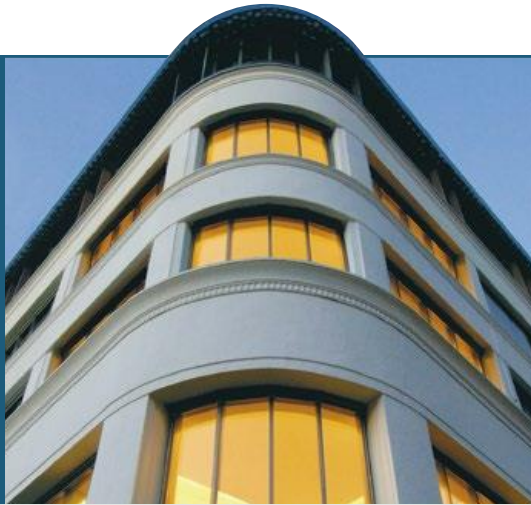


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The Impact of Gas Market Regulation and Liberalization on Gas Pricing

Global Energy 2014

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Outline

- 1. Conditions for a successful competitive market**
- 2. Emergence of gas hubs across Europe**
- 3. The future of gas hubs in Europe**
- 4. Evolution of gas price formation in Europe since 2008**
- 5. Basis of gas price formation in Europe today**

Conditions for a successful competitive market

- Surplus of gas supply
- Access to infrastructure
- Size of the market
- Political will

Emergence of gas hubs across Europe



Hubs in Europe today

Britain: NBP, first European gas hub (1996)

The Netherlands: TTF, 2003, take-off in 2007

Germany: 2 market areas, 2 hubs NCG and Gaspool (GPL) (2009)

Belgium: Zeebrugge (ZEE) (2000) + virtual hub (2012)

France: PEG Nord, PEG Sud and PEG TGIF (2004)

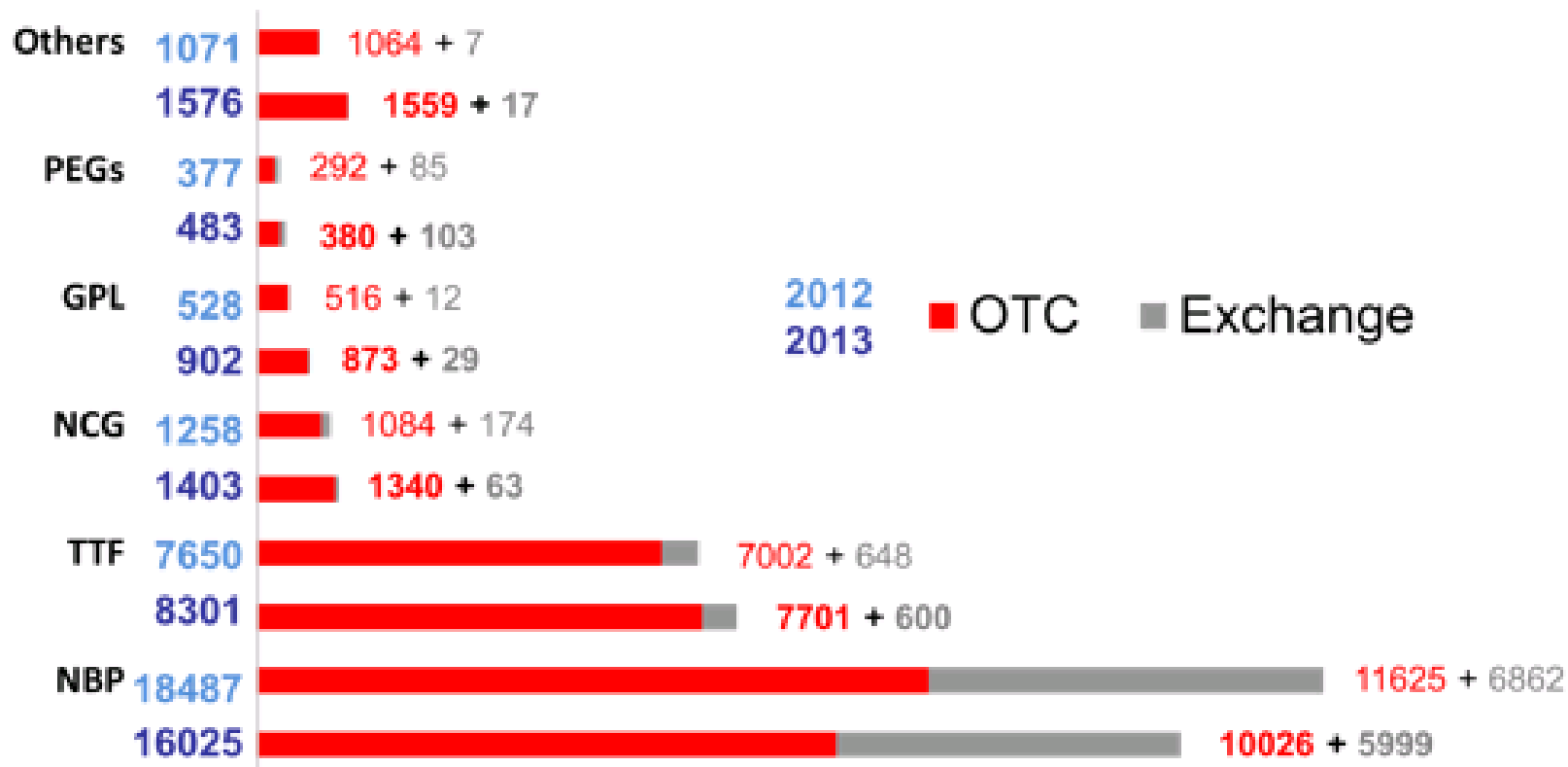
Austria: Baumgarten CEGH

Italy: PSV (2003)

Others

Selected hubs volumes comparisons

Total volumes (TWh) hub vs. hub; OTC vs. exchange



Sources: LEBA; ICE ; ICE-Endex ; EEX ; Powernext ; CEGH ; GME; P. Heather

The principal European hubs

- Europe has 2 mature hubs => NBP and TTF
- TTF is the most trader-friendly hub in Continental Europe
- NBP still leader in terms of volume

The future of gas hubs in Europe

Lengthy process of liberalization

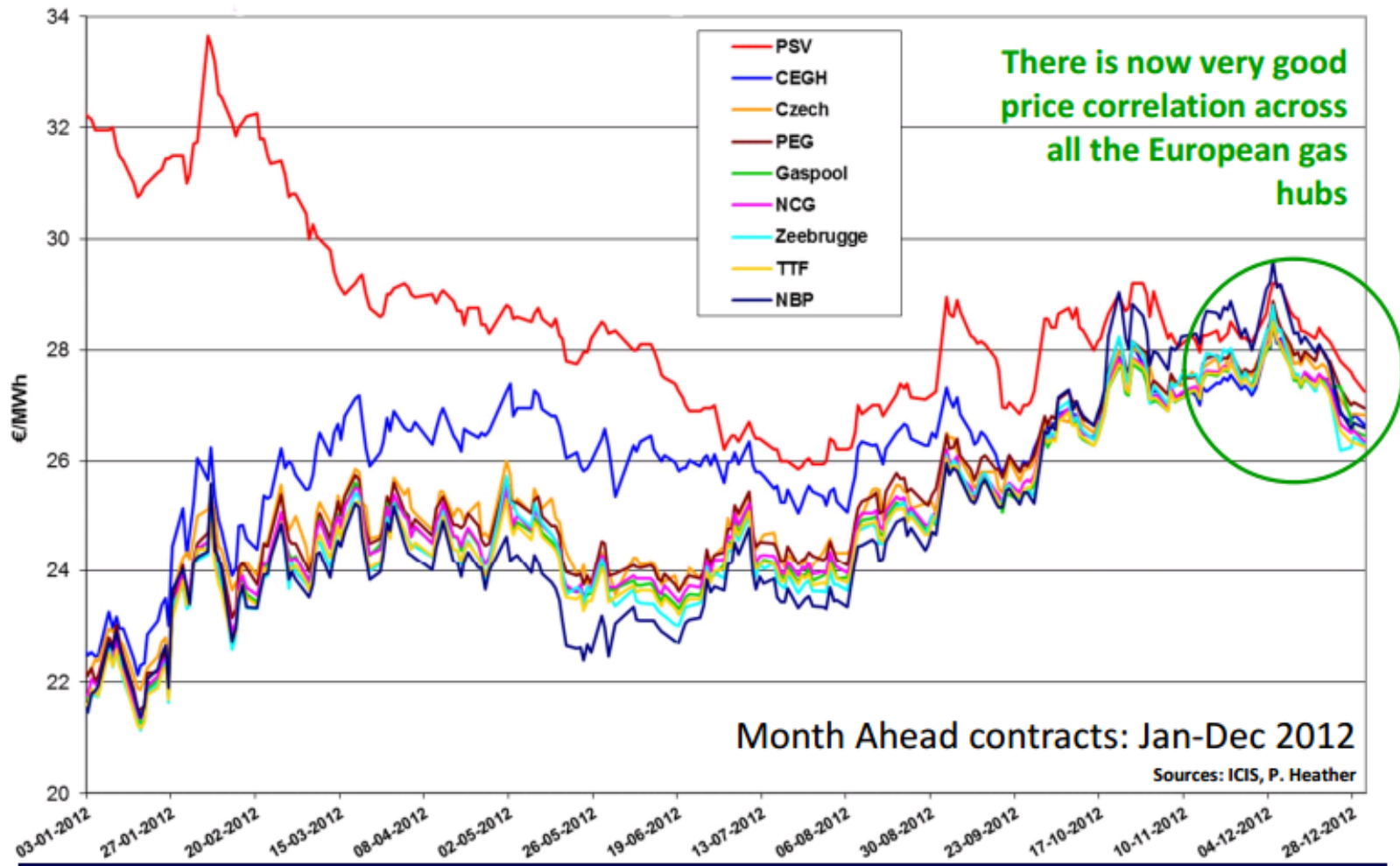
- Even in North America and Britain, transition to full liberalization took time: 15-20 years
- North Western Europe gas markets still some way from full liberalization
- Nevertheless: transformation is happening

The future of gas hubs: likely challenges

- Potential completion of liberalization across Europe by 2025
- Only a few of the new hubs will emerge as pricing hubs
- Absence of infrastructure and of supply optionality

Evolution of gas price formation in Europe since 2008

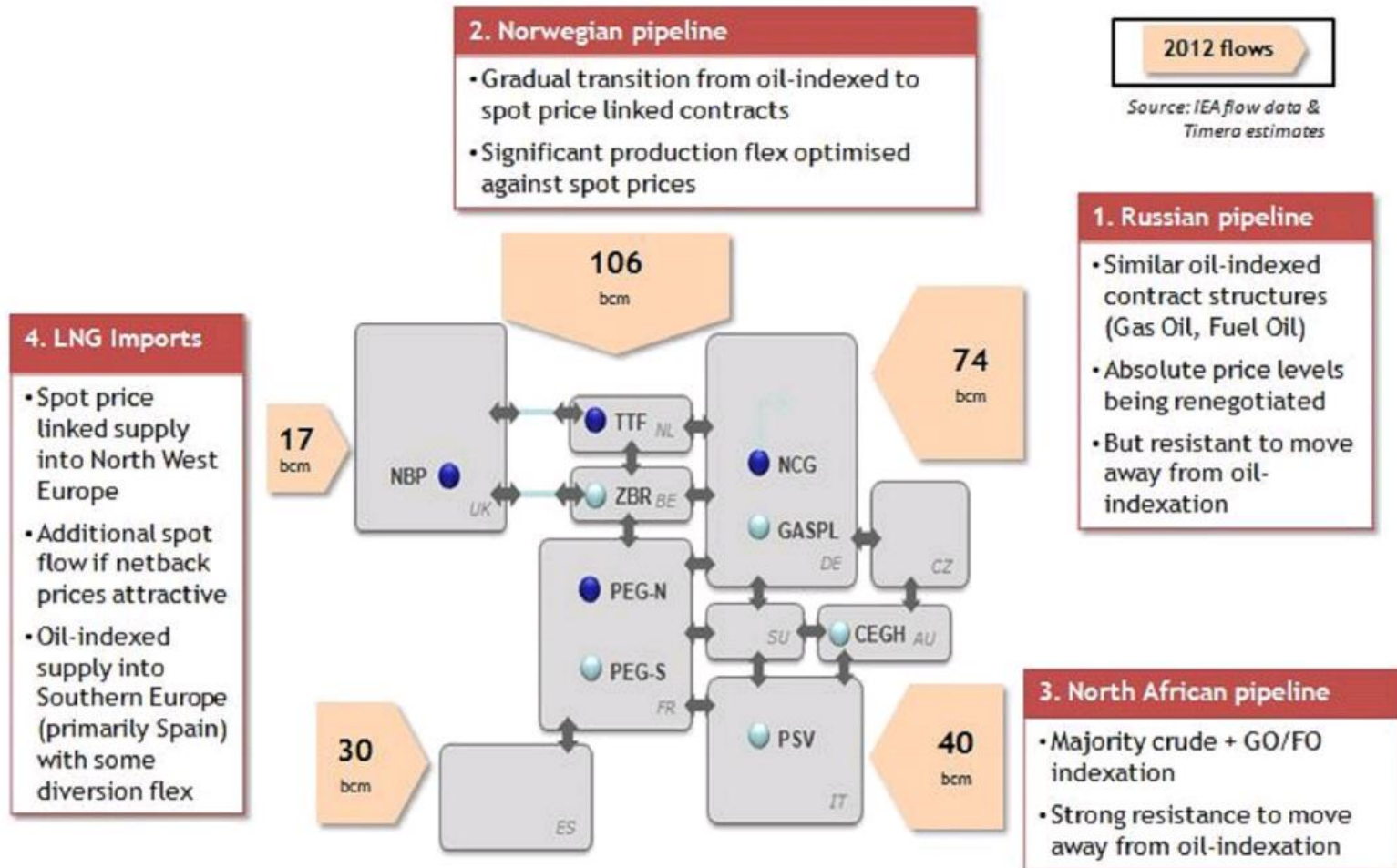
European gas hubs price correlation



Prices under LTCs remain relevant

- Gas supplies into Europe: mainly from LTCs
- Flexible volumes: only a relatively small volume

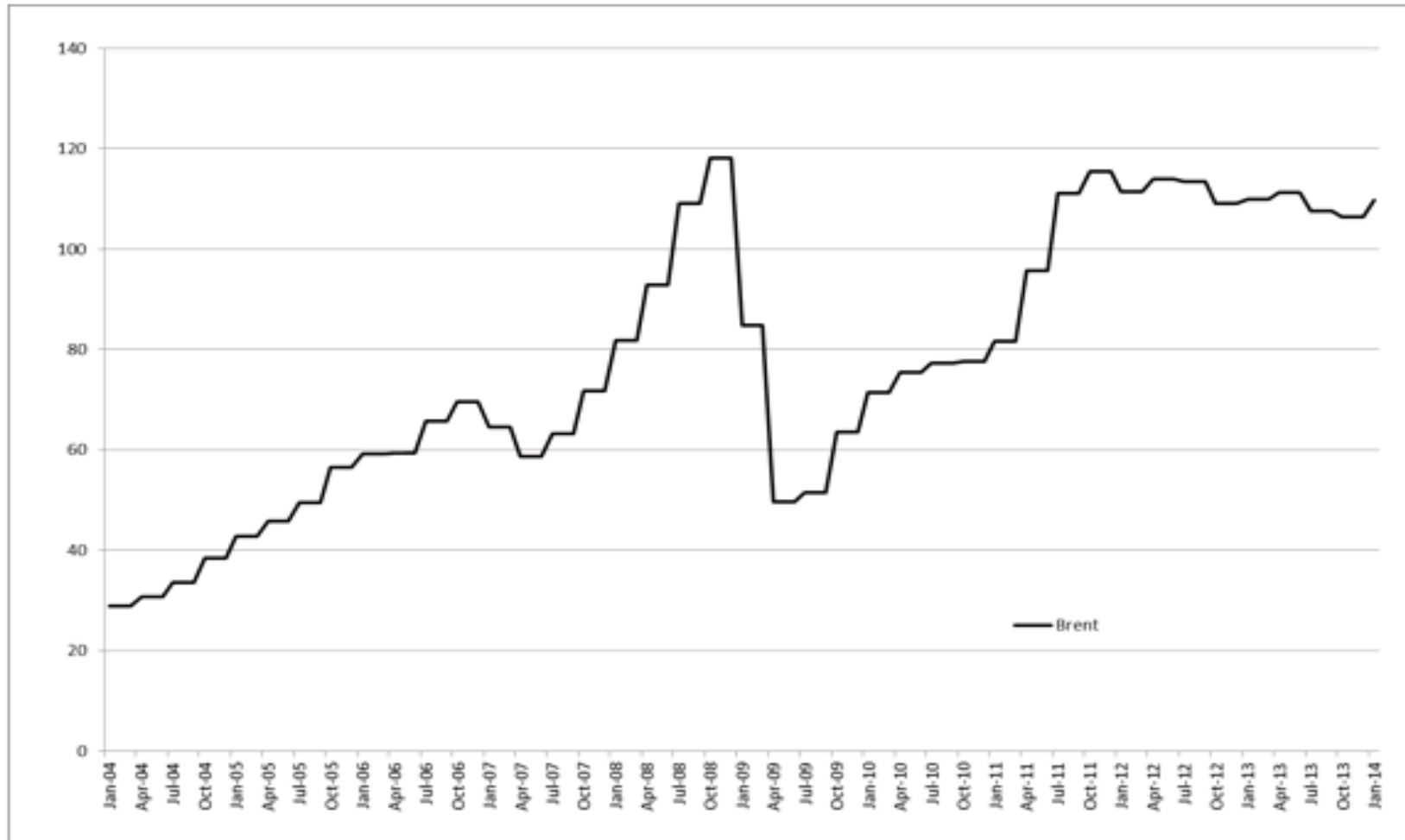
Sources of European gas imports



Shares of traded gas

- In the UK: 50%, figure still fairly steady
- In Continental Europe:
 - Netherlands: ~33%
 - Belgium and Germany: 25%
 - France: 20%
 - Austria and Italy: 10%

Evolution of Brent prices



Evolution of oil prices against gas prices after 2008

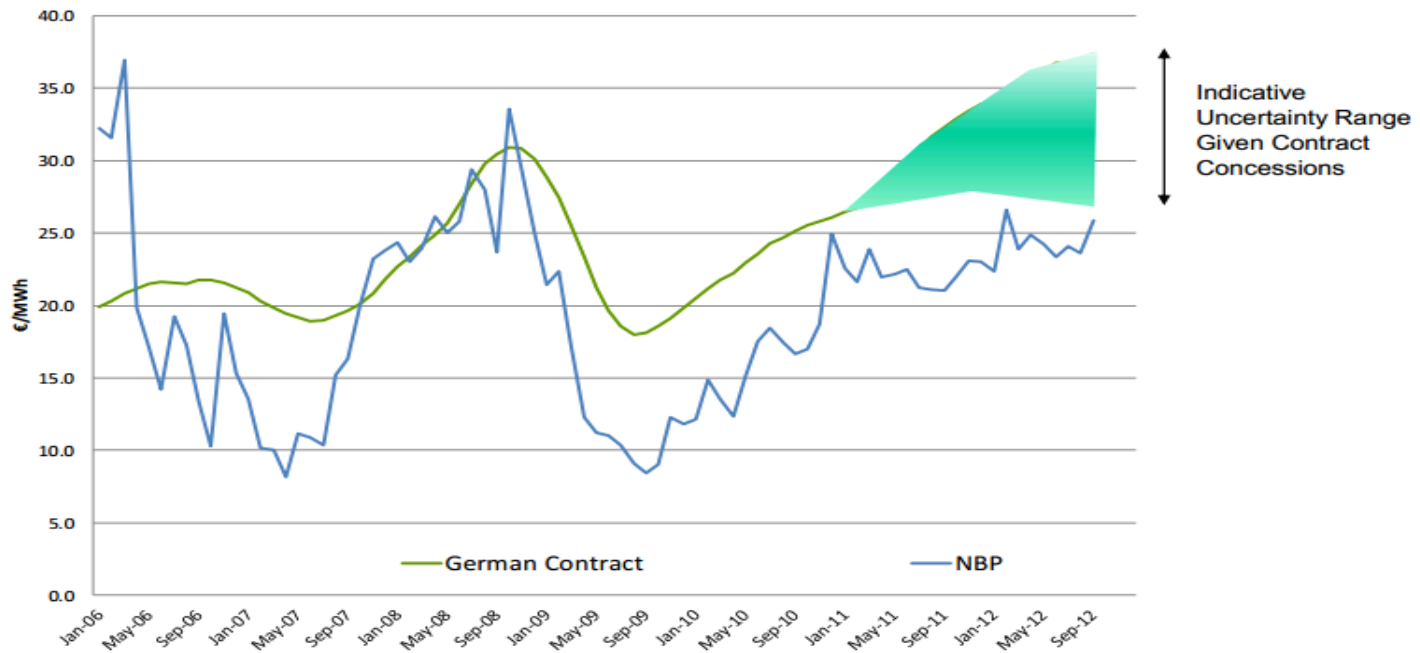
- Before the financial crisis => crude oil and refined oil products as the dominant bases for indexing prices
- Oil prices fell soon after the peak of the financial crisis, but strong rebound in Q2 of 2009
- Economic recession caused gas demand in Europe to fall => contractual surplus of gas
- Increase in supplies due to completion of infrastructure projects + shale gas revolution
- Development of competition between gas suppliers + growth of gas market trading hubs

The impact of the crisis on prices in LTCs

- First quarter of 2009:
 - Western European gas importers found themselves paying high oil-indexed gas prices under LTCs
 - While gas demand slumped
- Price of gas on the hubs “decoupled” from prices in long-term oil-indexed contracts
- Facing losses => Western European gas importers initiated price renegotiations and arbitrations

European prices spread: German contract and NBP 2006-2012

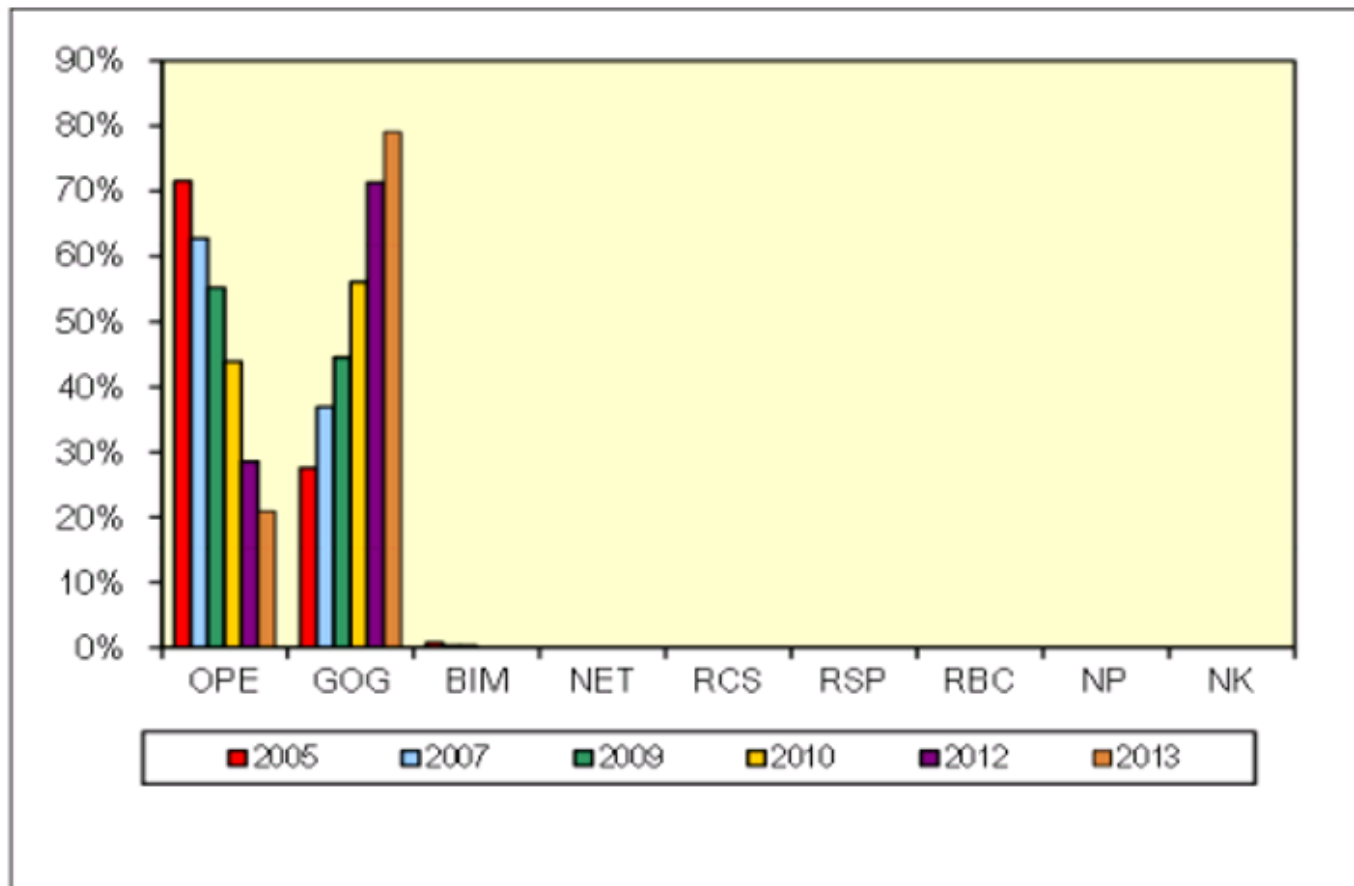
OXFORD INSTITUTE FOR ENERGY STUDIES Natural Gas Research Programme



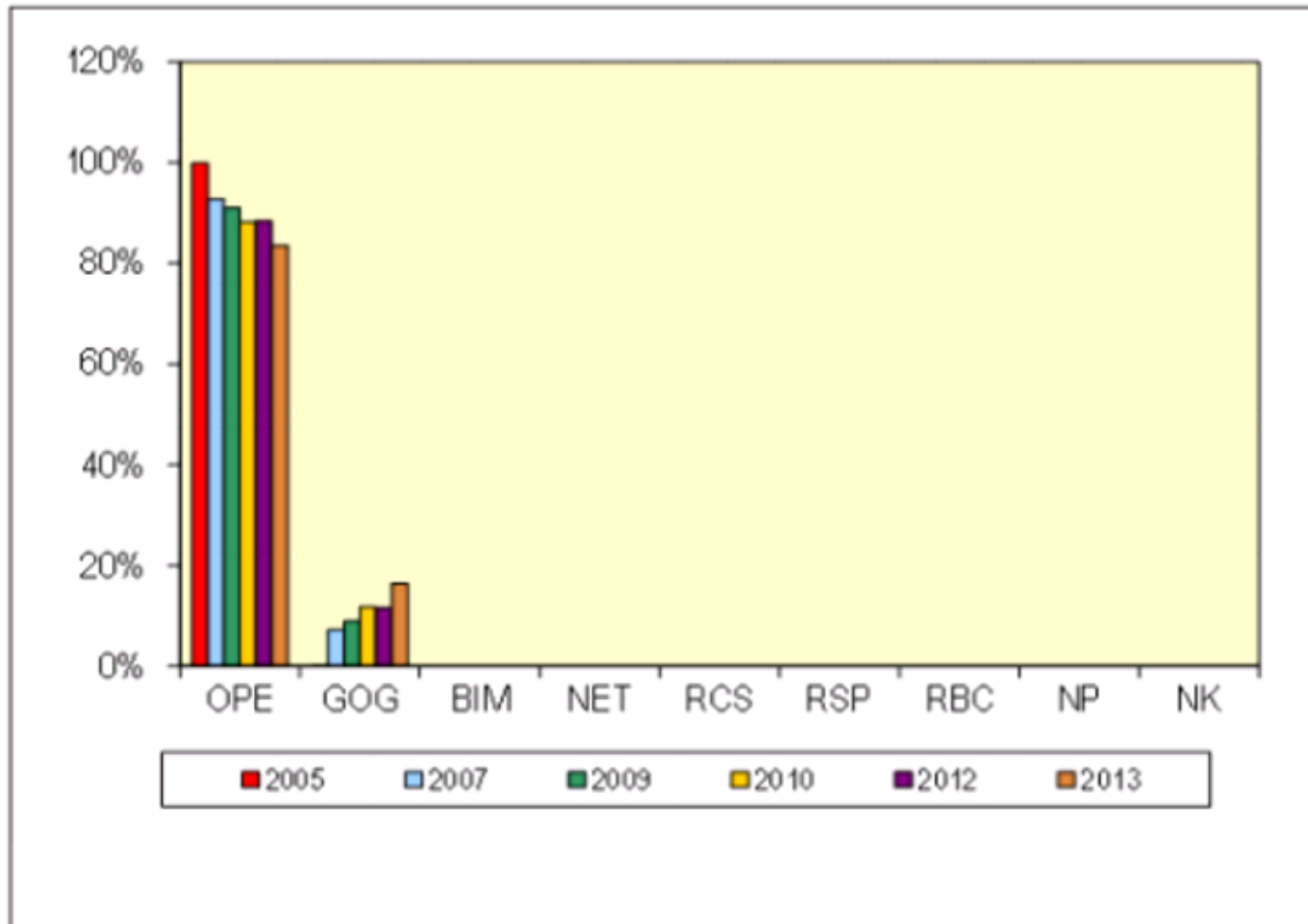
LTC price renegotiations

- Renegotiations had two main tangible results:
 - Reduction of oil-indexed gas prices to make them competitive with spot/hub prices
 - Gas prices shifted away from oil-price indexation towards spot/hub price indexation.

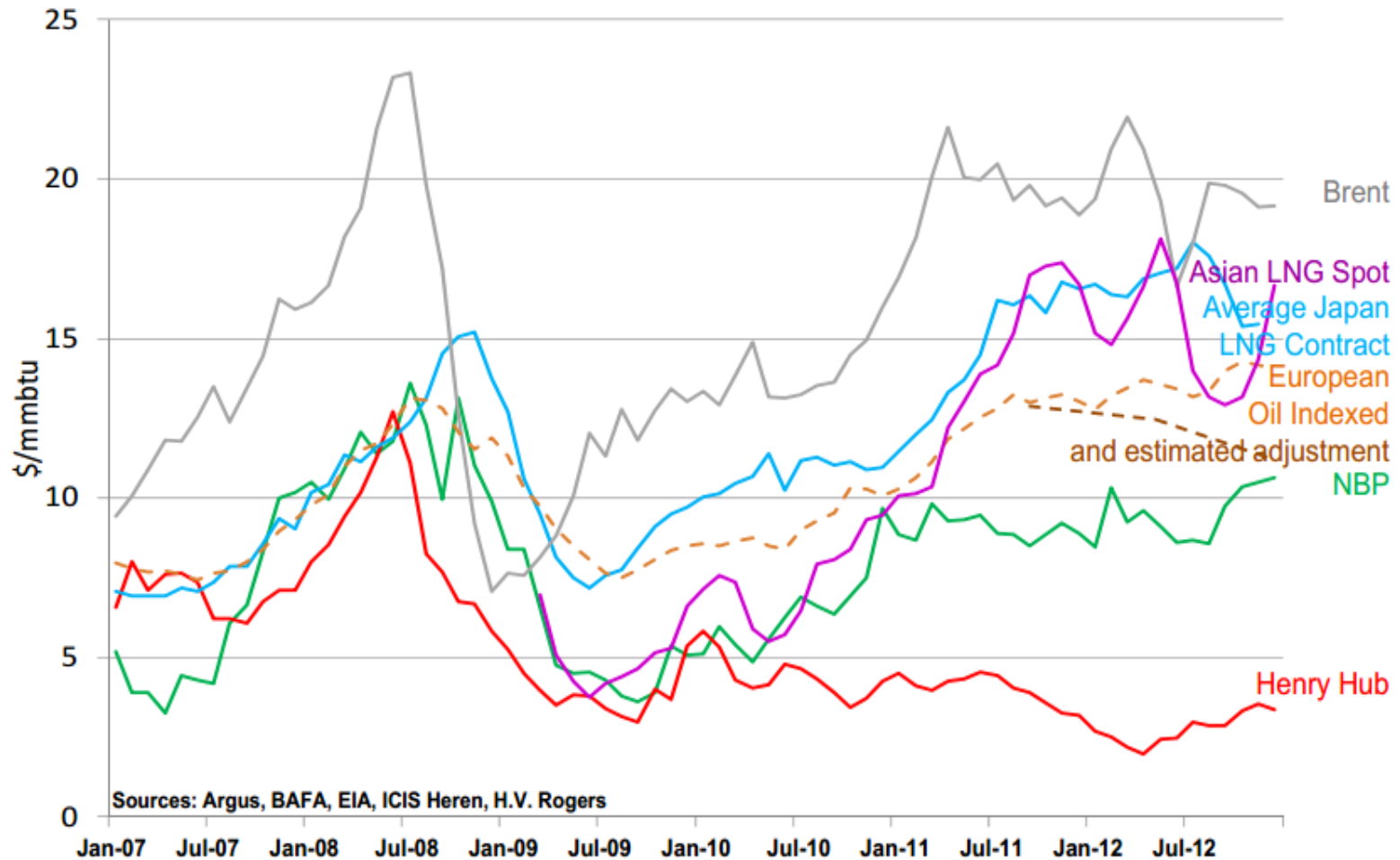
Northwest Europe price formation (2005-2013)



Mediterranean price formation (2005-2013)



Global gas and Brent prices: January 2007 – December 2012



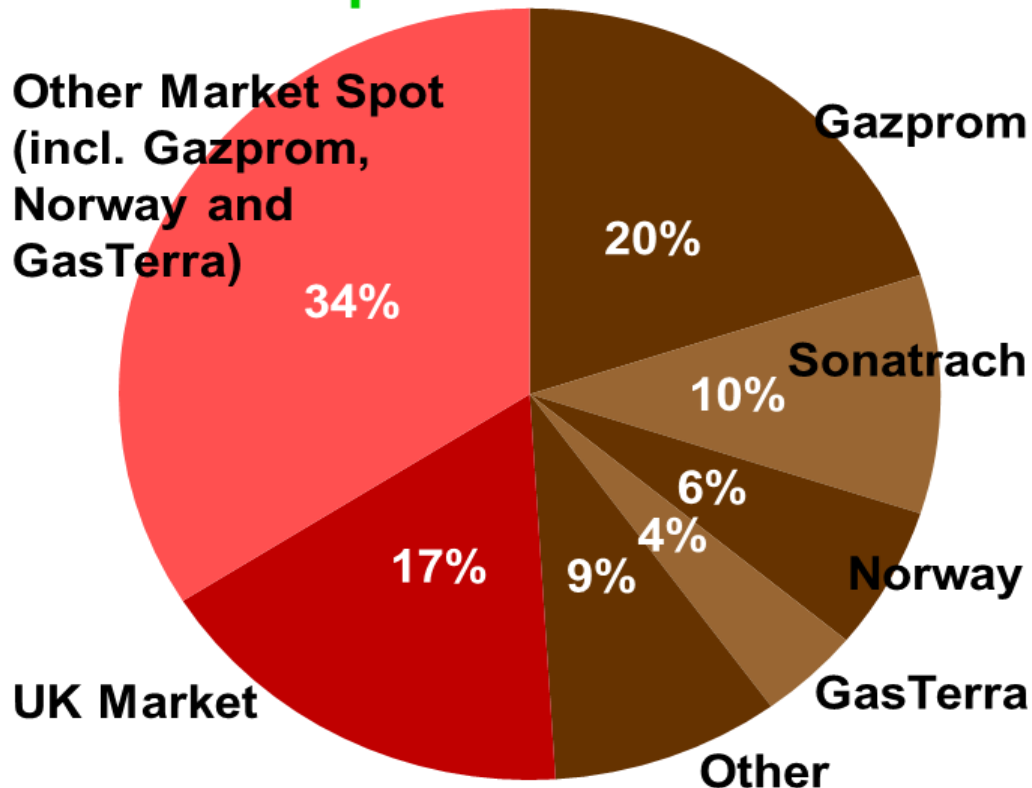
Basis of gas price formation in Europe today

Basis of gas price formation in Europe today

- Britain => all gas supplies priced against NBP
- New contracts concentrate on securing volume rather than securing price
- Pricing structure of European gas markets is slowly also changing

Gas price formation is 51% market priced

Q2-2013
51% market priced 49% oil indexed



Transition to market pricing across Europe is not complete

- Move to market pricing is not spread across all of Europe in the same way
- North and West => definite majority of gas supplied at hub prices
- East and South => still a dominance of oil indexation
- How long the transition will take to complete is uncertain

The relevance of oil prices to gas prices in the future

- Gas competes with oil in the residential sector
- Gas competes with oil in the power generation sector
- Oil-gas linkage may strengthen in the future as a result of direct competition in the transportation sector

Complete disappearance of oil indexation unlikely

- Renegotiations => oil components did not disappear from these contracts, just decreased in percentage terms
- Hub-based pricing does not mean that gas prices will automatically and always be lower than oil-linked prices
- Impact of recent drop in oil prices?

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