



Market structures for natural gas Continental Europe

How is it relevant for transporting Britain's Energy?

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The British and Continental gas markets are different...

Short description of main markets and suppliers

- Preferences, logic/rationale, business models

The long term contract

- What is it, why is it there, and will it last?
- What does it mean for the European gas flows?

How will Britain be impacted?

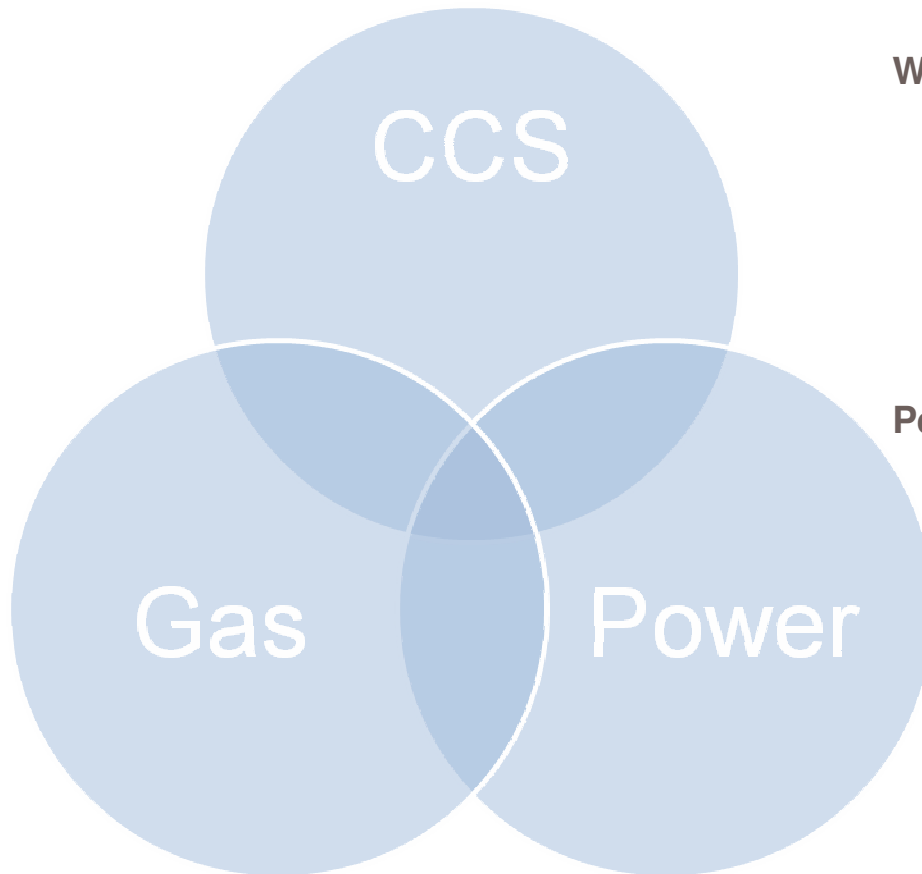
- Now and in the future
- Get used to volatile prices?

Flavour of some industry wisdom:

- “Norwegians will turn down first, as they are closer”
- “the Germans will sell gas to us when the price is high enough”
- “Russians will not turn down, because they need the foreign currency”
- “If we liberalise the gas markets, all will prefer spot and be rational – securing supplies to Britain”

...and it matters to British gas prices and supplies!

Sund Energy helps navigate into the energy future...



Working in Continental Europe as well as Britain makes it easier to see two types of rationale:

- British choice of freedom vs continental choice of predictability
- Both sides struggle to see the attractiveness of the other

Perhaps useful to compare to the choice of being single vs married: Both are valid models, but

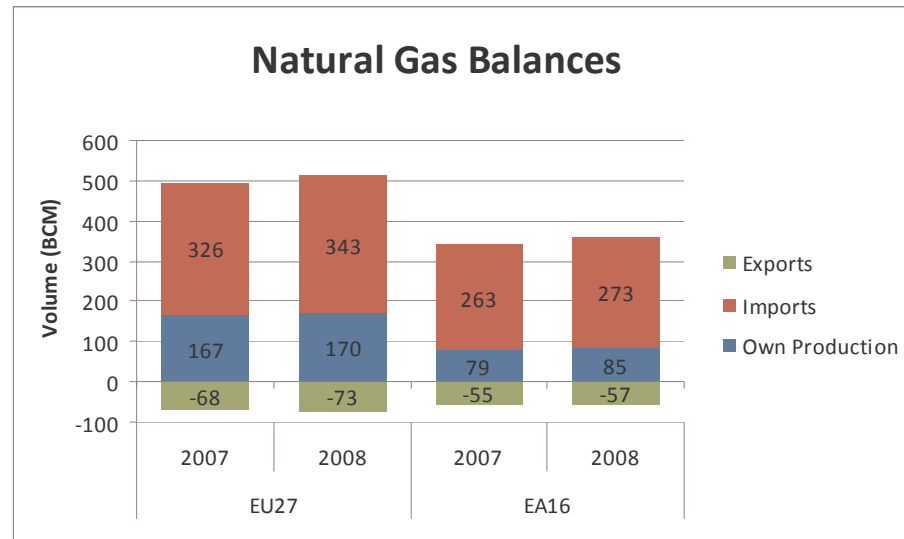
- On a cold winter night, the choice of being single may feel wrong to some
- While on a warm summer day, the optionality of being single may be tempting to some that are married
- However, an important difference: The gas contracts are mostly binding for 20-30, which is more than many marriages...

...by seeing the full picture and designing solutions using diverse and international experience and broad contact network

Europe is becoming more import dependent on gas

Continental Europe is highly dependent on imports:

- Russia 36.8%
- Norway 26.1%
- Algeria 15.4%
- Nigeria 4.2%
- Libya 3.1%
- Qatar 2.4%
- Others 12%



Source: Eurostat, 2009 (data in focus 16)

Most of this is on long term contracts

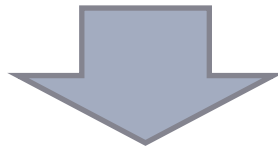
- Estimated 300 bcm on binding contracts still in 2030 (eurogas)

European hubs and spot markets are growing – but mainly supplementary and for internal balancing

Back in time – some history

Traditional in 70's / 80's: Many contracts were signed

- Foundation for British gas production, transport to shore and sale to British Gas
- Absolutely necessary to underpin Norwegian developments
- Russia and Algeria also see a possible demand in Europe



Long term, binding gas contracts!

- Ensure volume commitments: Take-or-pay reciprocal
- Ensure acceptable price to both sellers and buyers
 - Oil link to be competitive with oil products at all times

Long term oil-linked contracts was the solution...

Markets also needed assurances

- Competitive price
- Availability / security of supply
- Some infrastructure needed
 - customer contracts often back-to-back were important
- Gas became the new favourite fuel:
 - Predictable, acceptable, affordable, and environmentally good!

Secret contracts, but remarkably similar, to Continental Europe

- Large pipeline contracts from Russia, Norway and some Algeria
- LNG contracts from Algeria and more remote suppliers
- All oil linked and with similar flexibility
 - but some smaller differences

Fast forward to the “Naughties” – still life!

Deregulation has split some contracts, but volume remains

- Some sellers broken up (GFU) and some release gas auctions

Buyers keep extending existing contracts, seen as “safe”

- Security of supply, predictable, stable and less volatile than spot

Sellers extend much for the same reasons

- Comfortable, “security of demand”, stable
- Similar to oil, easier to understand for analysts and management

LNG has entered spot and finding it less fun than expected...

- Better to be the marginal supplier to tight markets – when?
- Motivation for entering new markets, such as Poland?

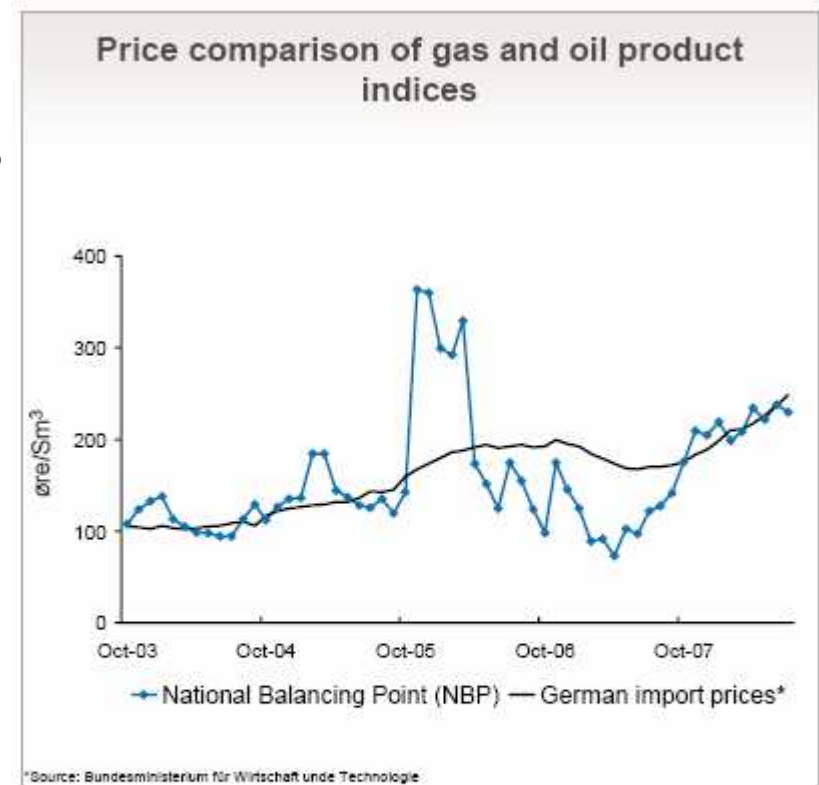
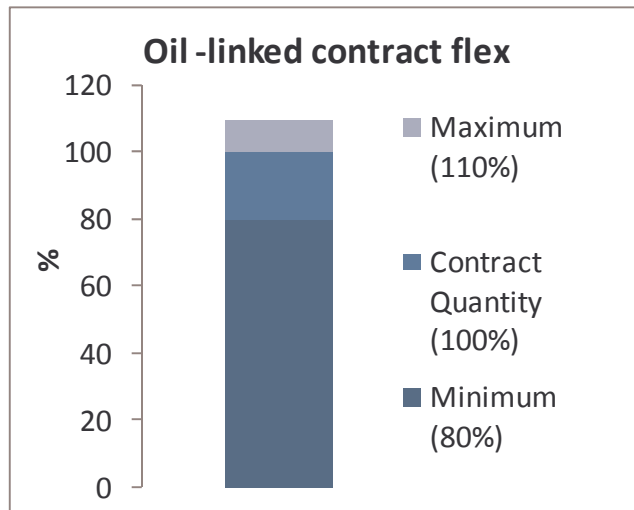
Power generation seems to be positively surprised – once they try!

- “Asset” to trade around – better at balancing than oil companies
- Before trying, disbelief of existence – and would prefer coal link

The legendary long-term gas contract is alive and well!

Oil-linked contracts

- Price is indexed to oil products
 - Typically gasoil and fuel oil
- Some volume flexibility
 - Take-or-pay commitment balanced over the year



StatoilHydro

...but would this structure have been chosen today?

Regime established by oil companies and large importers

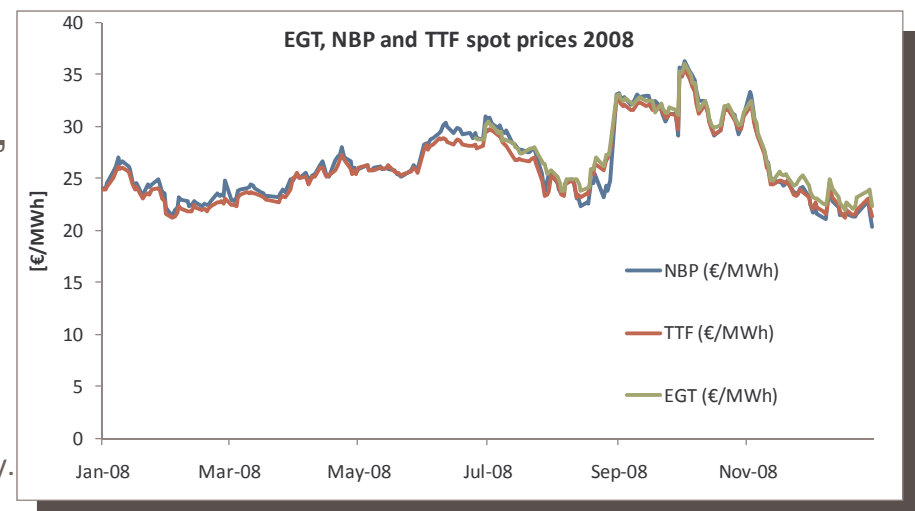
- Both relatively volume driven, initially
- Some are still sceptical to spot...

Today, the power industry would have had a stronger say

- Perhaps more natural to informally link to coal as alternative
- More spot prices to reflect payability at peak and to balance market

If Europe were to choose a market place to balance its gas...

- Germany would have been a more natural location
- Today, bottlenecks of Britain impact all European spot prices, sending misleading signals and discouraging some flows between the markets



The main players – a short introduction and profile

Supply side is relatively production driven, but some variations

- Gazprom – largest supplier to Europe – all pipelines and LTC
 - 2009 lower nominations has resulted in lower production
- StatoilHydro – second largest to North West Europe and UK
 - Listed company with strong drive to increase production
- Domestic supply – UK, NL and Germany ++
 - Some more room for flexibility with proximity to market

Demand side is a mix of volume and price in focus

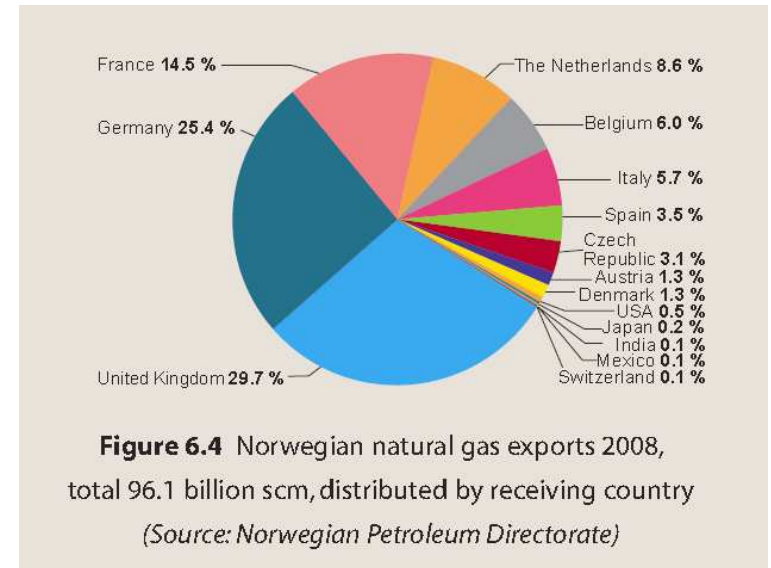
- EonRuhrgas – largest importer in Germany and quite commercial
 - Optimisation possible between contracts/suppliers and in time
- GdF, Eni, GasNatural and others – smaller and more stable
 - More flexibility from LNG and optimisation, less impact on flows to Britain

Focus today on Germany and Norway – most impact on British flows

Norwegian exports to the UK vary, partly due to contracts...

Several phases of supply to UK

- Initially, long term contracts
 - Falling imports with growing production
- Spot prices and deregulated market needed new business models
 - Market over supplied at first, then expected to be short
- New pipelines planned
 - Labeled by Hydro, more used to spot



Now, some contracts, but mostly spot – more variable and unpredictable

- Legal commitments in continental contracts give these priority
- Production targets give in variations in UK flow:
 - Interruptions upstream + differences in contractual nominations
 - May at times be counter-intuitive to UK traders
- Contracts less physical than to continent: Can be balanced with NBP
- Hardly any forward sales

...but also upstream issues

Gassco operates the pipelines, on shippers orders

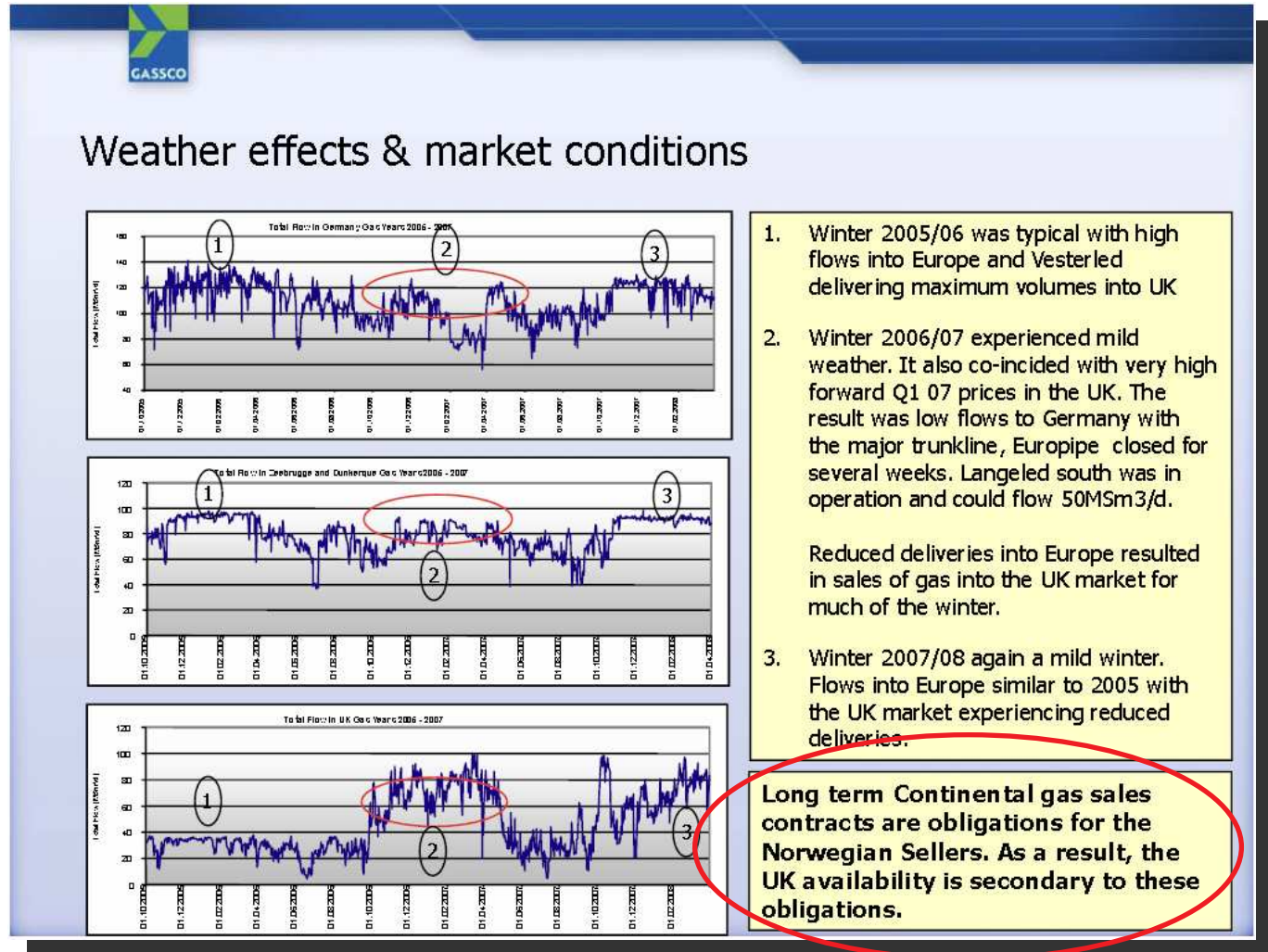
Shippers dominated by StatoilHydro, selling own + state gas

- Large part of their portfolio to continental buyers
- Legal obligations here impact available gas for spot markets
- Holding back gas is not part of the business model
- Some choice in where and when to send “free gas”

Picture from Gassco shows different flows over three years

- Germany
- Belgium/France
- UK – most volatile

Price not main driver



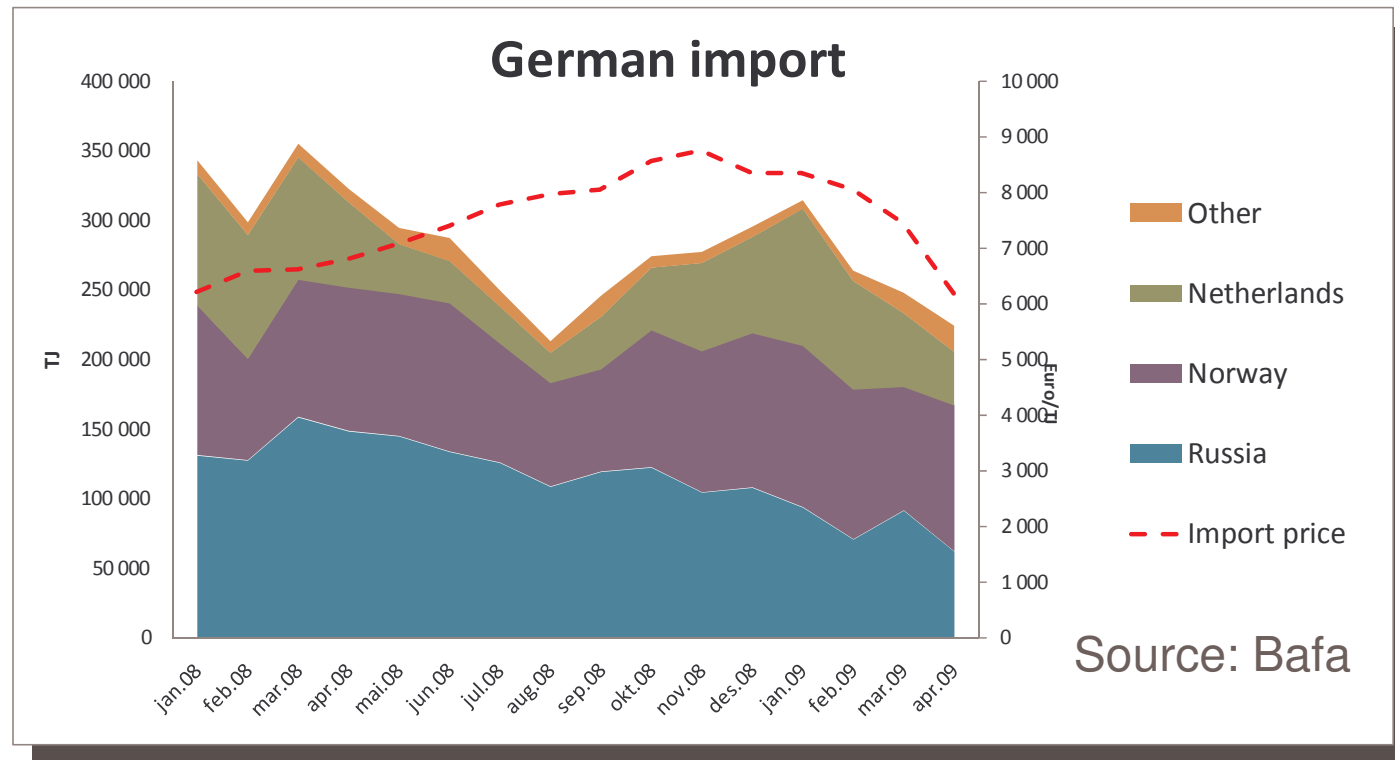
Germany: A gas giant with diverse imports

Long term oil linked contracts for import, but still some variation!

- 2008 had high prices and early signs of recession in second half
 - Early 2009 has lower prices but more recession
- Russia has been nominated down more and have reduced production, while Norway has increased production in 2009
 - As a result, Gazprom made \$440/000m3 and StatoilHydro \$360/000m3 in Q1 (Heren, June 09)
 - Two points: Some difference in time lag of contracts and different use of spot

“In the short term, Gazprom has proved to be uncompetitive in Europe and lost its market share to the Norwegians, who were ready to make discounts”

*Vladimir Milov,
Energy Policy Institute,
Moscow, June 2009*



Source: Bafa

Germany can optimise its gas sourcing

Level 1, source: Nominate up the cheapest of Norway and Russia

- Some differences in lag/mechanisms - done for many years
 - Also some difference in range of flex and take-or-pay obligations

Level 2, time: Nominate up in cheaper months, down when expensive

- If summer max oil prices hit in November, take more in October

Level 3, balance physically: Store, sell gas at home or export?

- Use some storage, flex in other contracts, and own spot
 - Rushed into spot markets, “borrowing” the NBP price – “ricochet effect”
- No incentive to export (also no points for being more vulnerable)

Level 4, use information: Understanding impact on spot market

- Advantage of being pan-European

Quite rational, legal and to be expected

What is the impact of European markets on Britain?

Average German take from Norway is roughly 75 mcm/day over the year

- Daily flows could reach 130 mcm/d, or be much lower... (see Gassco picture)

Summers see lower nominations, and recession contributes to this

- To supply the lower range of monthly flows more gas will flow to UK

Unexpected volumes impact the UK spot price!

- If the price is low already, this indicates oversupply
- For re-export or injection into storage, the price may need to come down further to accommodate additional volumes

A typically cold winter's day can have a more dramatic effect

- Germany can take full capacity of around 130 mcm/d – January 09
- Less supplies to the UK than otherwise, even if the price is high

Significant price increase, especially if UK is undersupplied

- Forward selling or even warning could alleviate some of the volatility

Impression that “last” priority is OK gives volatility!

Electricity – important in future gas flows and prices...

No automatic choice of gas technology any more

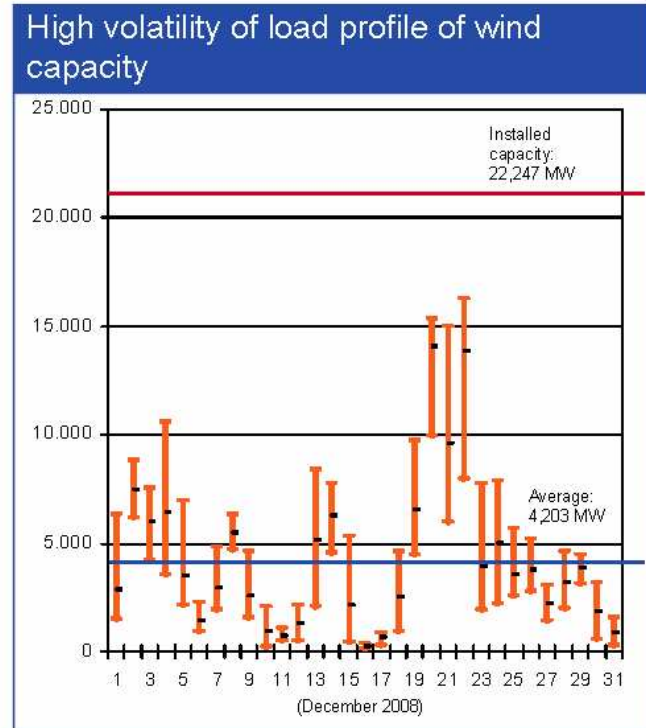
- Price important in short + long term
- Need for balancing growing – especially in countries without hydro power

Skilled gas traders, taking advantage of different risk management

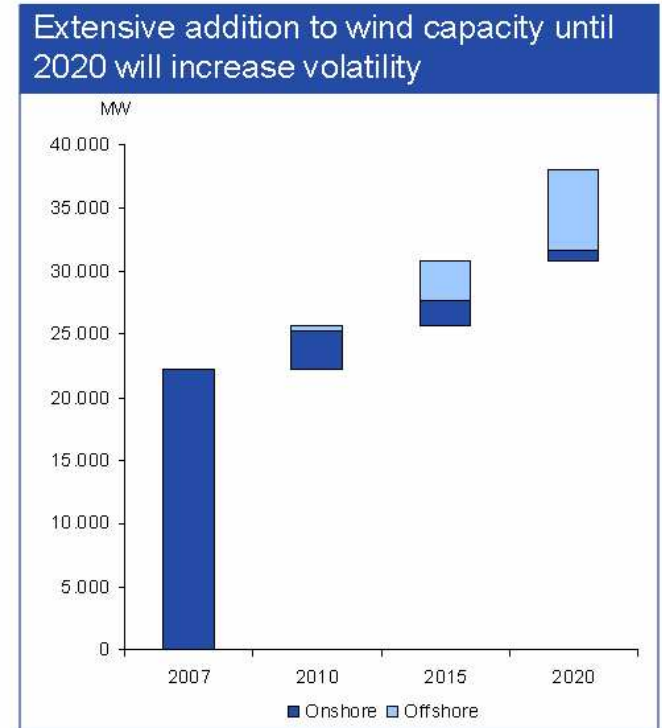
- Attracted by LNG and storage as well

Able to balance gas market if suppliers are production driven, but need some notice

Wind generation adds Megawatts (and volatility)



Source: BDEW



Source: BMU

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Future outlook for gas flows is interesting

The current market structure in Europe has been well suited for the historically steadily growing base load demand

- Every time the demand forecasts grow, a new (diversified) long term contract is added – contributed to infrastructure developments

New challenges will have new needs for agility

- Recession of 09 is testing this: Ability to adapt supply to falling demand
- Increasing need for balancing in the power industry with either fixed baseload (nuclear and possible CCS) or less predictable wind energy
- Possible security of supply issue of sending gas from west to east in Europe – adding do variations in flow

How will the gas industry react?

- More use of price for balancing?
- What will be the rationale of each player then?
- Will Britain be the winner in attracting new gas longer term?
 - and will it need to??

We are happy to discuss further!

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