

Recent Developments in the European Gas Market

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Agenda

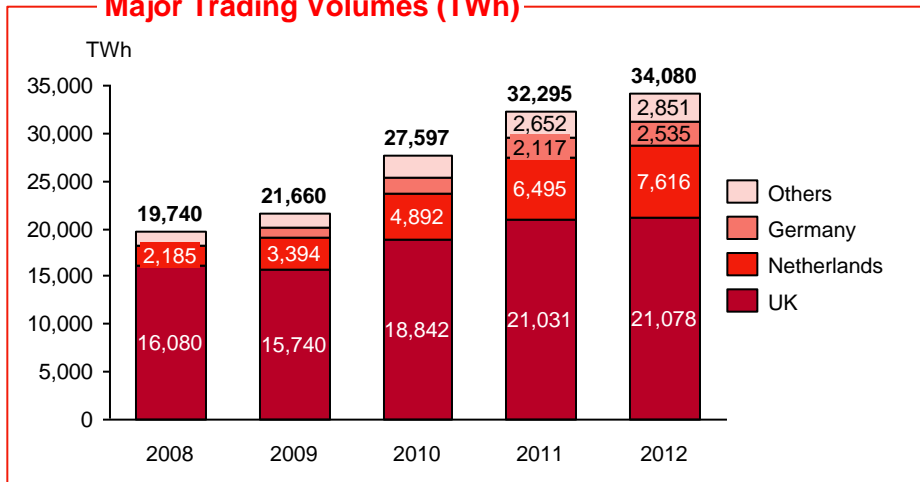
1 Recent Developments in European Gas Markets:

- Trading: Recent developments
- Supply: Impact of LNG
- Demand: Challenges for further demand development

2 Conclusions - Discussion

Gas liquidity increased significantly until 2012 – trend continued also in 2013

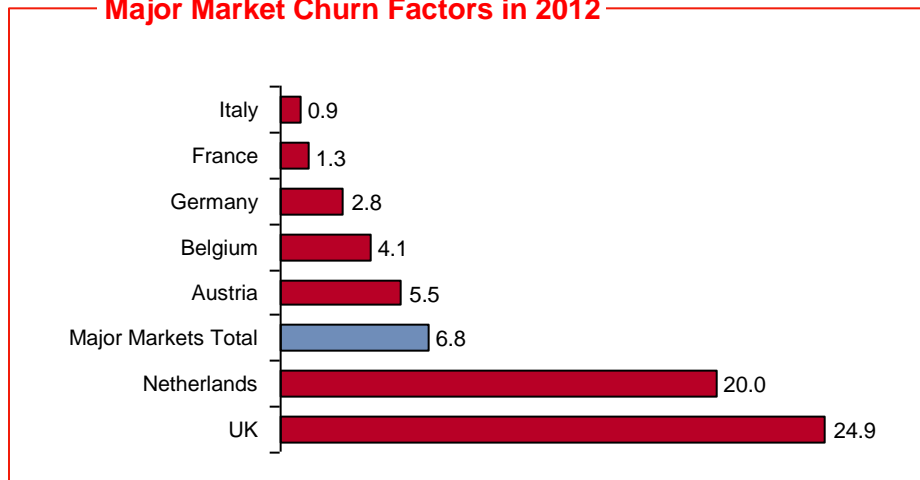
Major Trading Volumes (TWh)



Trading volumes are increasing

- Total trading volumes (exchanges + OTC) in major EU markets increased 73% over the last five years.
- First data for 2013 indicate a further growth for continental markets whereas NPB is stagnating on a high level

Major Market Churn Factors in 2012

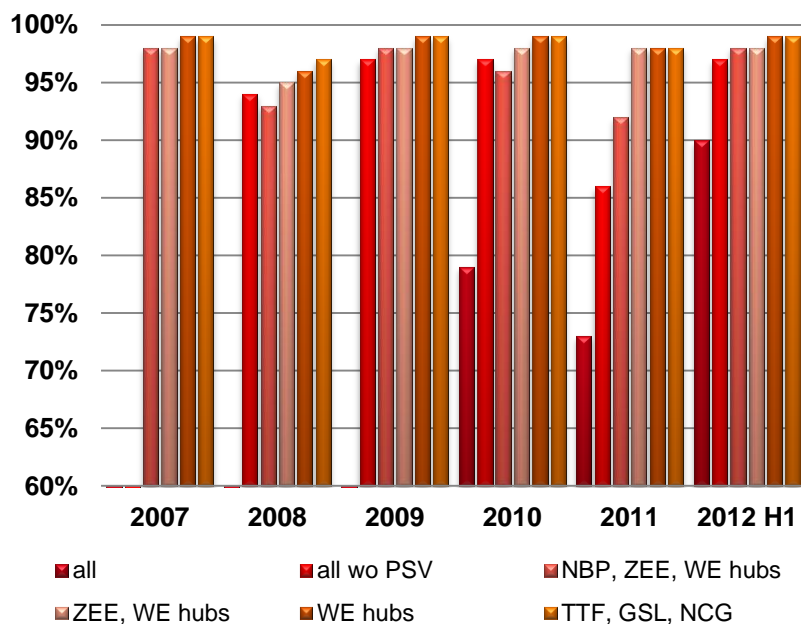


UK stays the leading market in 2012

- Trading activity in UK reached a record level of nearly 25 times physical consumption
- Average churn in Europe increased from 6.3 to 6.8 in 2012

With liberalization of transport capacities in the last years a real European Gas Market developed

Degree of price convergence of European Hubs

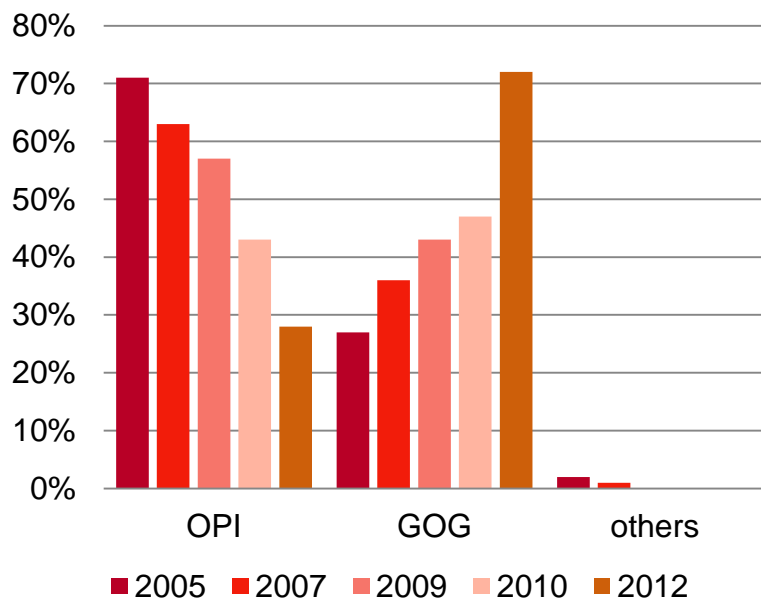


Observations

- Price correlations across hubs are strong and has been increasing overtime
- European gas prices are already part of the same integrated market and deliver therefore a reliable reference for gas in Europe

In Europe significant changes in price formation mechanisms have taken place

Gas Price Formation NW-Europe 2005 - 2012



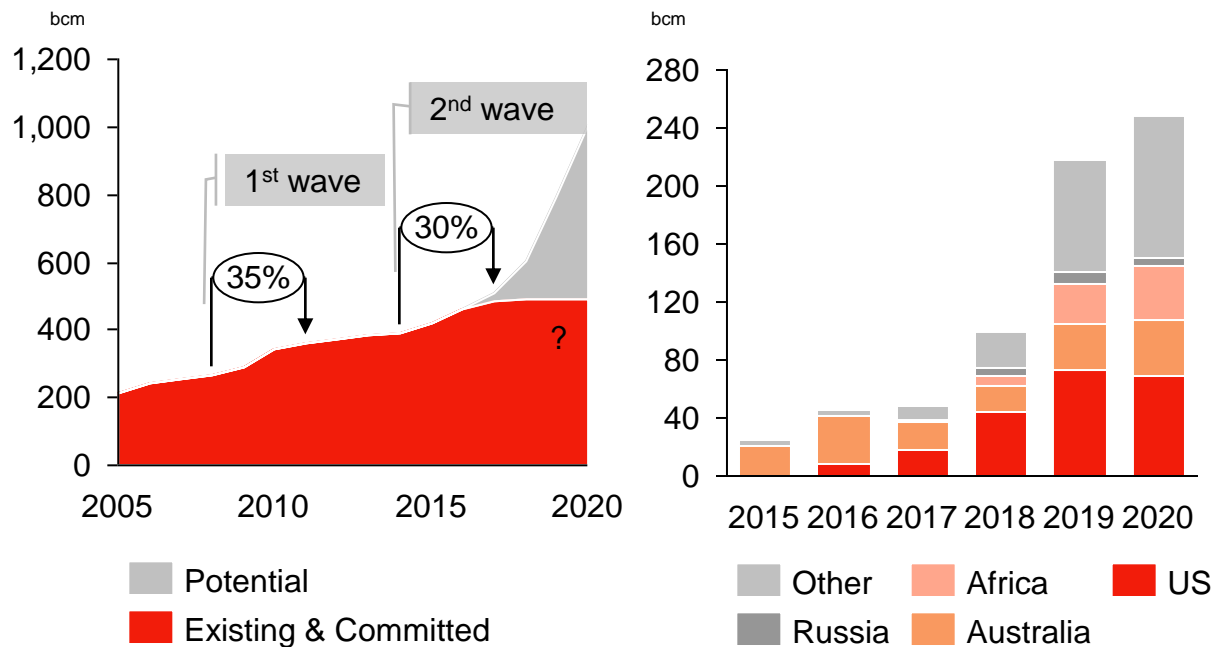
NW Europe: Belgium, Denmark, France, Germany, Ireland, Netherlands, UK

Observations

- Trend towards GOG by the continued decline in domestic production in the UK bound to old OPI contracts being replaced by pipeline and LNG imports, all at GOG
- Netherlands price formation has risen to almost 100% GOG in 2012, from 10% in 2005
- Only <10% of E.ON's customer demand is oil indexed

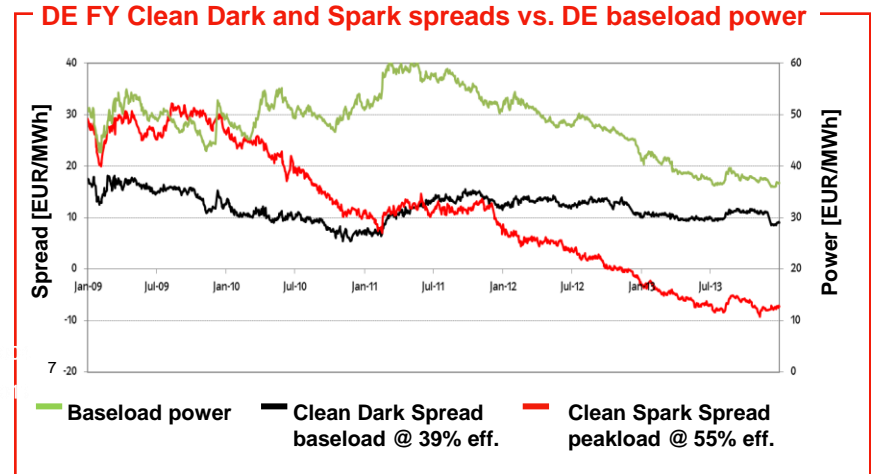
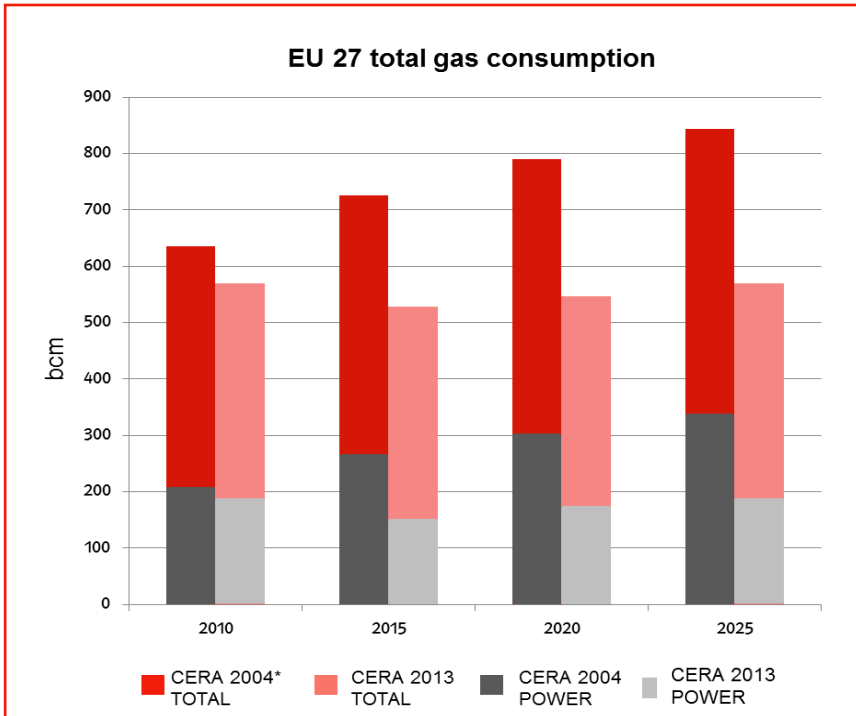
Second wave of liquefaction capacity will boost LNG market and increase imports in Europe

Global liquefaction capacity (left) and annual capacity additions (right)



- More LNG in Europe will lead to further convergence of European prices
- Many LNG deliveries will not have oil indexation but are linked to hub prices (netback, HH etc.)

Gas demand development in Europe remains unclear – predicted golden age of gas is currently no reality



Gas spreads are deeply negative in Germany and more and more gas plants are being switched off or mothballed

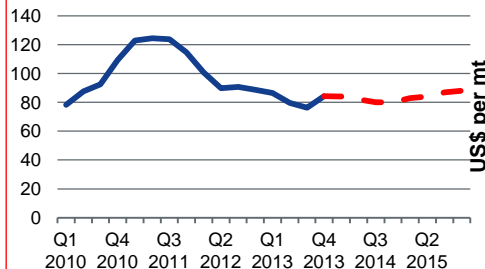


There is also fierce competition for gas demand from coal, renewables and other decentral technologies

Coal prices to remain on low levels

- Coal expected to stay on low price levels (mainly Chinese consumption under pressure)

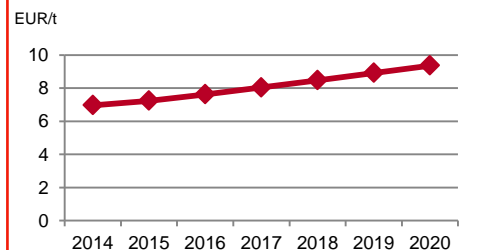
Coal prices CIF ARA



EUA prices will not sky rocket

- Even with backloading CO2 price will stay on low levels

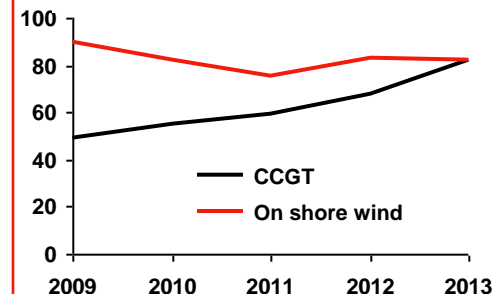
EUA Forward Curve



Renewables efficiency to increase

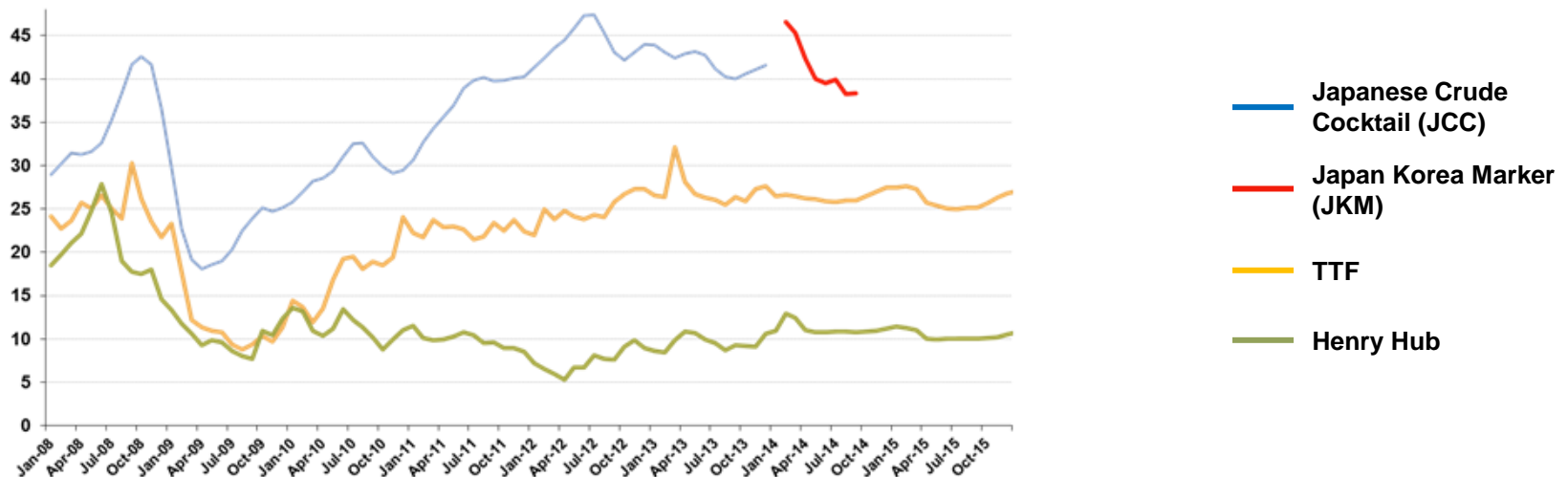
- RES get more and more cost efficient and will grow
- Trend for decentral and clean energy production will continue
- State subsidized housing insulation (e.g. UK, D) and heat pumps

LCOE in US\$ / MW



Additional Risk to European Demand: Very low US gas prices gas may attract gas intensive industry

Asian price benchmarks vs. TTF vs. US Henry Hub (monthly averages EUR/MWh)



“US shale revolution puts squeeze on European Chemical groups” Financial Times in Dec. 2013

“Chemical Companies Rush to the U.S. thanks to Cheap Natural Gas” Bloomberg Businessweek, July 2013

e-on

Conclusions – Questions for discussion



- Hub based pricing is a reality – Why is oil indexation needed apart from that it increases hedging cost?
- How to make money in European markets with decreasing demand, price spreads and volatility?
- How to face the European demand challenges and make gas a more attractive commodity again?