

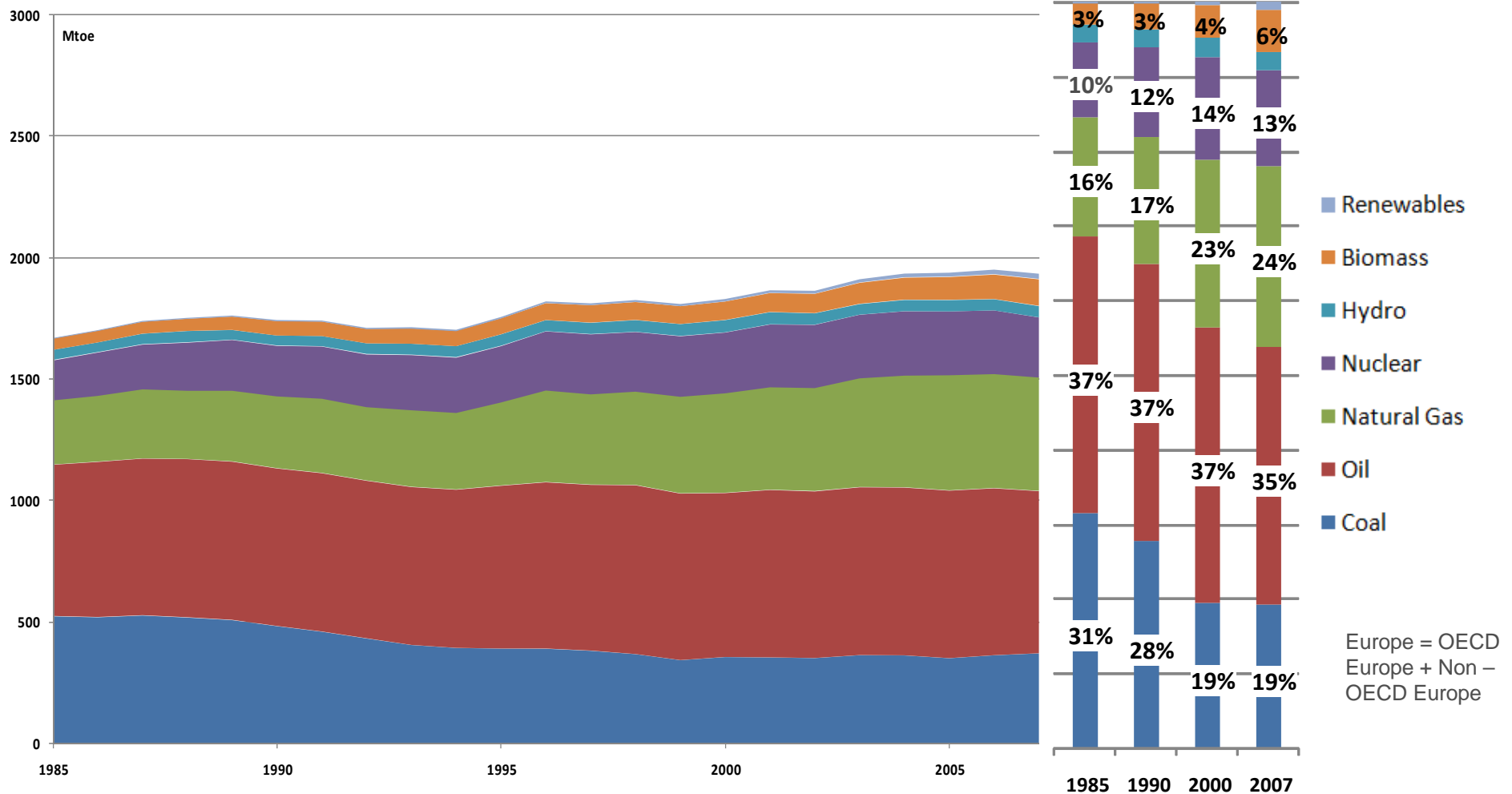
How will the Crisis Affect Natural Gas Supply and Demand?

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TOTAL

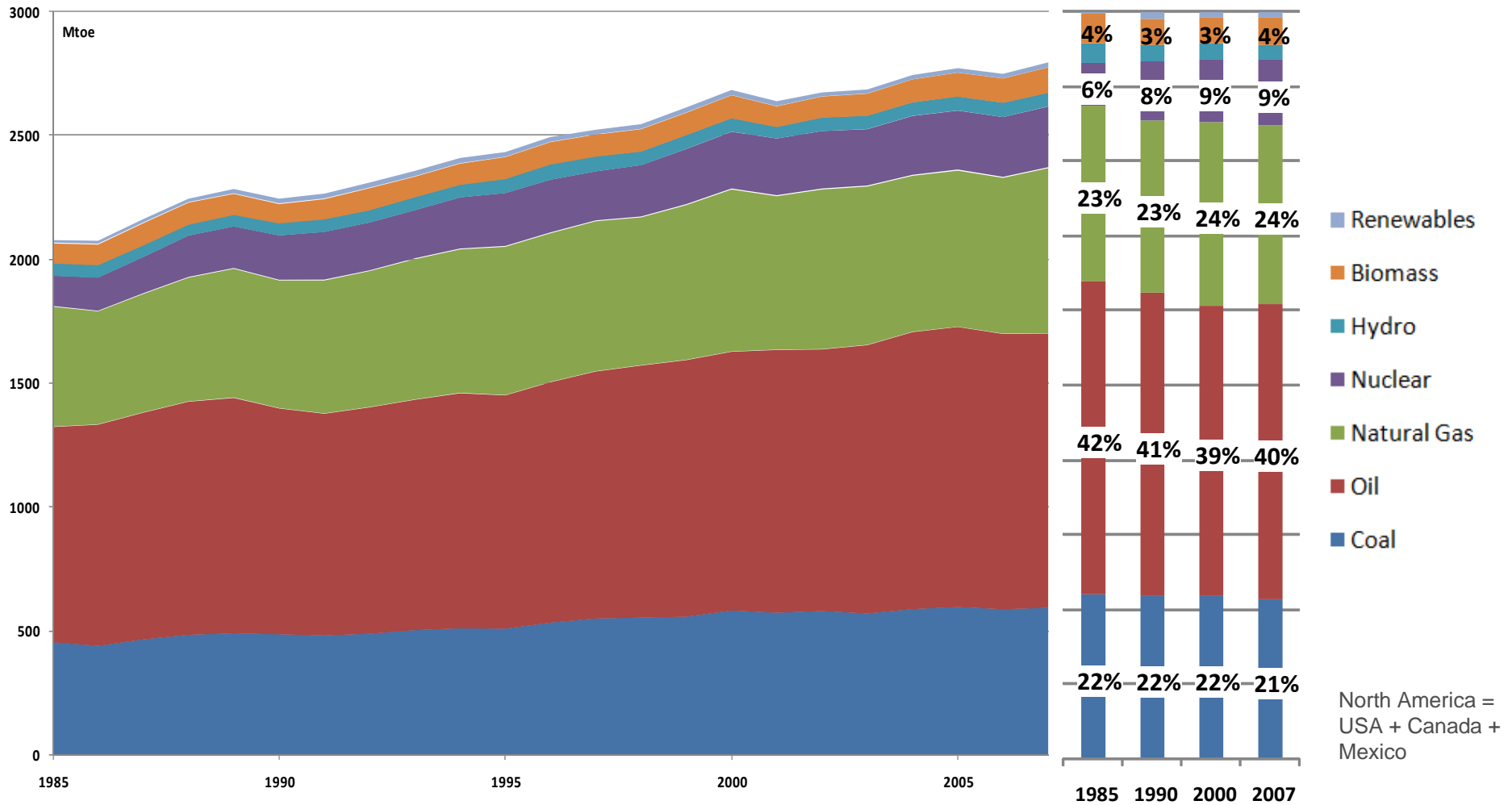
Context before crisis and LT demand trend (1): Europe Energy Mix



Gas consumption increased by oil - and coal - to - gas substitution for environmental reasons

- **Until 2005: residential and industrial sectors**
- **After 2005: power generation sector**

Context before crisis and LT demand trend (2): North America Energy Mix

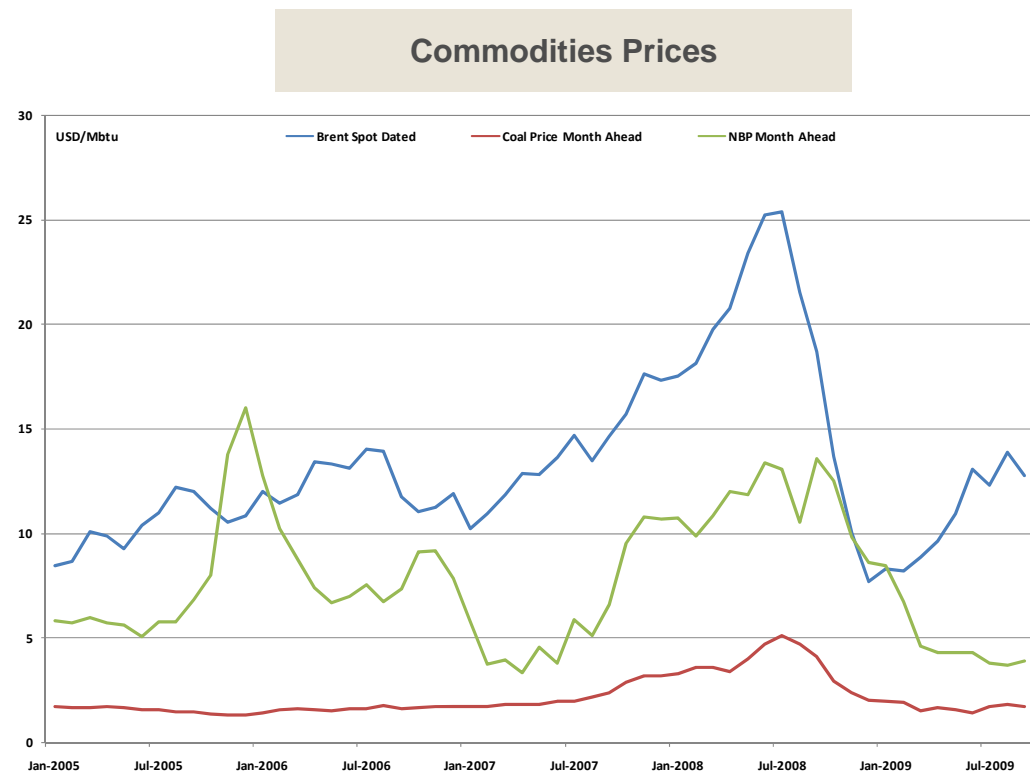


- Large CCGT generation capacity increase creates a potential for gas demand increase
- Environmental constraints to support additional gas consumption in the future

Economic Downturn since mid 2008



Source: IMF



Source: Platts, ESGM

- Industrial activity reduced strongly from Q4 2008 to Q2 2009
- Deteriorated situation had a massive impact on prices and volatility
- All commodities have not been affected to the same extent in terms of price and consumption

Impact of crisis on natural gas supply / demand balance

► Demand

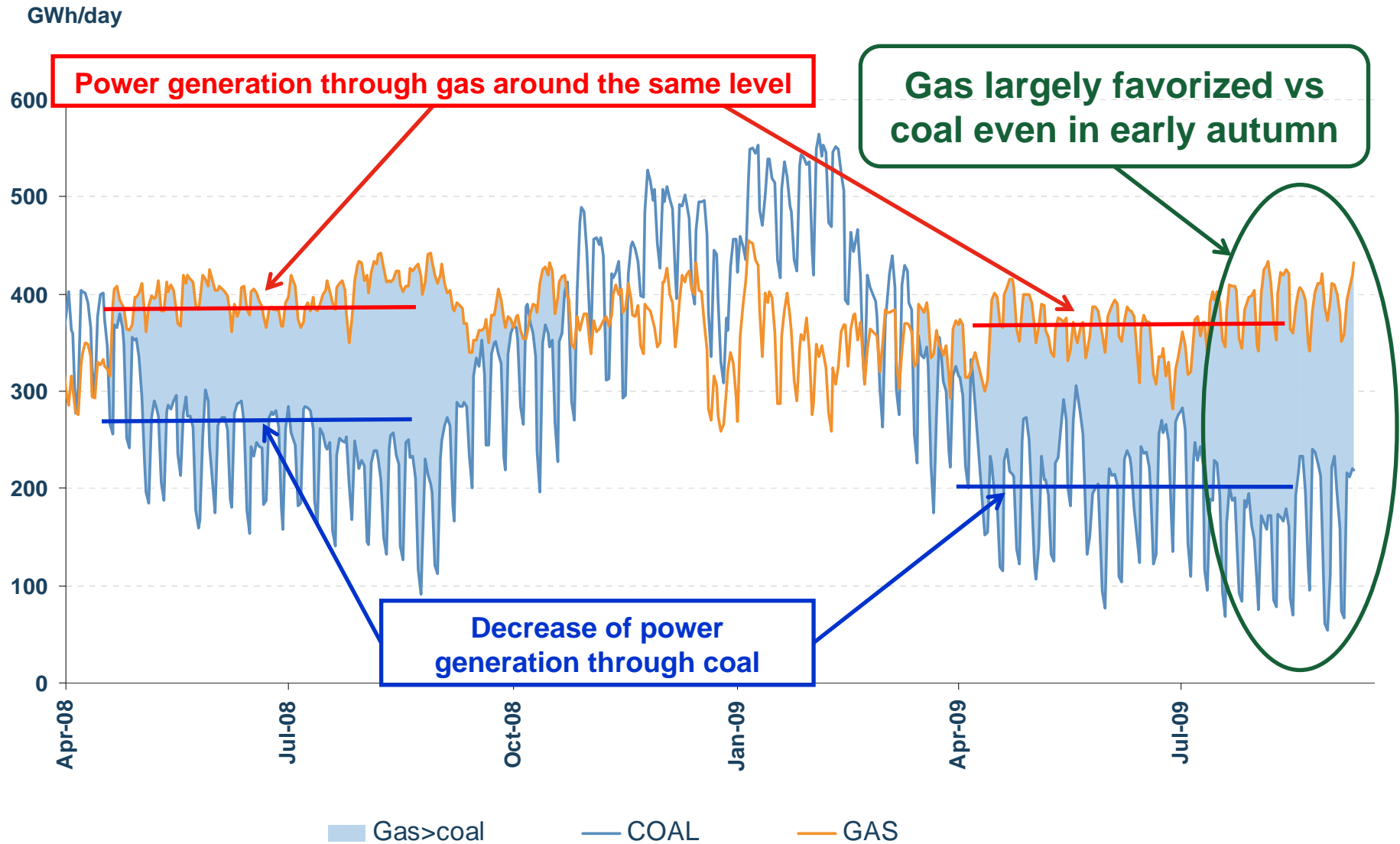
- Residential consumption mostly linked to weather conditions, therefore barely impacted by the crisis
- Industrial consumption strongly affected
 - Decrease of industrial output
 - Stability of energy mix due to a lack of flexibility in industrial energy consumption structure

► Supply: LNG production to increase + US domestic gas production higher than expected → spot prices ↘

- Power generation is a source of flexibility
 - Lower demand brought overcapacity in liberalized markets (UK, USA...)
 - Ability for power producers to run either coal- or gas –fired power plants
 - Flexible and accessible fuel sources
- Gas has been favored by power producers
 - Cleanest fossil fuel (impact of Large Combustion Plants Directive)
 - Installed generation capacity is providing the flexibility required in a highly volatile context (demand, prices...)

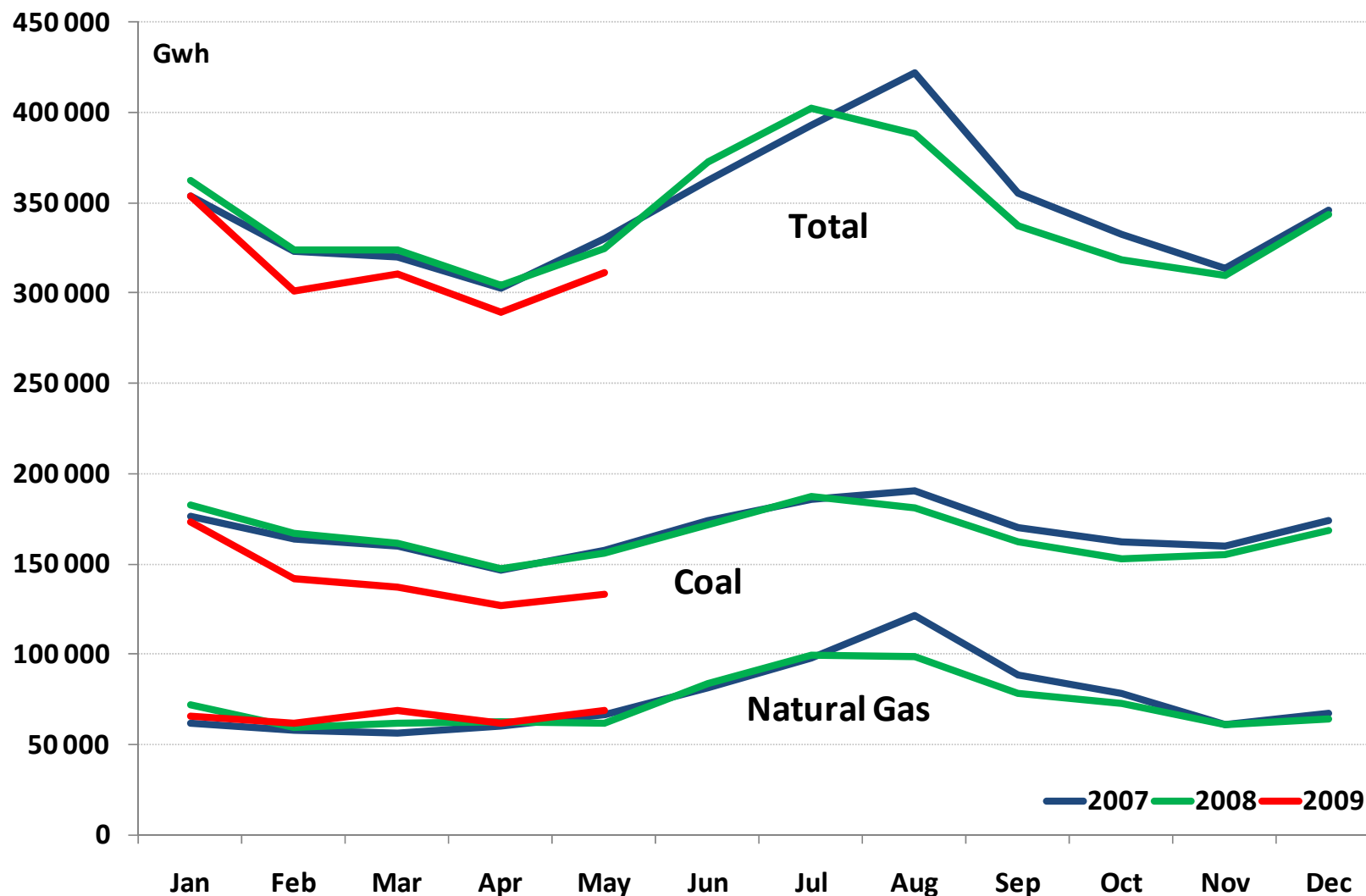
Natural gas demand has been affected by global crisis but power generation is partly compensating its effect

Situation in the UK: Switching gas/coal



Gas is favored by power producers in the UK because of price, environmental and installed capacity flexibility reasons

Focus on power generation in the US



Power generation demand decrease is not impacting gas demand, whereas coal is largely affected



Impact of the crisis on natural gas supply

▶ Economic Crisis is affecting gas supply through two main factors

- Gas and LNG depressed prices
- Credit crunch at a worldwide level

**Number of wells drilled in the USA
June 2008 – September 2009**

▶ North America

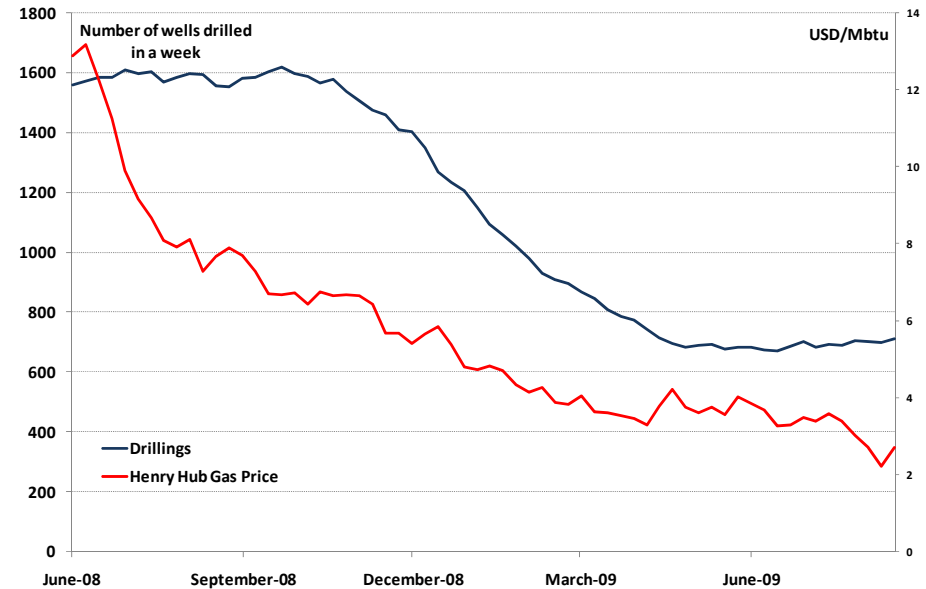
- Massive impact on drilling activity
 - Prices and Credit crunch
 - Minus 50 % from June 2008 to August 2009
- Production recently started to decline

▶ Russia

- European buyers are limiting pipeline import quantities
- Russian production has decreased by around 20% (H1 2009 vs H1 2008)
- Gazprom is accordingly delaying large investments in a difficult economic context

▶ LNG plants will continue to produce

- Projects launched before costs hike are profitable
- Variable costs are low
- Additional revenue of liquids



Source: Smith

Gas balance mechanism: 2010 - 2012

Potential contractual oversupply

- Economic crisis: negative impact on gas demand for industry
- Supply: increase of contractual supplies (LNG + Pipeline)

TOTAL ~ Potential Oversupply of 180 Bcm



**Gas Price
NBP / HH**

L T Contracts / US production
Vs
Spot Supplies

Gas Vs Coal

Gas Supply

- Contractual flexibilities (ToP) Europe: - 70 Bcm
- Domestic production (US) : - 50 Bcm

Max flexibility ↘ 120 Bcm of supply

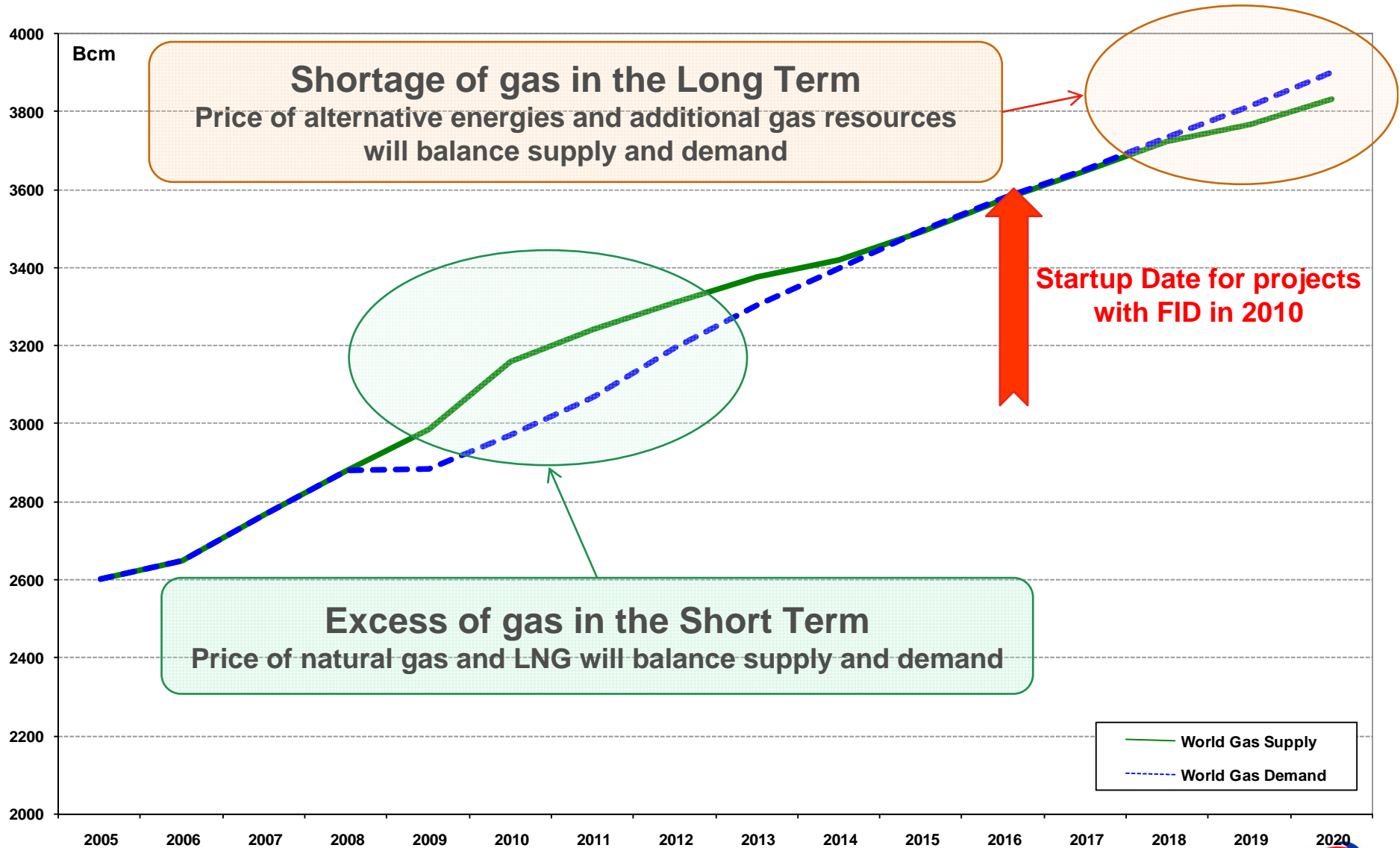
Gas Demand for Power

- Increasing Load factor of CCGT
 - Europe: + 25 Bcm
 - US: + 80 Bcm

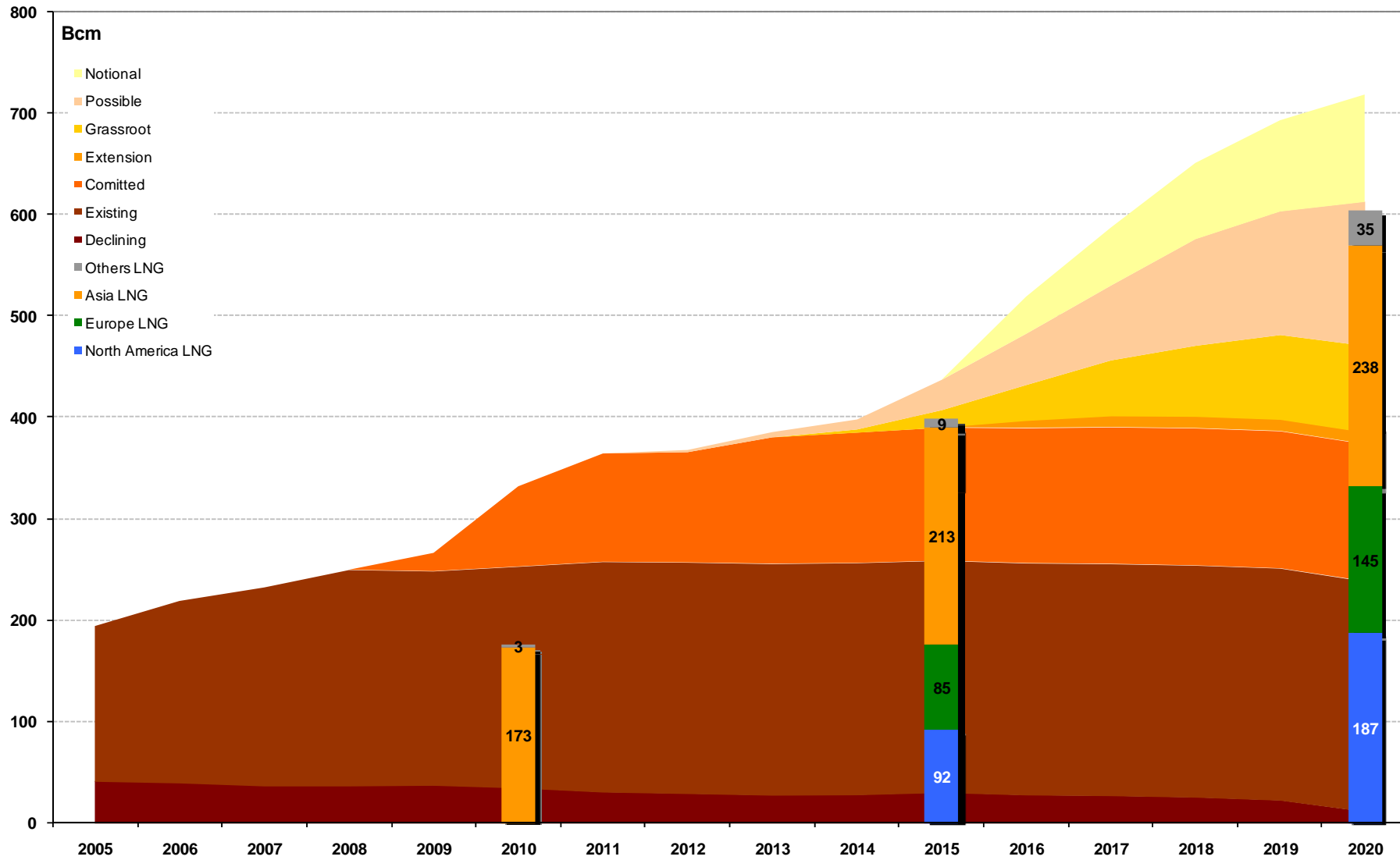
Max flexibility ↗ 105 Bcm of demand



Gas demand in the future: short & long term



LNG Balance 2005 – 2020



Investments must be kept at a high level

- ▶ **Energy Price context will be tensed after 2013**
 - High oil prices: production plateau
 - Gas supplies will be tight mainly because of infrastructure constraints
 - Demand will rebound
 - Environmental premium
 - New energies still emerging

- ▶ **Gas prices are expected to increase gradually in between**

- ▶ **Investment should then be kept at high levels to avoid a worsening of an already tight situation post 2015 and a new price peak**