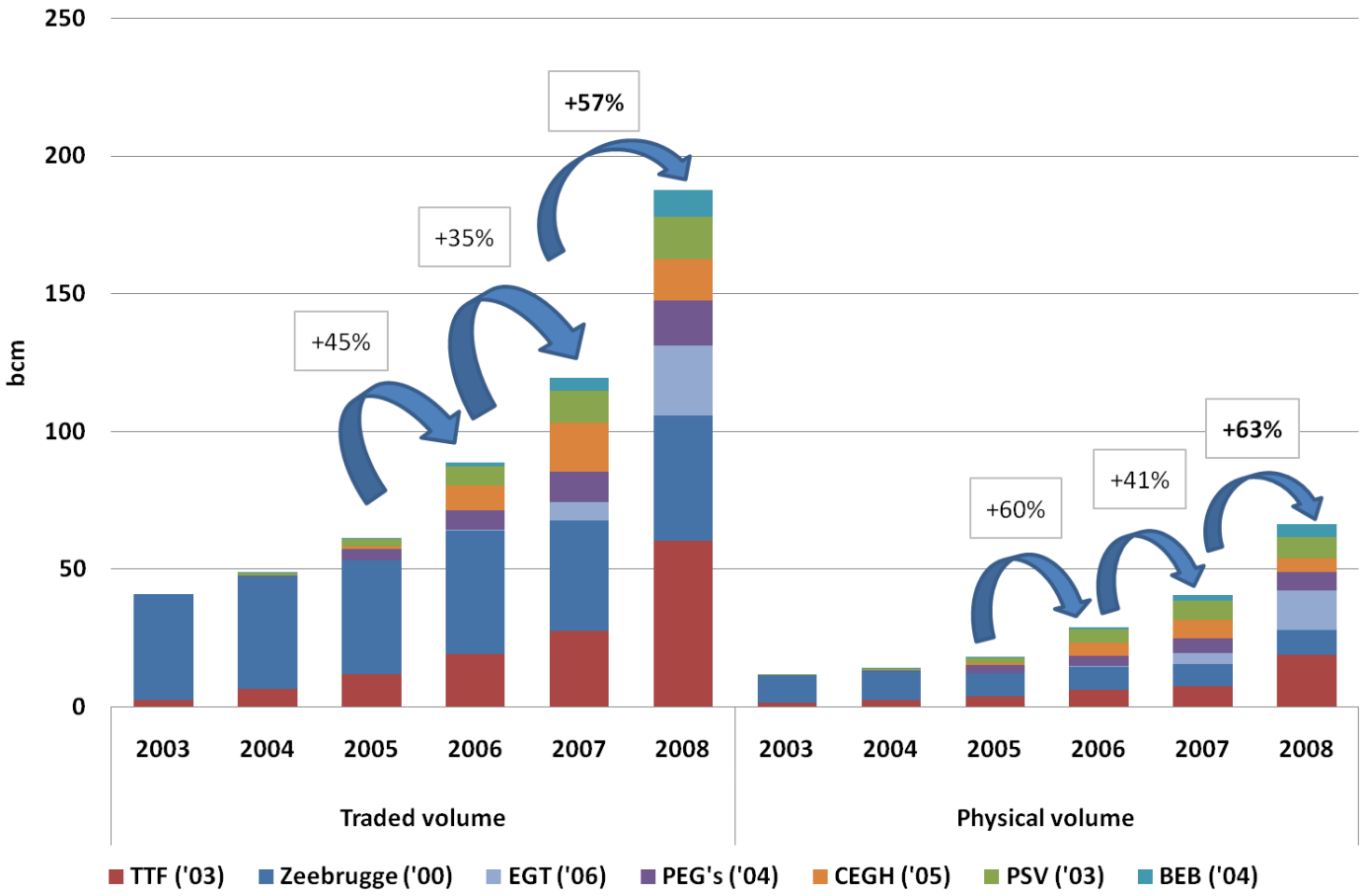
Source: Bundesamt für Wirtschaft und Ausfuhrkontrolle (BAFA), ICIS Heren, ICE, Trade Statistics of Japan (Ministry of Finance), European Central Bank, Federal Reserve.

Spot prices are converging



Source: ICIS Heren, ICE, European Central Bank, Federal Reserve.

Liquidity is growing on Continental spot markets



Source: Gas Transport Services, Huberator, GRTgaz, TIGF, CEGH, E.ON Gas Transport, Snam, Gasunie Deutschland.

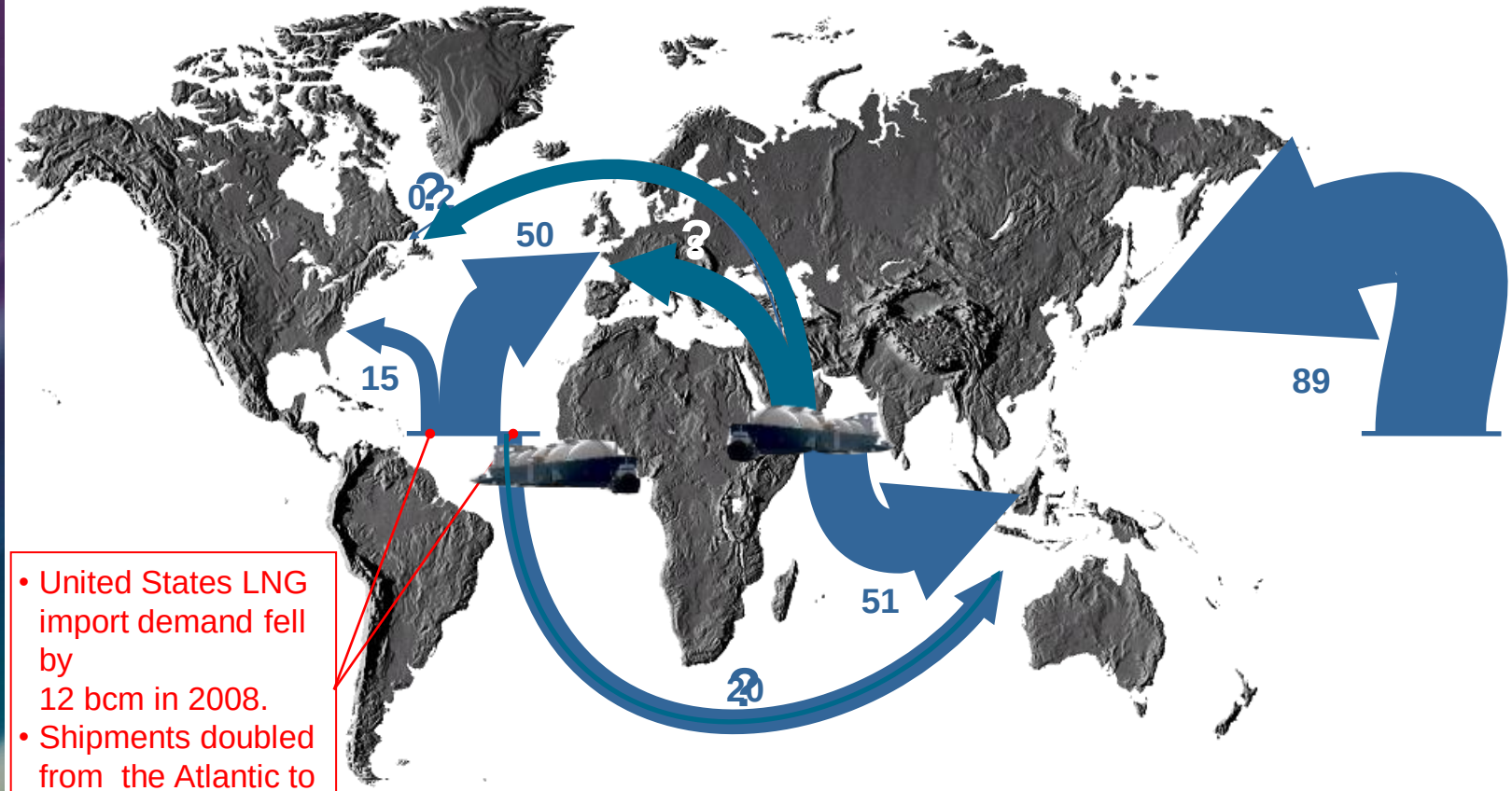
LNG Markets
What happened in 2008

- **Strong growth during the first half of the year**
- **Little growth of trade**
  - **Only two liquefaction projects started**
  - **Many force majeure problems**
    - **Arzew**
    - **Nigeria**
- **Movements of cargoes from the Atlantic to the Pacific basin**
  - **Reduction of imports from the US**
- **First imports from South America**
  - **Argentina**

LNG Markets
2009

- **Asian demand has been declining substantially**
  - **Japan demand down by 6 to 10% during the fist quarter**
- **More LNG available for the Atlantic basin**
  - **Demand still limited in the US**
  - **Most is going to Europe at NBP/HH prices: European buyers have been decreasing their take of pipeline gas at oil-linked gas prices**
- **Big uncertainty for the second half of the year**
  - **By how much will US production decline?**
  - **What will be European demand as buyers need to respect minimum ACQ?**

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)

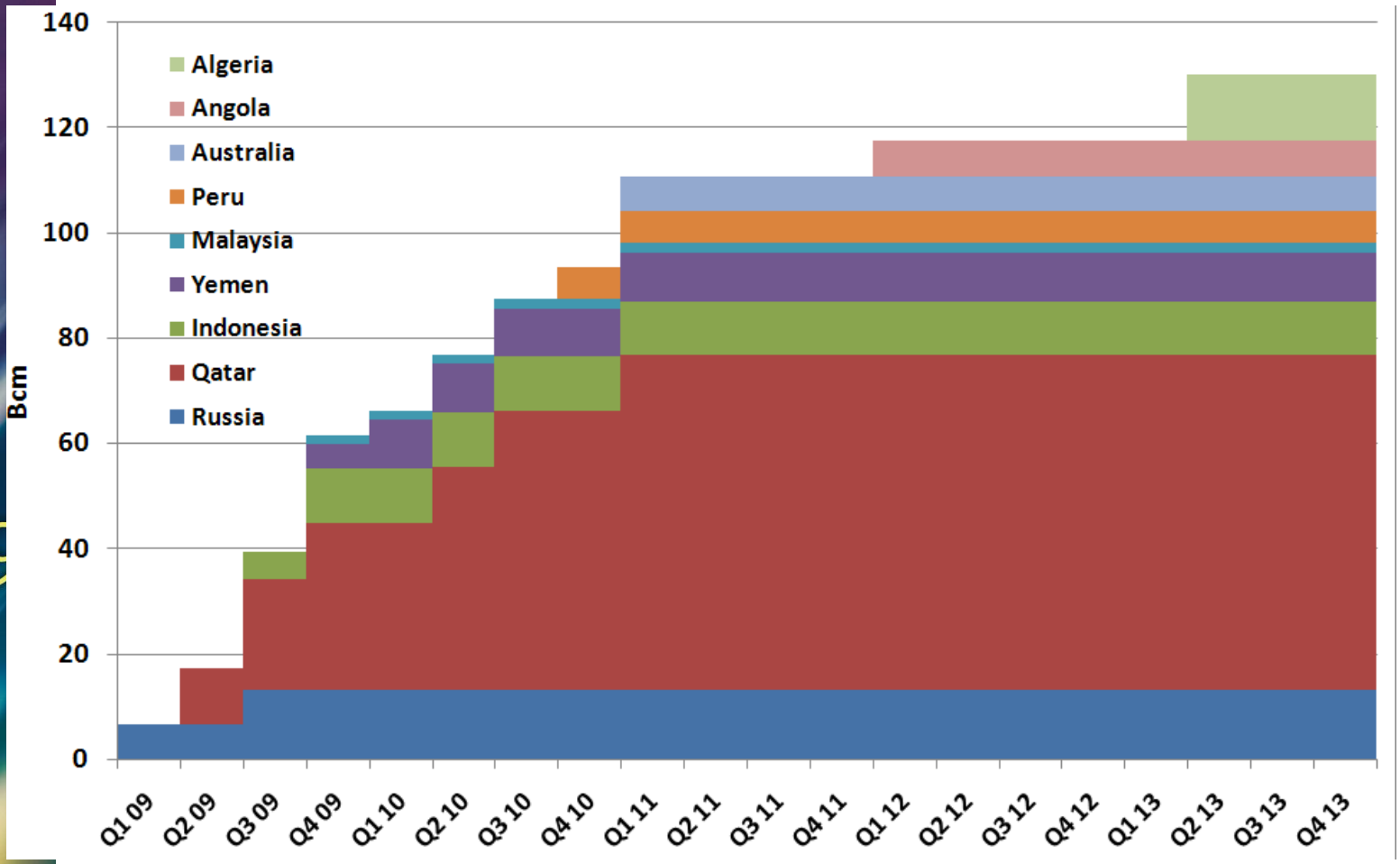
from / to	Pacific	Middle East	Atlantic	**total**	share
Asia	89	51	20	**160**	68%
Europe	-	8	50	**59**	25%
Americas	-	0.2	15	**15**	7%
total	**89**	**60**	**85**	**234**	
share	38%	26%	36%		

LNG Business Outlook
2009-13

- **Liquefaction will grow from 280 bcm to 410 bcm**
  - **There might be some slippage in decommissioning dates as it has been observed over the past years**
  - **Producers may react to demand weakness by postponing start-up of plants**
  - **Production to reach maximum probably only by 2014-15**
- **Regasification capacity to increase from 640 bcm to 880 bcm**
  - **Based on capacity under construction**
  - **Regasification capacity grows**

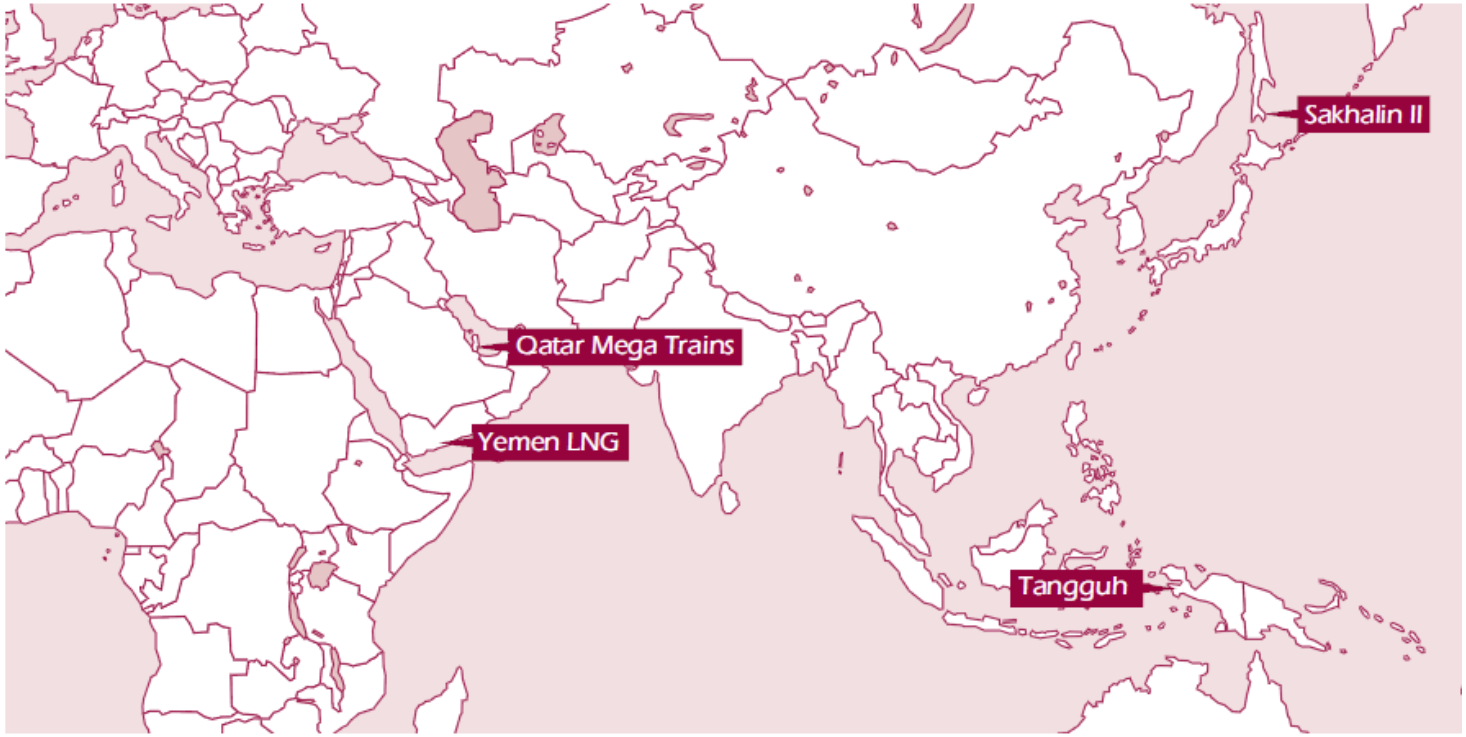
Significant expansion of LNG capacity

But many delays or technical difficulties



Source: IEA, NGMR 09

New Liquefaction projects starting in 2009



The boundaries and names shown and the designations used on maps included in this publication do not imply official endorsement or acceptance by the IEA.

Source: IEA, NGMR 09

Liquefaction key questions

- **When will the next generation arrive?**
  - **Very few FID taken over the past 3 years**
  - **A few projects are expecting to take FID this year and next**
- **What is the potential of slippage of projects under construction?**

Liquefaction developments
What comes post 2013?

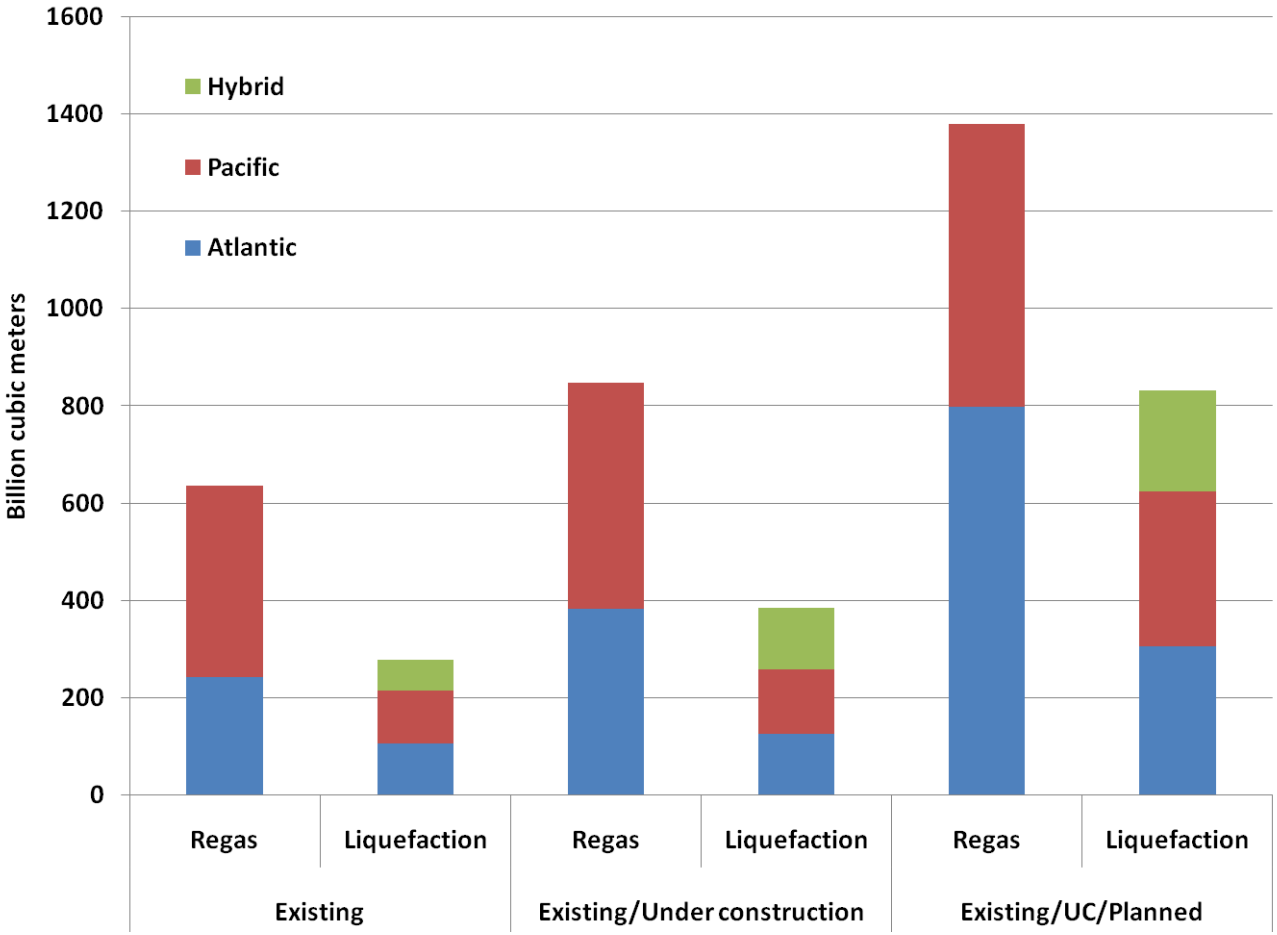
- **Only five projects have advanced to FIDs since mid-2005**
- **Liquefaction projects have been affected by**
  - **Project delays due to skilled labour shortages**
  - **Higher material and engineering costs**
  - **Market uncertainty**
- **EPC prices may come down somewhat, but more reductions are expected**

- **A few projects to look at:**
  - **PNG LNG, Papua New Guinea**
  - **Donggi-Senoro LNG, Indonesia**
  - **Ichtys, Gorgon, CBM-to-LNG projects, Australia**
  - **Brass LNG, Nigeria LNG Train 7, Nigeria**
  - **Shtokman, Russia**

Regasification – major highlights

- **New regasification capacity under construction rebalancing the share towards the Atlantic basin**
- **A third of the new regasification capacity expected by end 2010 will be in the US**
  - **might be relatively underutilized in the short-term – or start operating later**
- **Regasification surcapacity will continue**
  - **It encourages short-term and spot trade**
- **Capacity planned has the potential to double both the liquefaction and the regasification capacity**

Liquefaction vs Regasification



Source: IEA, NGMR 09

Investing in a world of uncertainties

- **Uncertainties about future regional demand and import requirements**
  - **Move towards more energy-efficient, less CO_2 emitting energy sources**
  - **Competition from domestic markets**
- **Uncertainties about the development of upstream resources in the world**
  - **Supply and demand developments in both neighbouring and distant markets will increasingly matter for import-dependent countries**
- **Regulatory uncertainties**

These uncertainties existed before

Since 2008, new uncertainties have appeared

- **Financial uncertainties**

The investment challenge

- **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 recover quickly**
  - **Investments on the supply side are however constrained by long lead times**

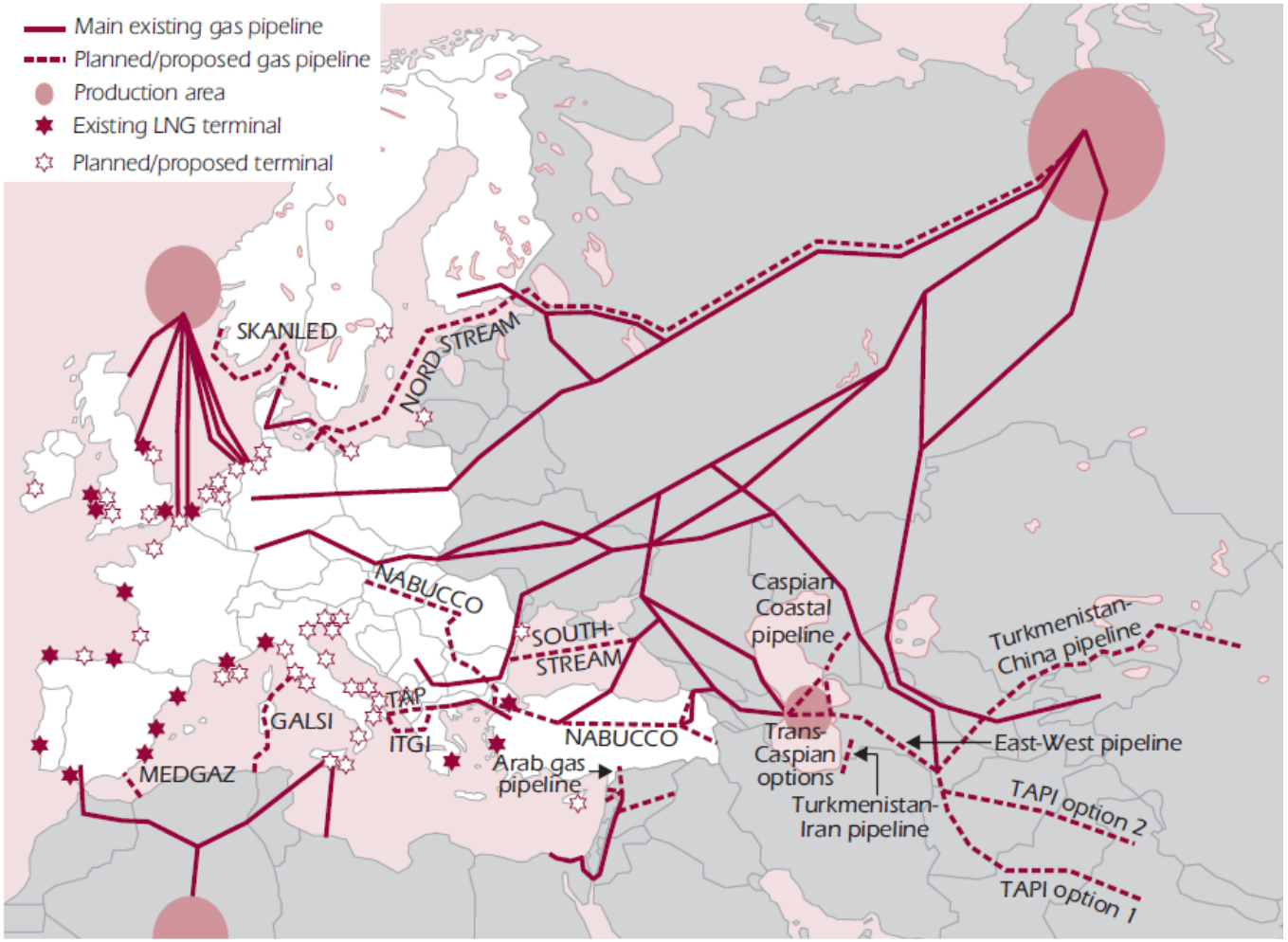
Investment in producing regions

- **The slow pace of upstream gas development was already a concern**
  - **Prior to the current 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.**

A lot of infrastructure planned to supply Europe

NATURAL GAS MARKET REVIEW

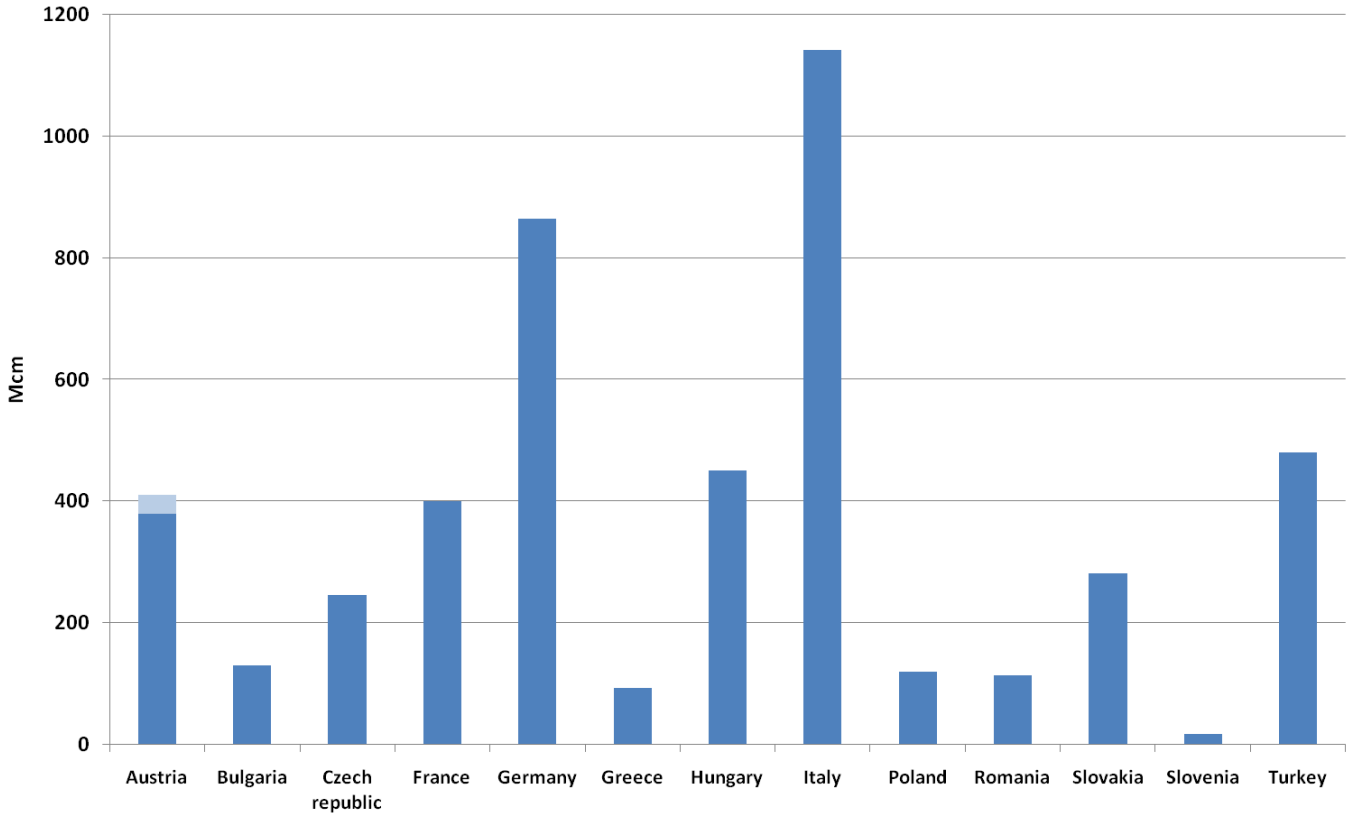
2009



The boundaries and names shown and the designations used on maps included in this publication do not imply official endorsement or acceptance by the IEA.

Source: IEA, NGMR 09

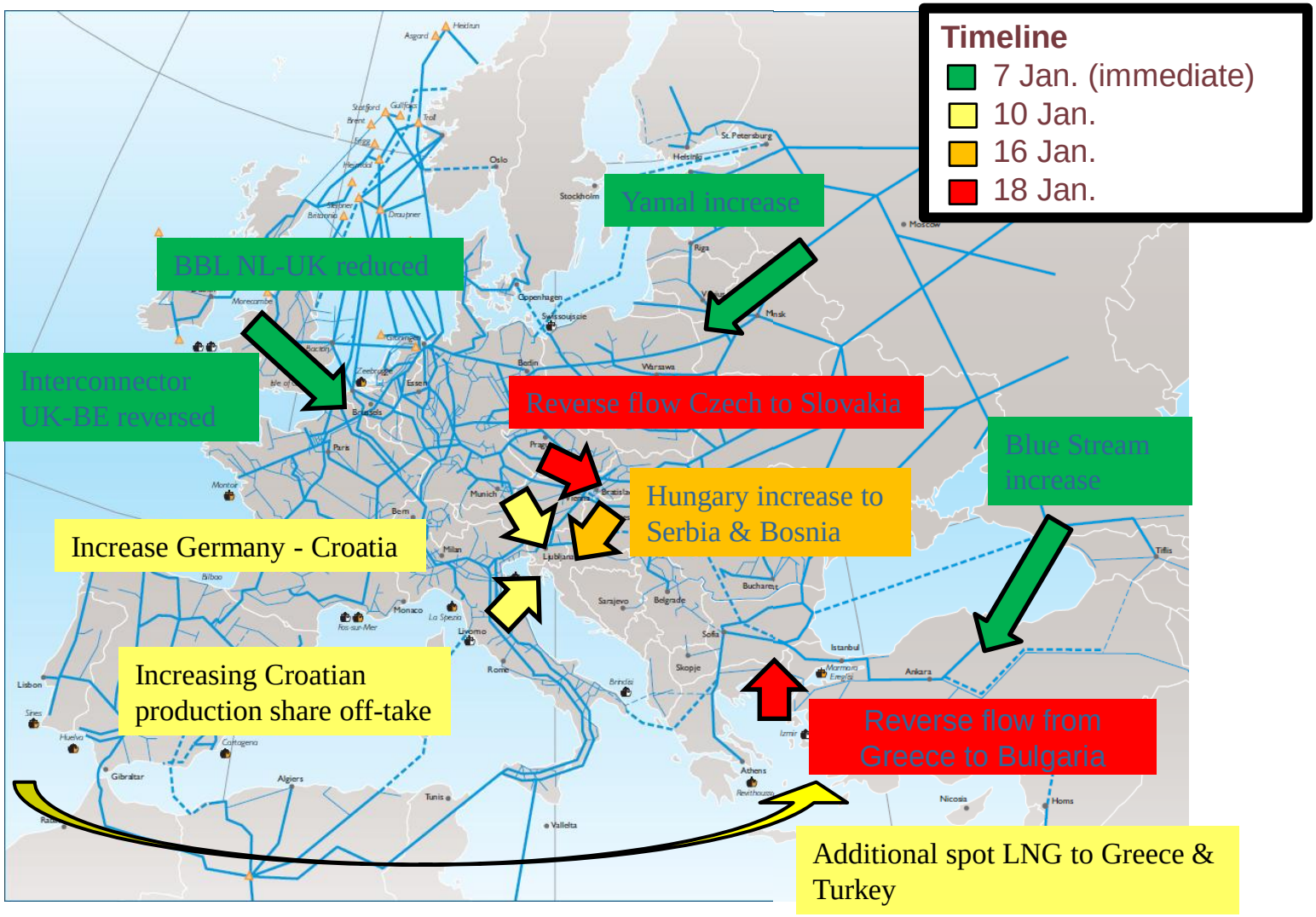
Missing Russian volumes amounted to 5 bcm



Source: IEA, NGMR 09

Note: Austria estimated

European responses to the gas dispute between Russia and Ukraine



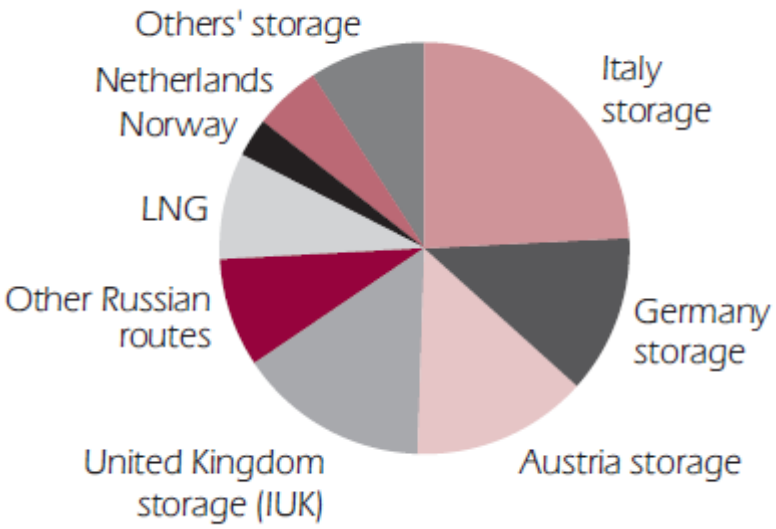
Source: IEA, NGMR 09

Different responses from the supply side

	Austria	Bulgaria	Czech Republic	France	Germany	Greece	Hungary	Italy	Poland	Slovakia	Slovenia	Turkey
Alternative Russian supplies	✓	X	✓	X	✓	X	X	X	✓	X	X	✓
Supplies (increase existing)	✓	X	✓	✓	✓	✓	X	X	X	X	✓	✓
Supplies (reverse flow)	X	✓	X	X	X	X	X	X	X	✓	X	X
LNG	X	X	X	✓	X	✓	X	X	X	X	X	✓
Domestic production	X	X	X	X	X	X	✓	X	X	X	X	X
Storage	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	X	✓

Source: IEA, NGMR 09

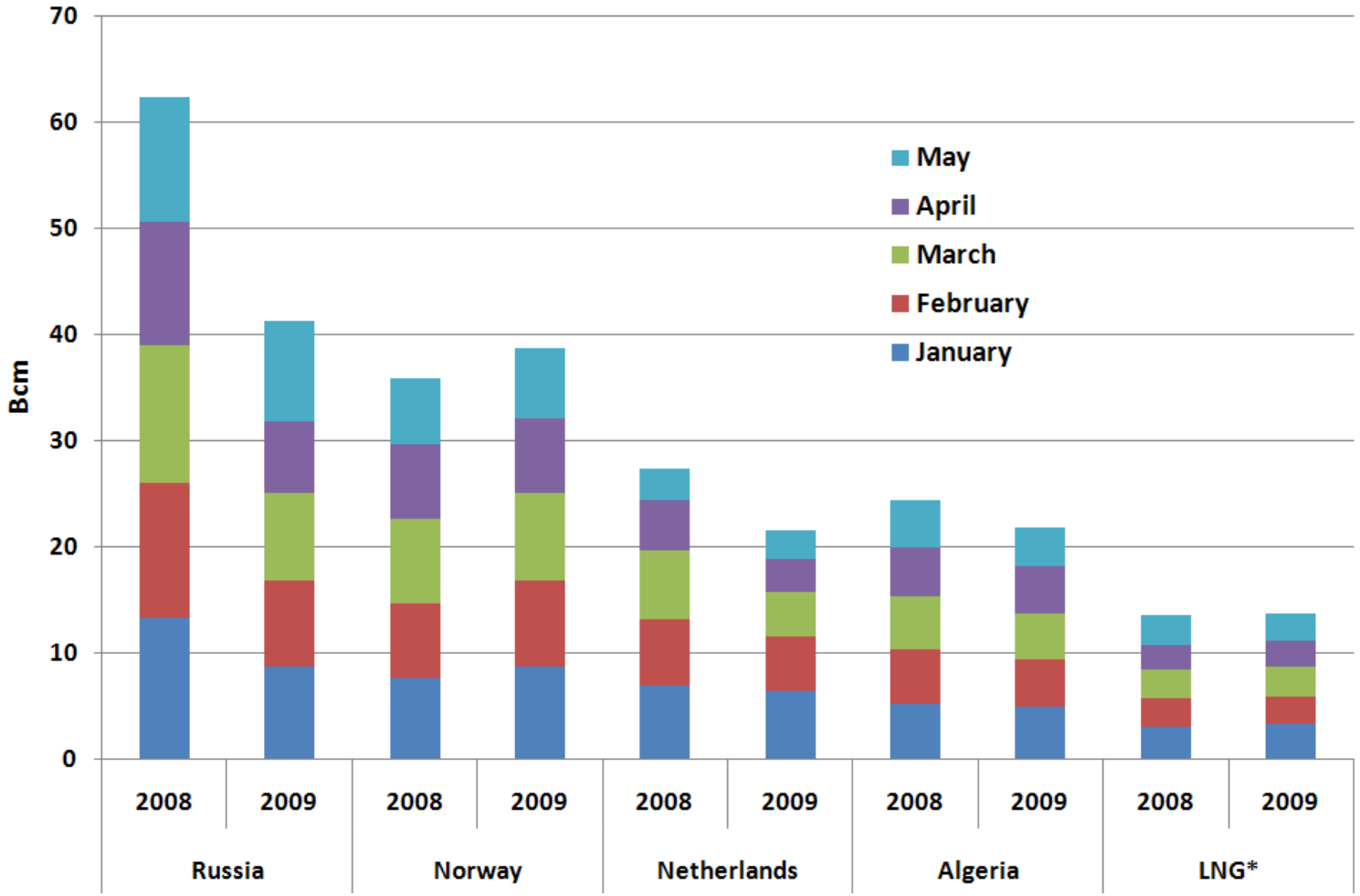
How Europe faced the supply disruptions



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**

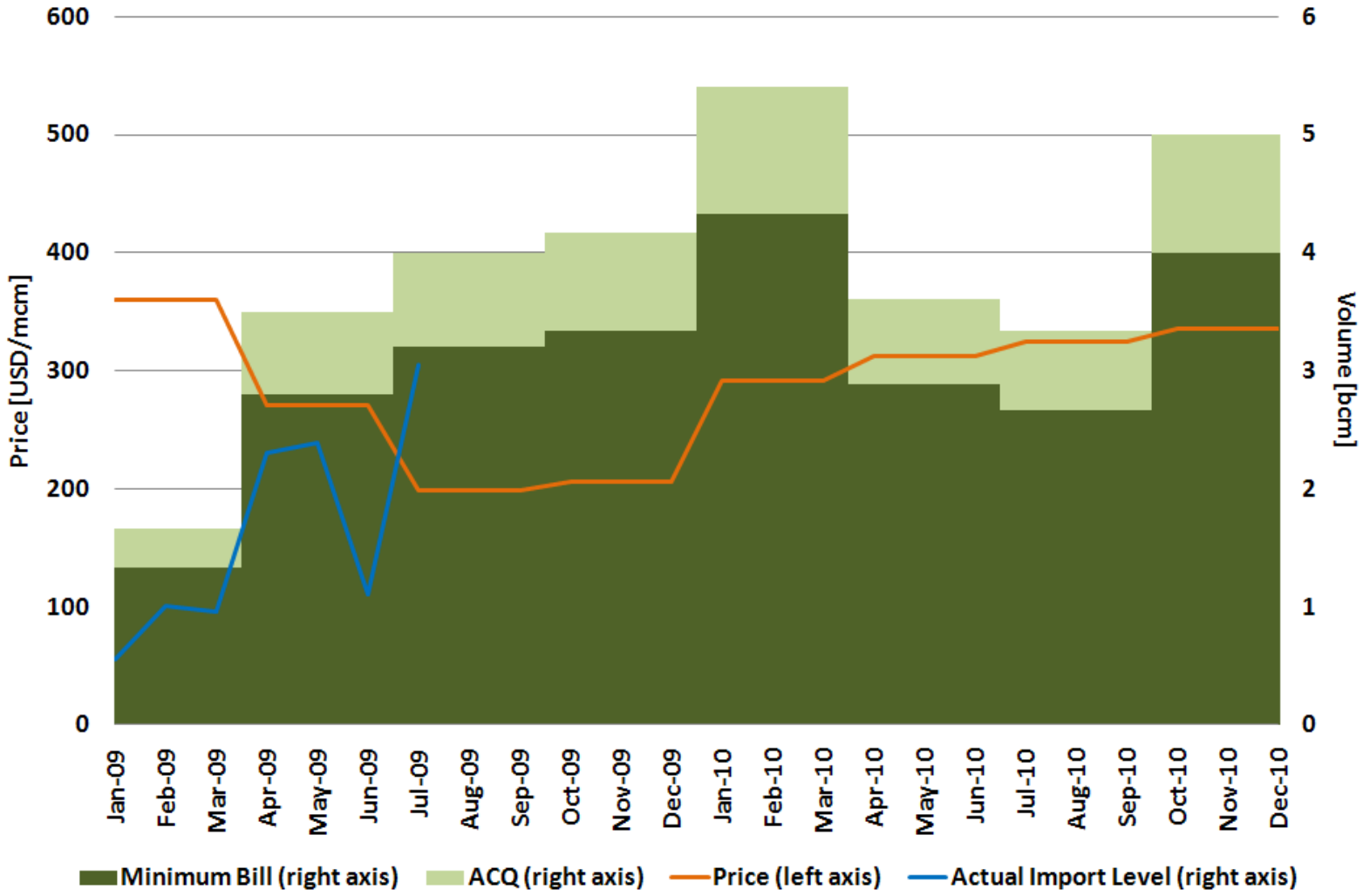
OECD European Imports
Lower demand has affected suppliers unequally



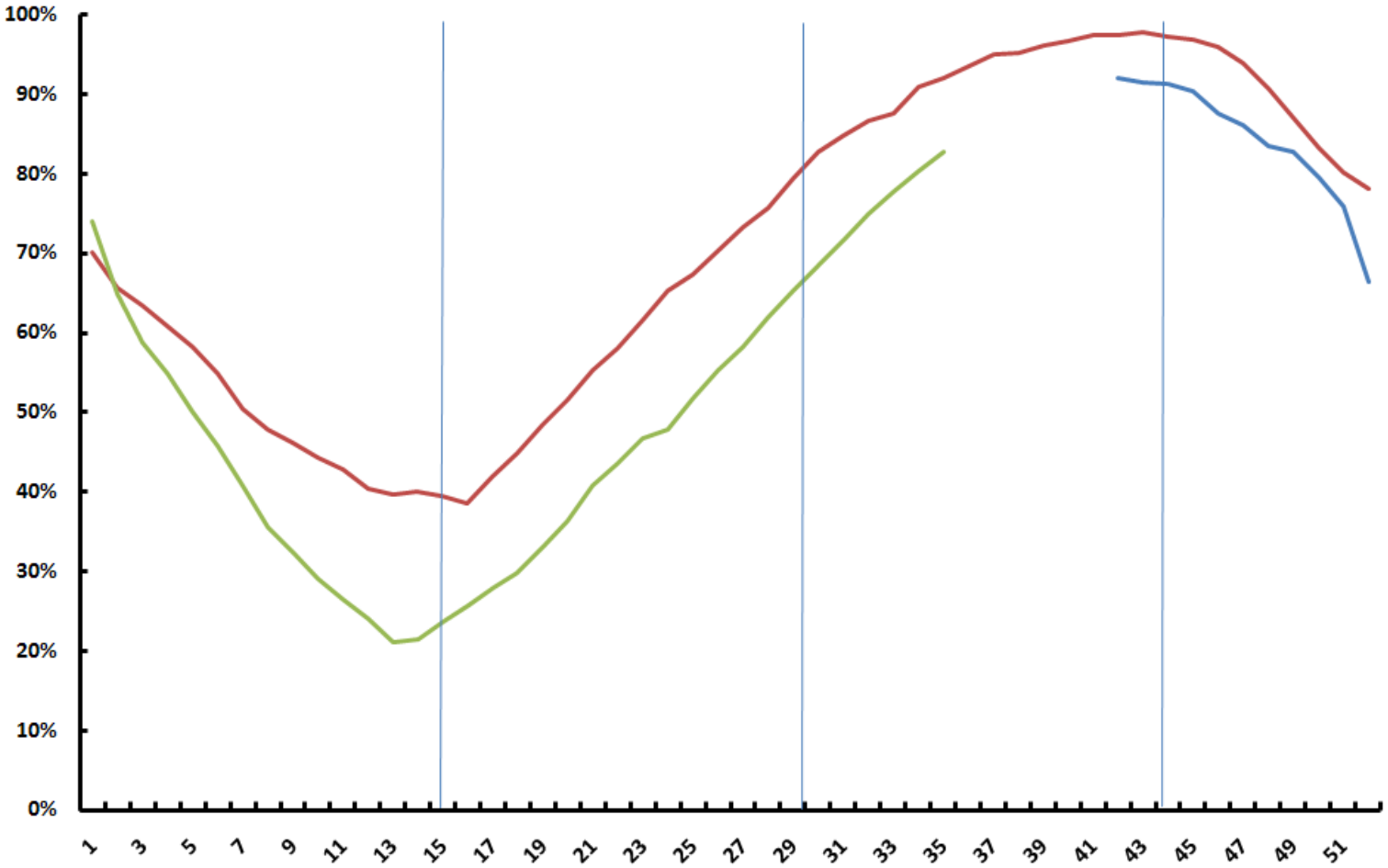
LNG: T&T, Qatar, Oman, Nigeria, Egypt

Ukraine is paying for gas imports

But imports are well below contract levels



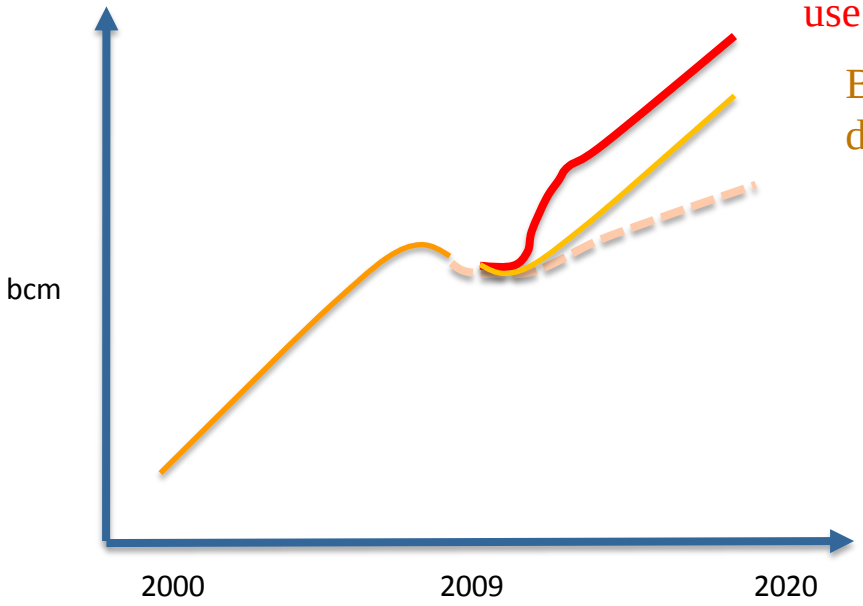
European* storage filling rates



Source: GSE, excluding strategic storage
Note: This does not represent total European storage capacity, but capacity covered by GSE which increased from 52.8 bcm in January 2009 to 67.1 Bcm as of September.

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

Thank you for your attention