



Liberalization of gas markets and gas prices

3rd NMa/Tilburg University Energy Economics Policy Seminar

23rd April 2009

- Overview
- Oil indexation
- Deviation from oil prices
- Specifics of retail prices
- Summary

Overview

Long-term (import) contracts

- Continue to be oil indexed
- Continue to determine general price movements in the markets

Spot prices

- Fluctuate around oil prices and long-term contract prices
- Move with the oil price in the medium and long term

Retail prices

- Move in line with oil prices (mechanically due to indexation, in the long run due to inter fuel competition)
- No clear tendency for retail margins after liberalisation (in Germany)

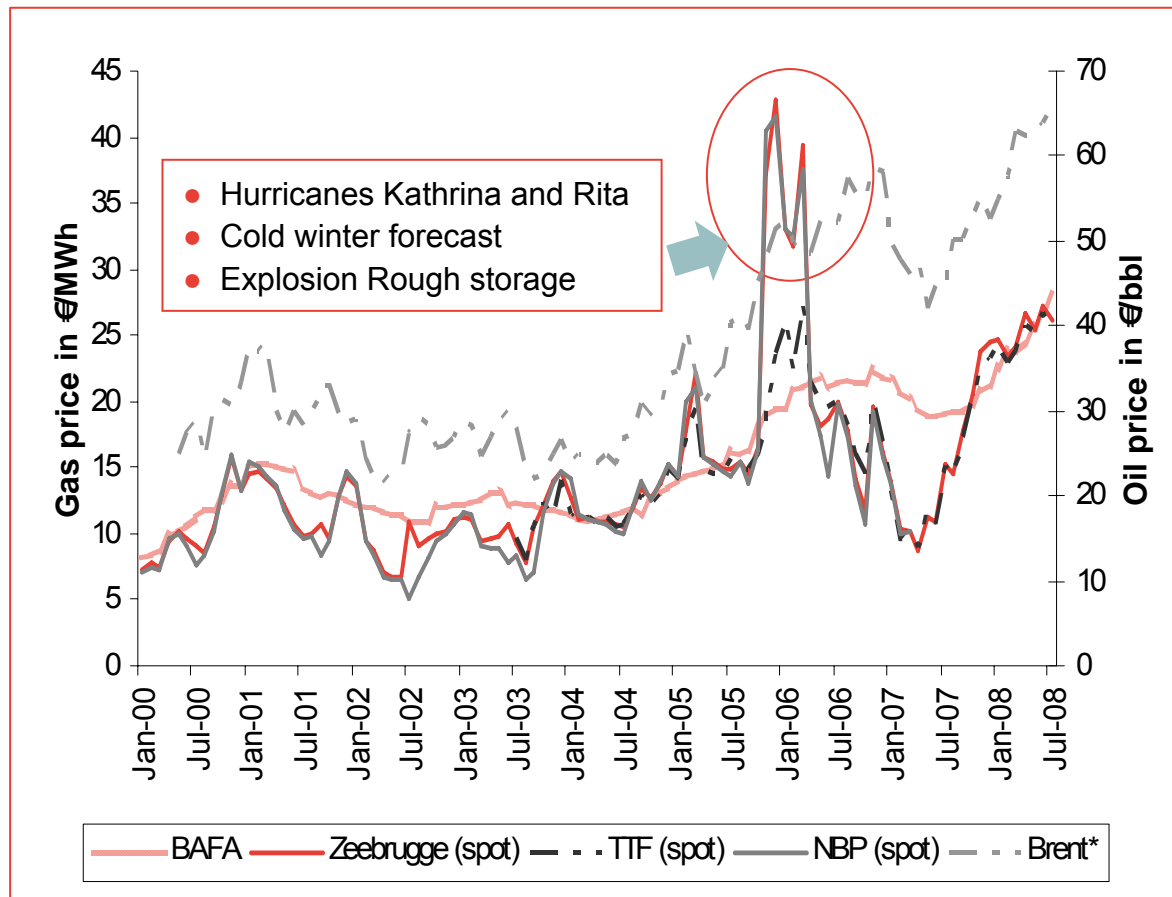
Gas prices in Europe – spot and contract

Spot prices (formed as marginal bid price)

- Follow pattern of oil prices by lag of almost 4 months
- NBP (UK), Zeebrugge and TTF move closely together
- Wider spreads in case of interconnector congestion

Long-term contract prices – e.g. BAFA (measured as average market price)

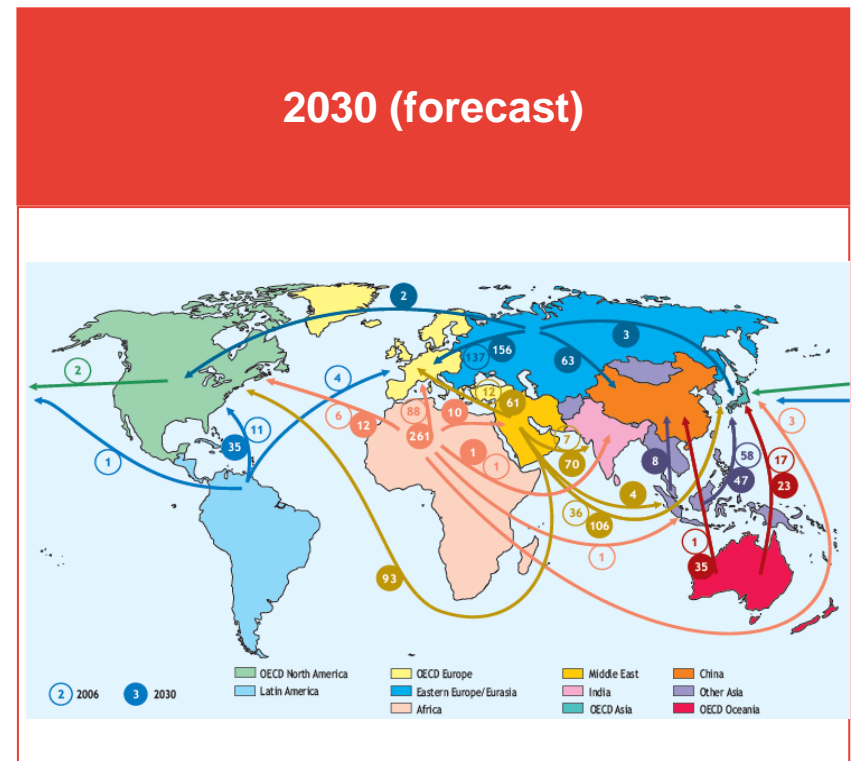
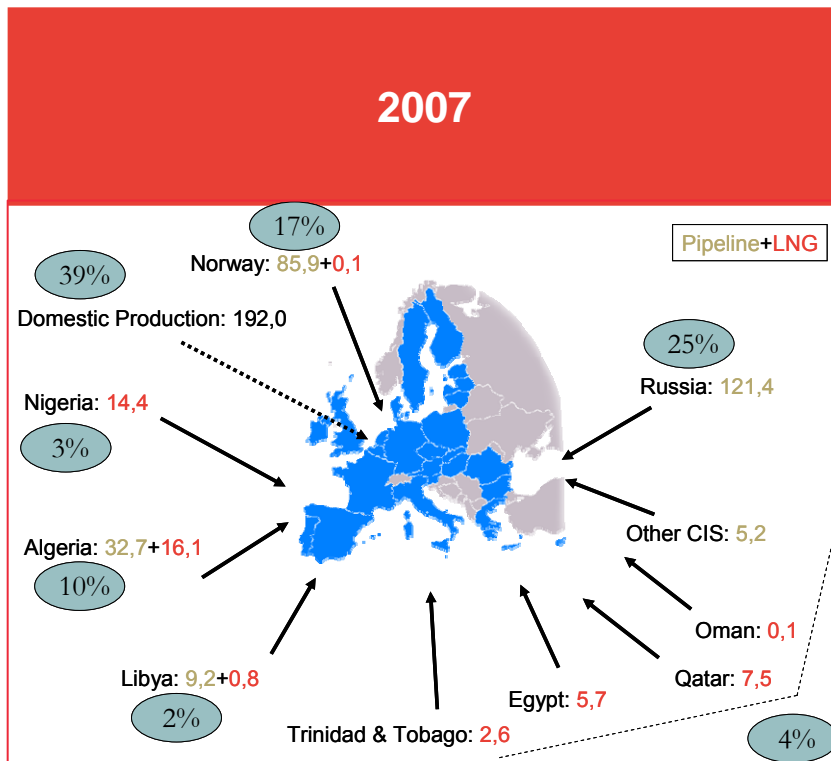
- Follow the oil prices in a lagged and smoothed manner
- Tend to be higher than spot prices on average (e.g. TTF)



* Note: Oil price is lagged by 4 months (i.e. the price shown for September is actually the price observed in May)

Source: Frontier based on Energate, Heren

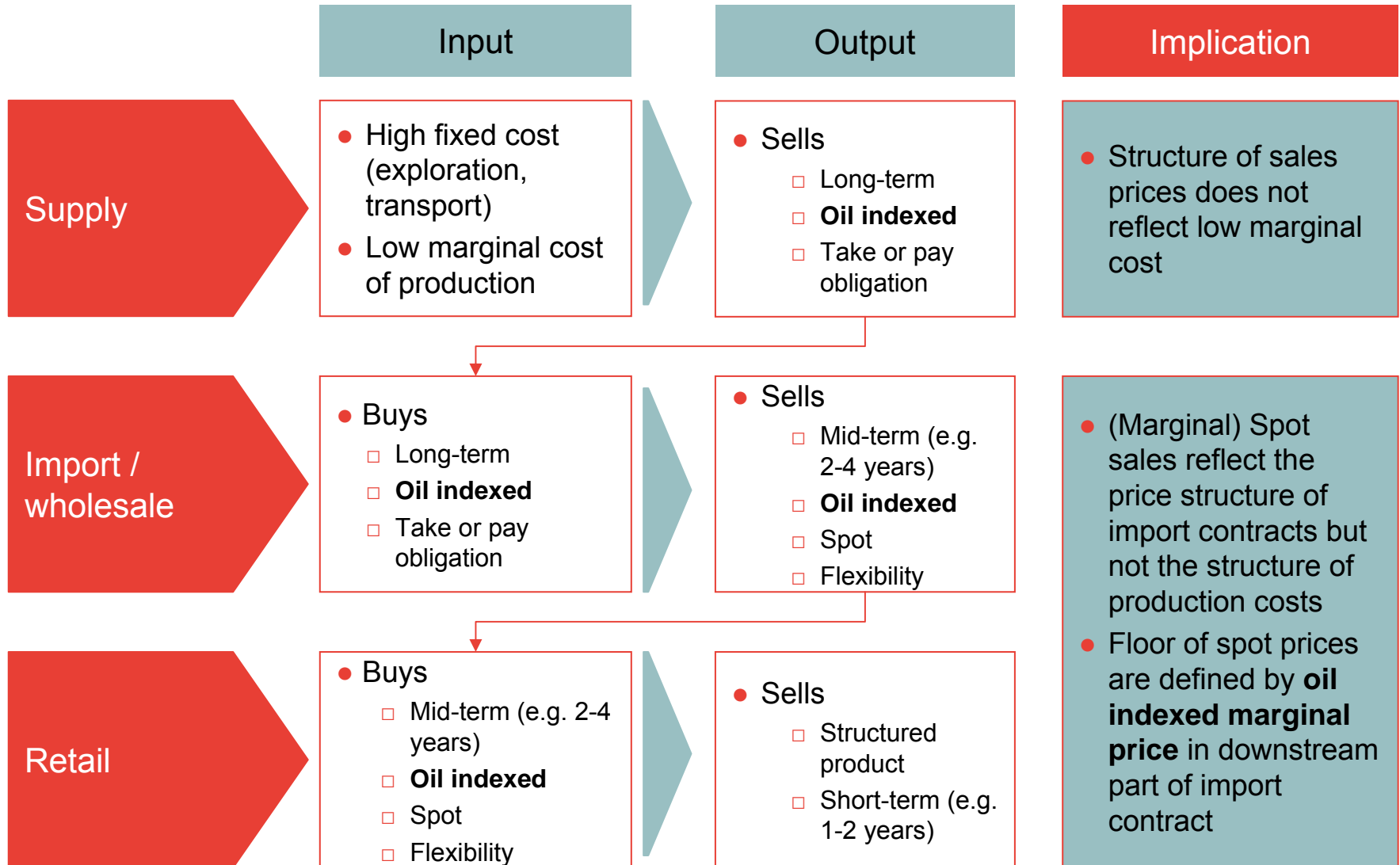
Setting the scene: Europe will become more and more import dependent on a limited number of players



- Import needs will increase significantly in the next decades due to fall in local production and demand decrease
- Dependency on a few traditional supply countries like Russia and Algeria will increase and additional supply will mainly arrive from the Middle East
- Nearly all suppliers from these states are state-owned companies (e.g. Gazprom, Sonatrach, QP, NOC Iran)

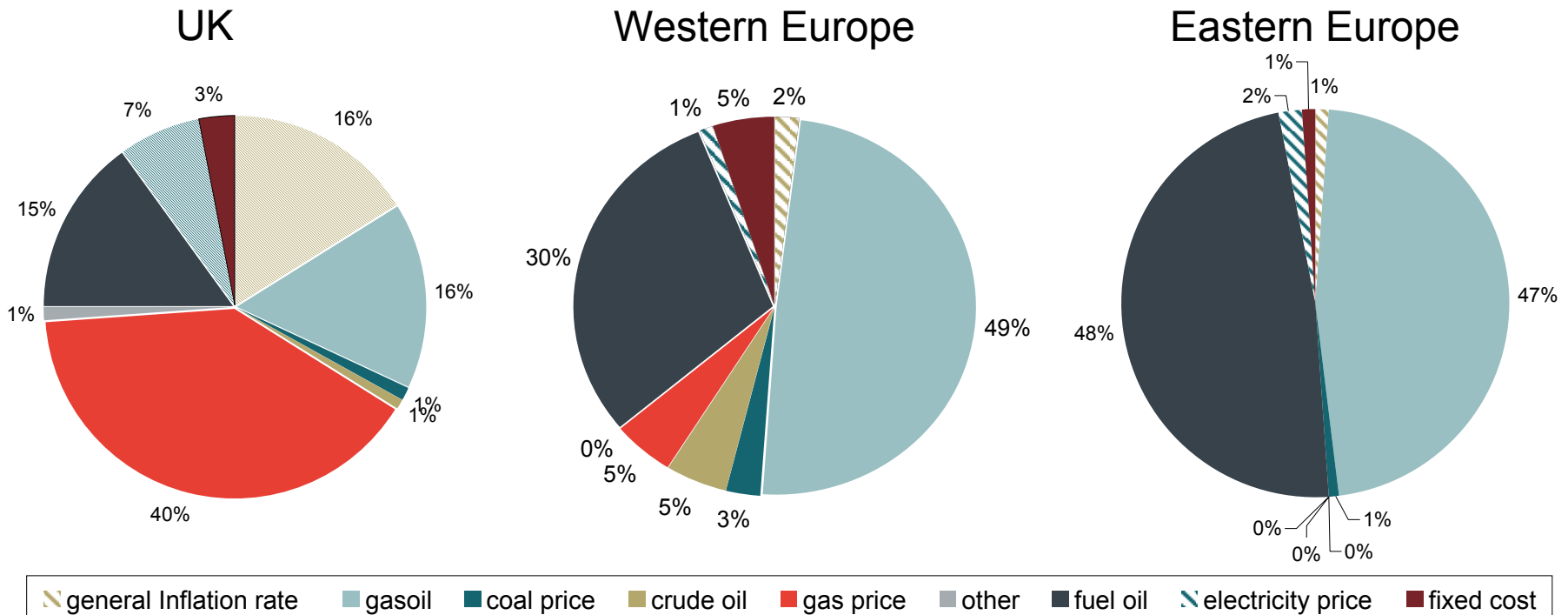
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Vertical supply structures can matter for price formation

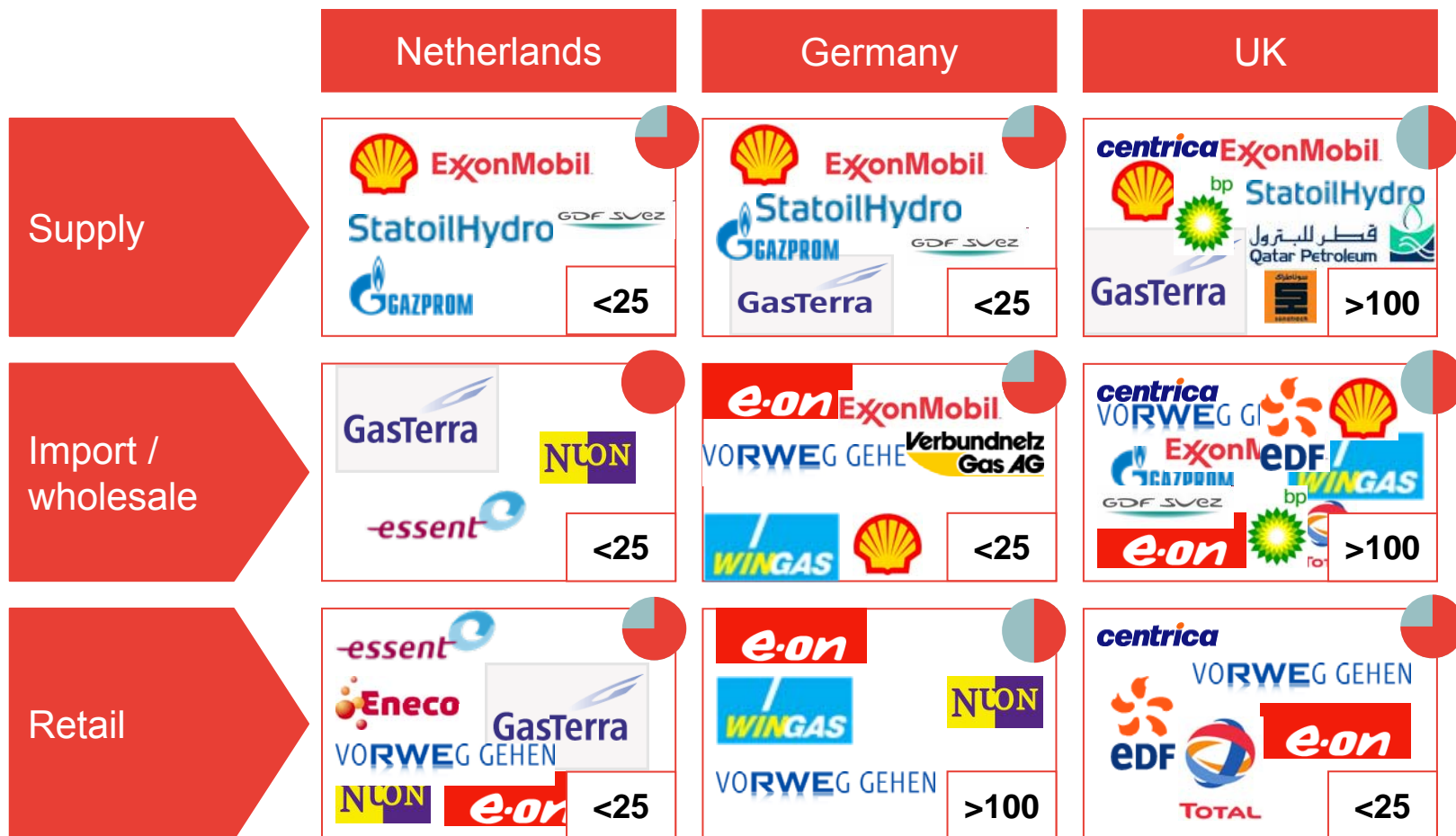


Oil prices dominate price formulas in Europe

- Nearly all European import contracts relate to oil or oil products
- But there are significantly less quota in the UK than in Western and Eastern Europe
- Some new negotiated contracts in continental Europe have higher shares of gas (market) prices in the formulas (e.g. Belgium/Qatar LNG contract)
- Furthermore, the duration of UK contracts is generally shorter (however, some recent import contracts have also very long durations, e.g. LNG from Qatar)



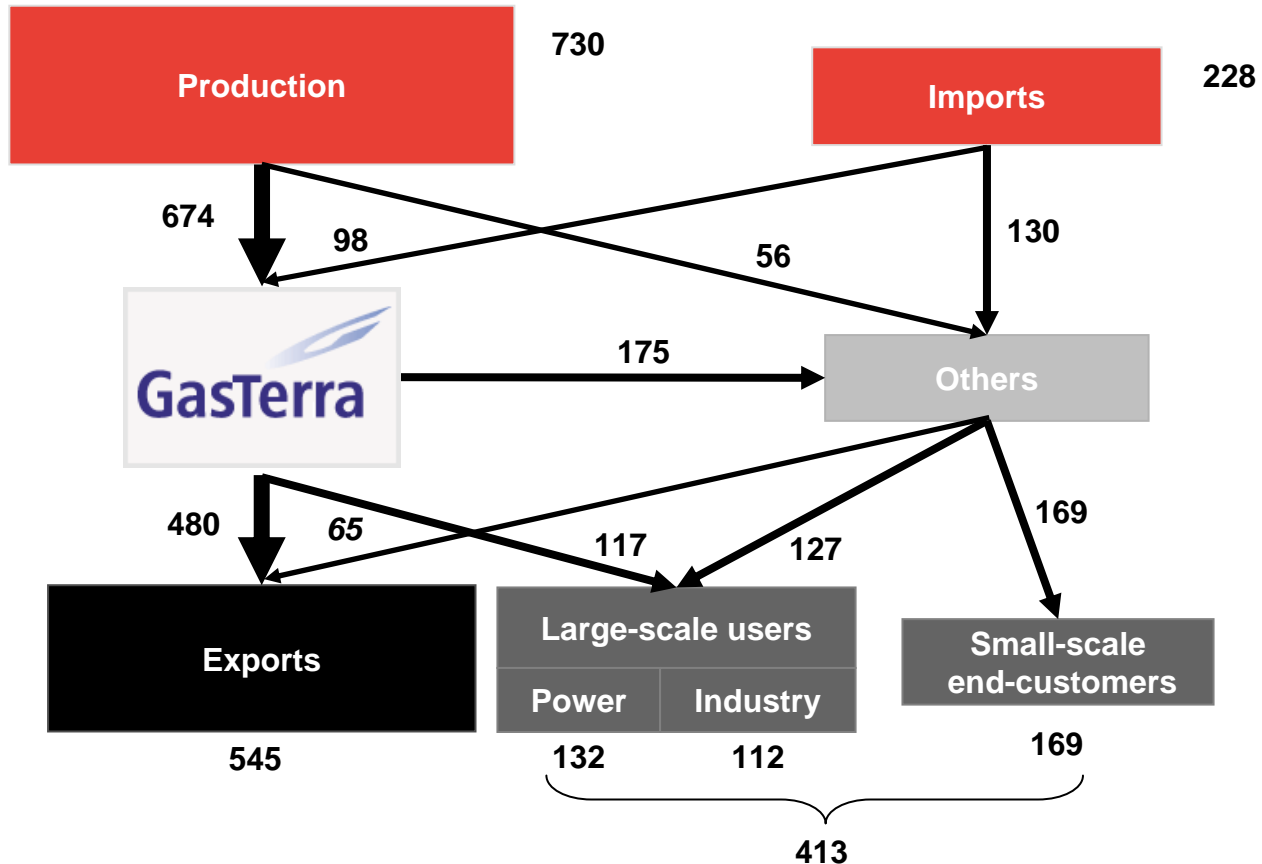
Vertical supply structures vary by country



Market concentration: low / medium / high

▶ Marginal cost of procurement may vary by country

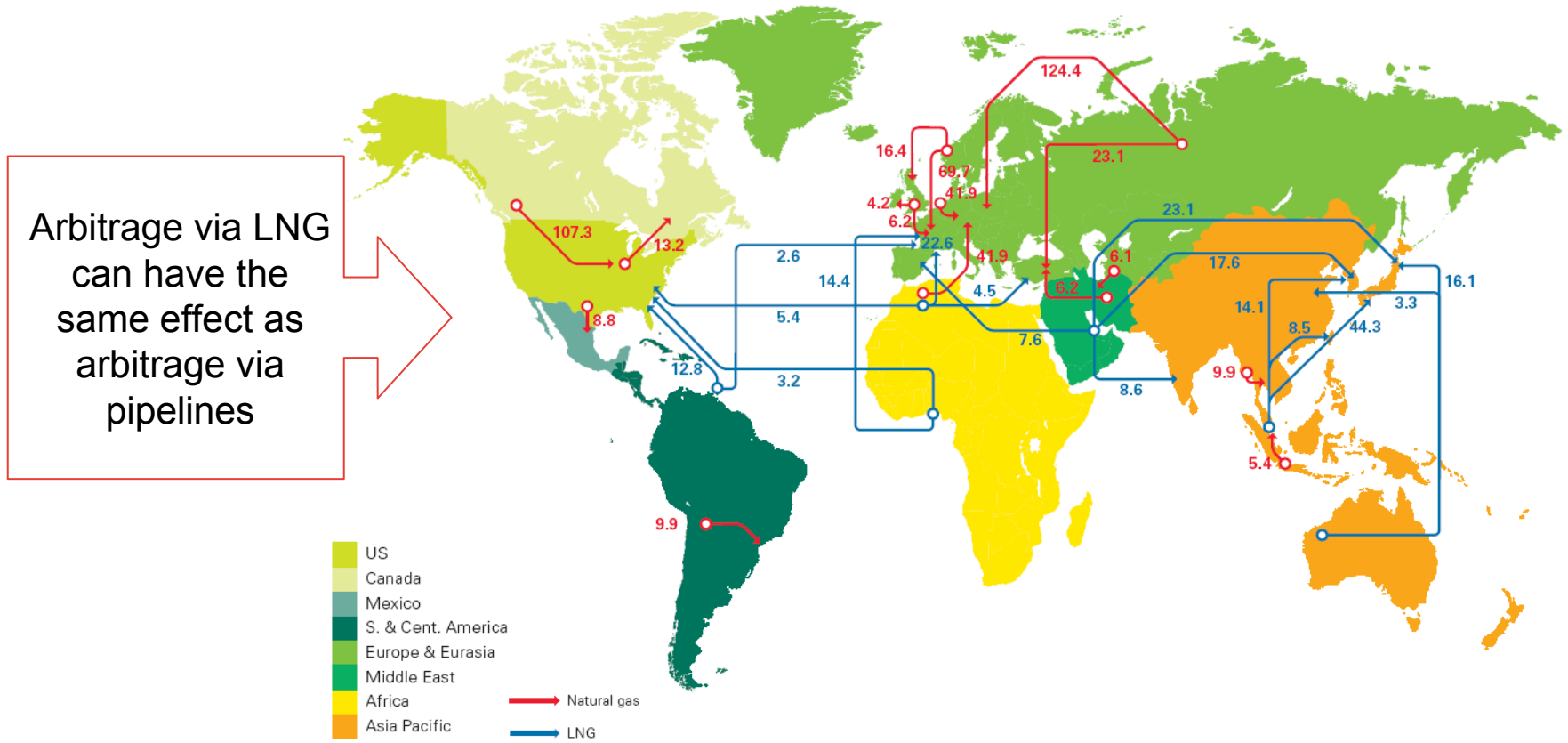
Vertical supply structure in the Netherlands



- Data from 2006 and in TWh/a (some figures are rounded)
- Sources: NMa, GasTerra, IEA, Frontier

LNG: vertical chains and arbitrage opportunities will link gas markets accross continents

Major trade movements
Trade flows worldwide (billion cubic metres)



Source: BP

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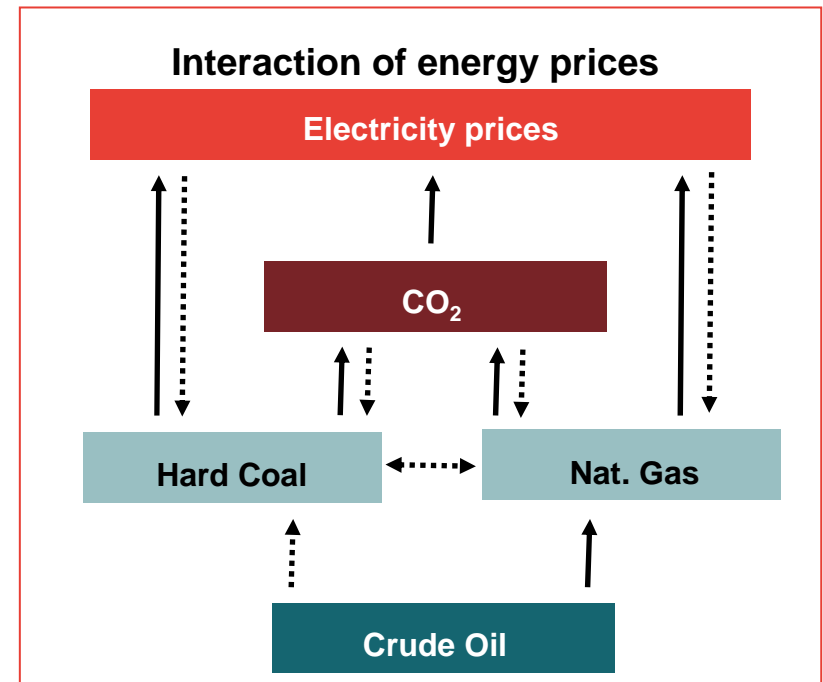
Future drivers of gas prices – we expect energy substitution to remain the key driver

Key logic

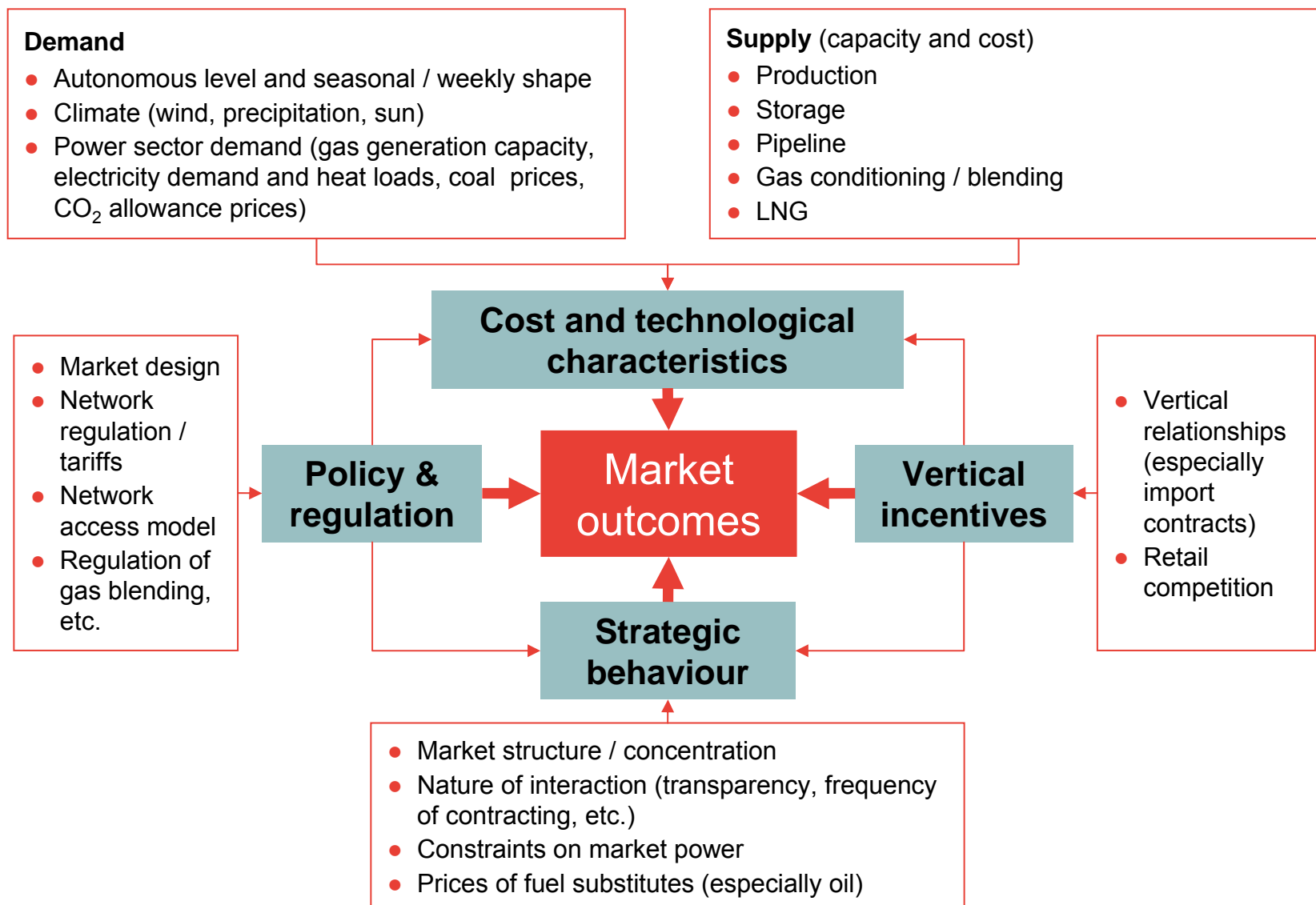
- Long term – fuel substitution (oil, coal) is a key driver of gas prices
- Short term
 - certain fundamentals can destabilise the fuel arbitrage equilibrium in the short term
 - In a more dynamic world (emergence of LNG, demand fluctuations driven by power sector etc.) gas price forecast become more complex

Future role of gas prices?

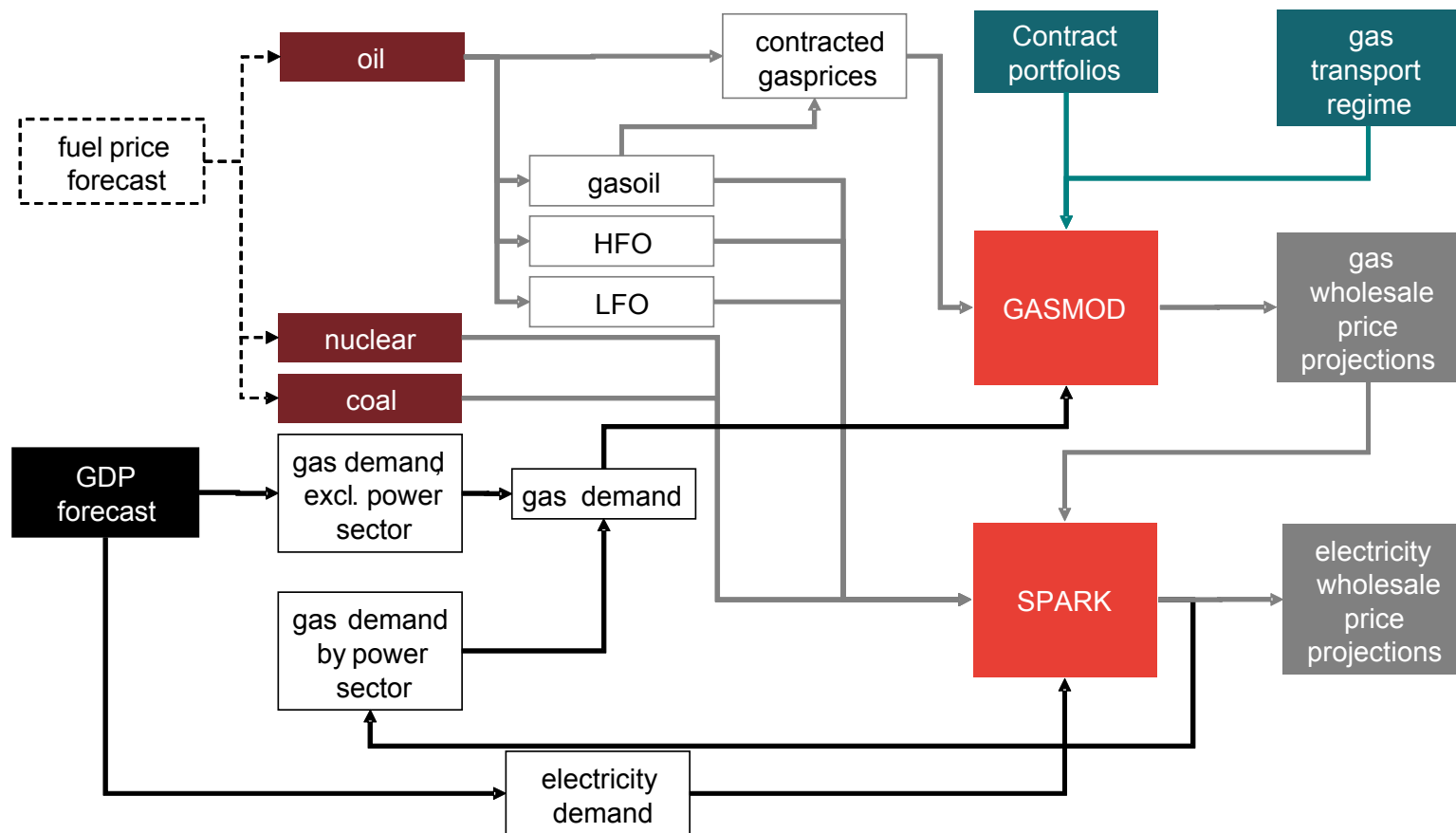
- Which price interactions are relevant?
 - coal / oil / CO₂ / electricity prices
- Which fuel becomes the leader?
 - Could natural gas replace crude oil (or other energy sources) in the long term and become „energy leader“?
 - In the past: fuel switching from
 - wood to coal
 - coal to crude oil
 - We expect that crude oil will remain „energy leader“ in the foreseeable future



Various factors drive the gas wholesale prices



Complexity of gas price forecasts increases - e.g. integrated models for electricity/gas markets are essential



Source: Frontier

Fluctuations in future gas prices will be strong - but always traceable

To be expected (from our point of view):

Short-term

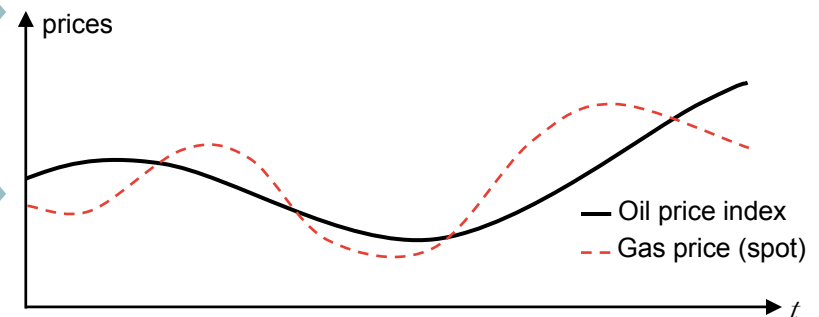
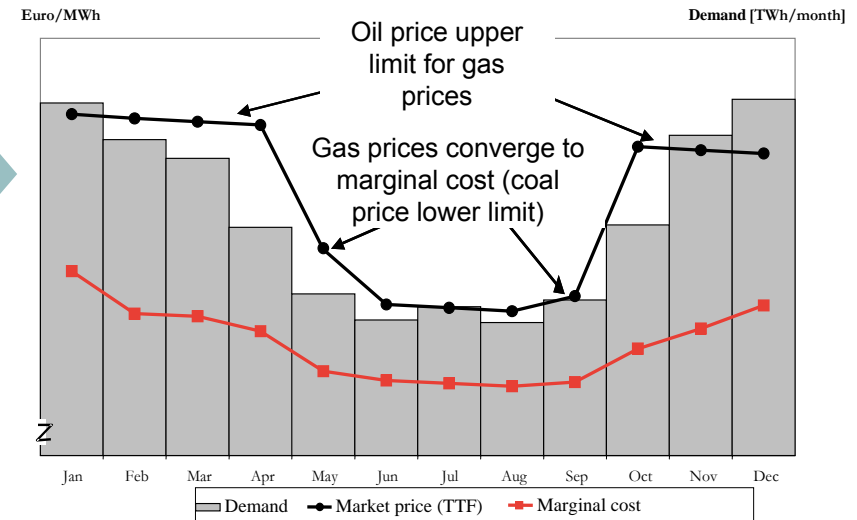
- Seasonality of the gas price
- Reaction to short-term market developments

Mid-term

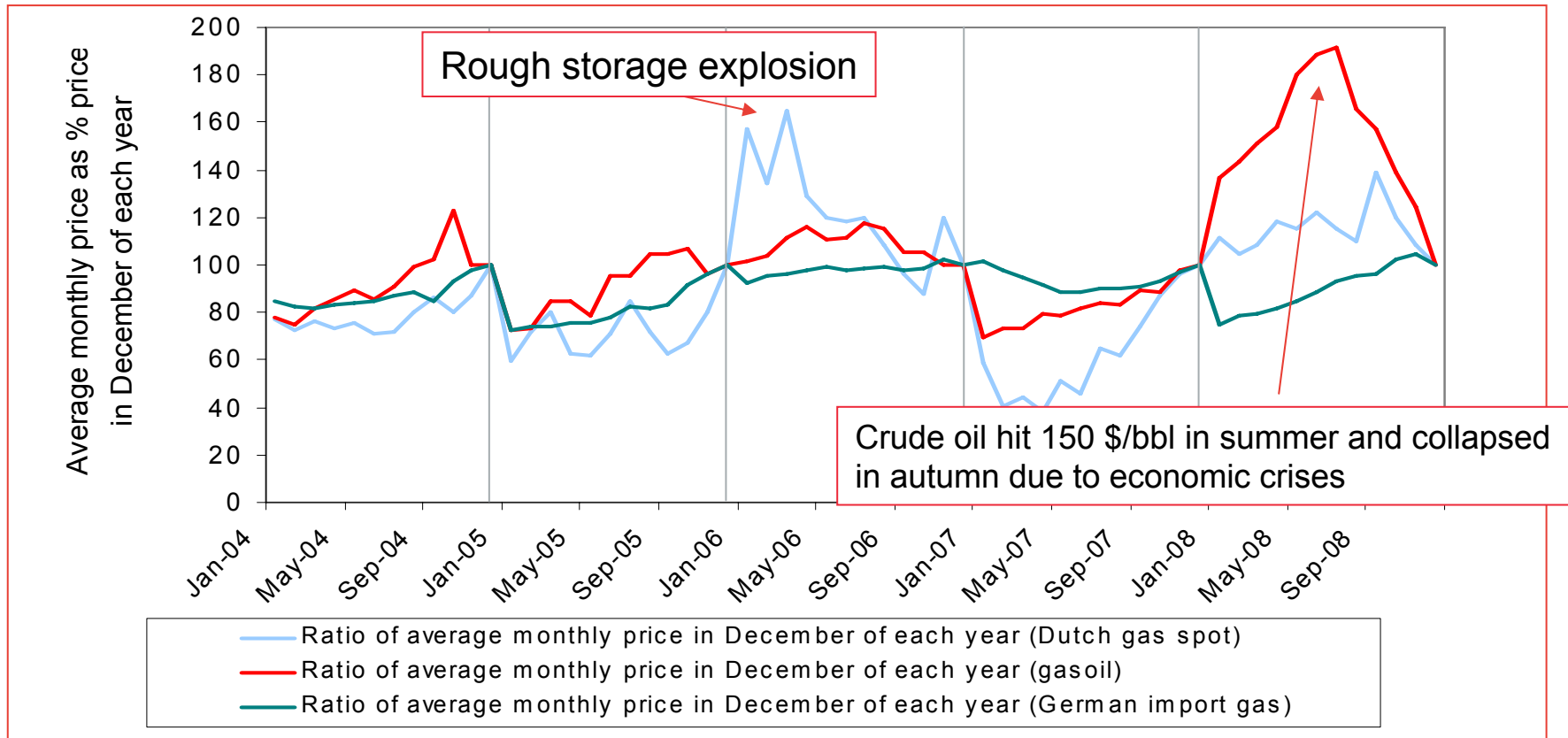
- Seasonality of the gas price
- Fluctuations around the prices for energy substitutions
- Market scarcity (supply side) influences gas price

Long-term

- Gas price development is consistent with prices for energy substitution



Seasonality of oil and different gas prices vary



Source: BAFA, Stat. Bundesamt

- No deterministic seasonal pattern for price profile of gasoil
- Therefore also oil-indexed import gas has a flatter price structure
- In contrast spot prices are more volatile than price sin long-term contracts as they reflect more adequate short-term supply and demand situation

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Three components are relevant for suppliers costs - and retail prices (examples for NL)

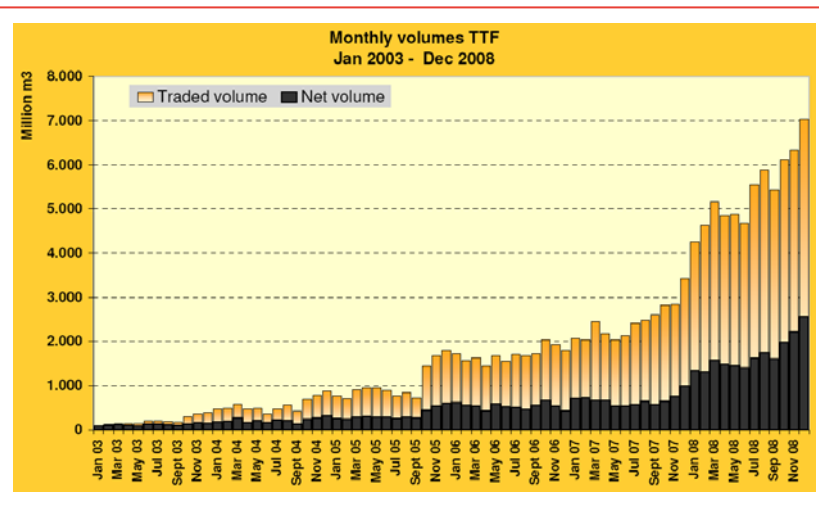


- Supplier needs access to gas, which could be sourced by
 - Imports
 - Production (own or purchases from producers)
 - Virtual Trading Points or hubs in NL or abroad
 - Bilateral contracts with other suppliers (e.g. GasTerra)
- Supplier needs access to regulated services*
 - Entry and exit capacities
 - Cross-border capacities (optional)
 - Quality conversion (optional)
- Depending on customer's profile more or less flexibility is needed
- Some commodity sources may already have some flexibility included (e.g. contracts with ToP), others not
- As GasTerra doesn't sell flexibility as a product on its own, especially storage capacity is needed by suppliers

Access to pure commodity appears to be sufficient

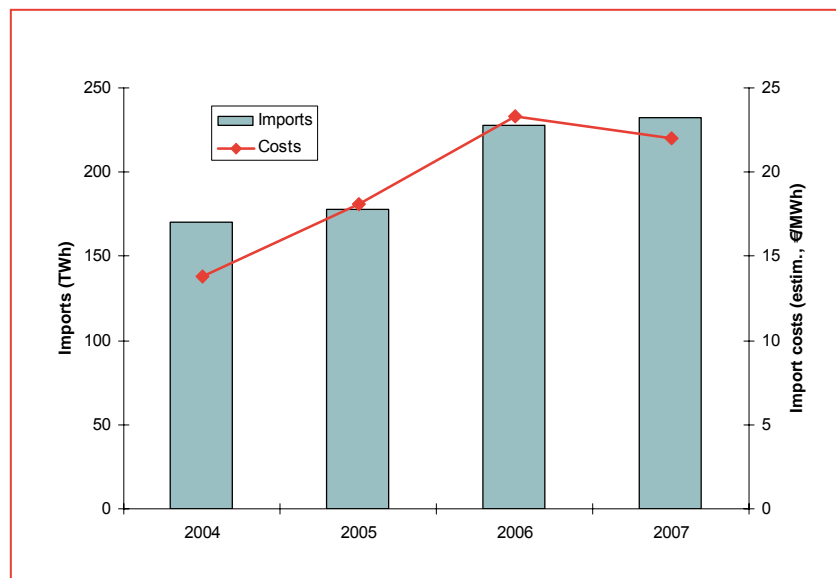
TTF

- Liquidity on TTF increased significantly in recent years
- Product variety developed and prices become a more valid benchmark
- However, the role as procurement option is limited to H-gas segment



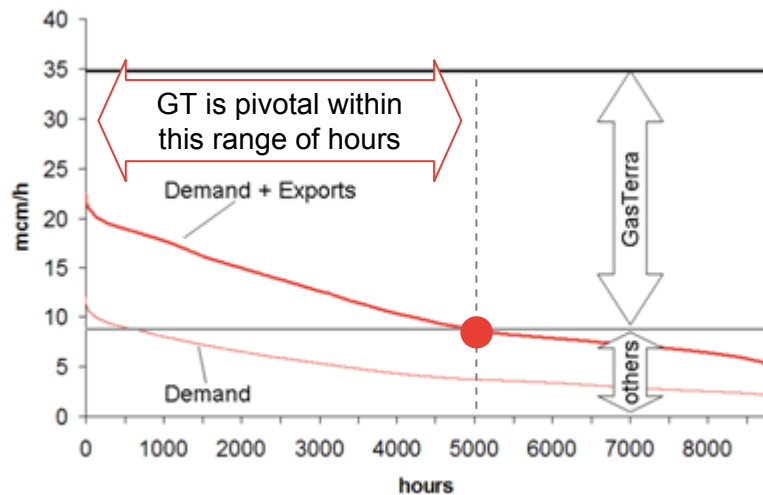
Imports

- Imports rose in recent years which reflects decreasing reserves in the Netherlands
- Also more parties use this option to become more independent from GasTerra
- New pipeline connections pushed role of Netherlands as “gas roundabout” in NW Europe
- Rotterdam LNG terminal under construction will enforce this position furthermore

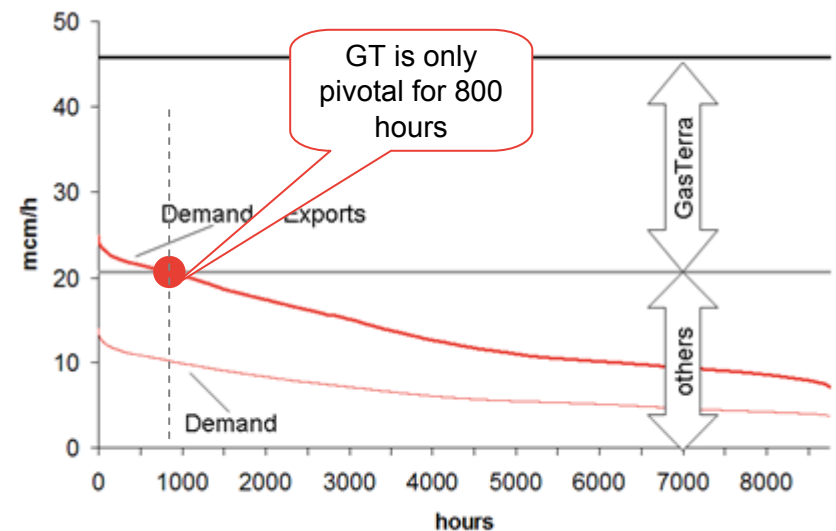


GasTerra's role in the Dutch flexibility market is still dominant, but will decline over time

2006 (estimate)



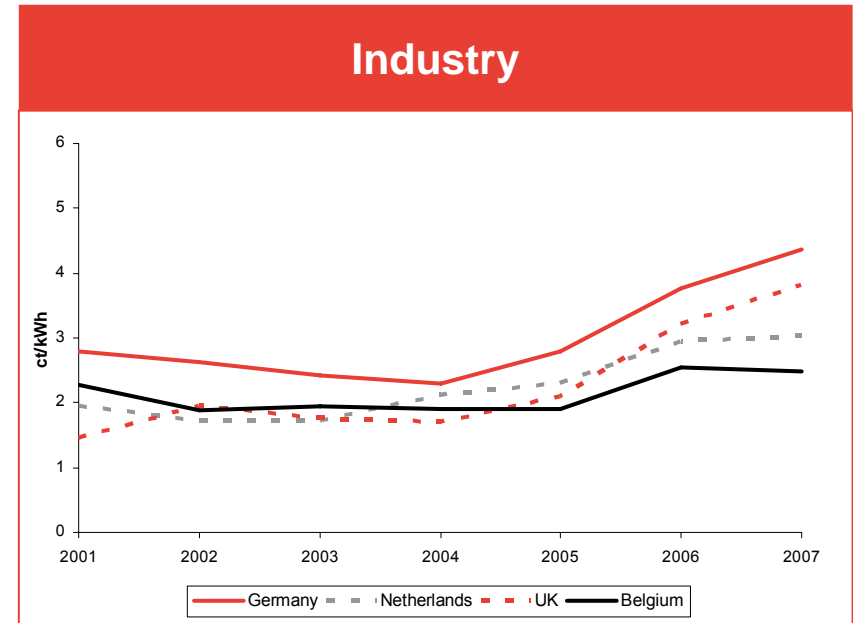
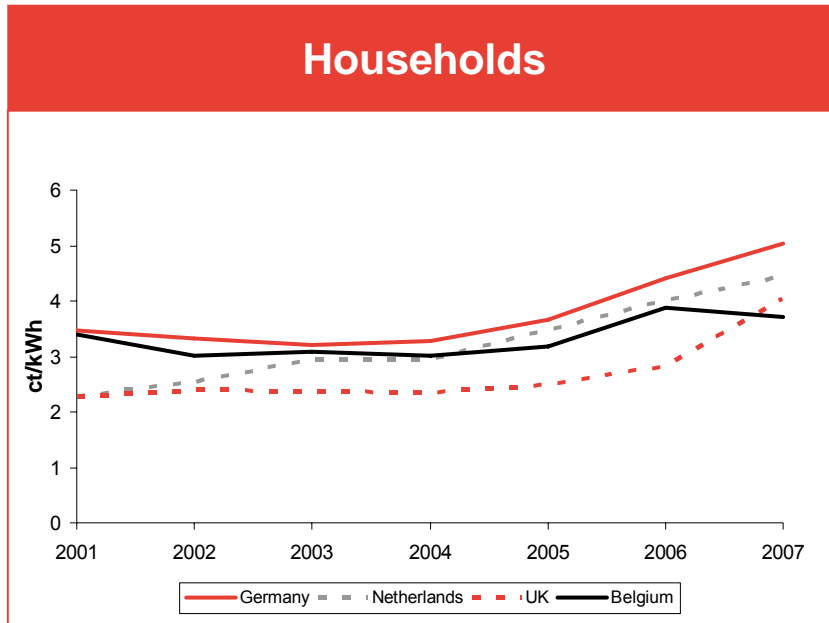
2011 (projection)



Source: Frontier

- The number of hours in a year for which GasTerra is pivotal declines over time
- In the combined L-gas and H-gas market it declines from 5000 hours in 2006 to 800 hours in 2011
- GasTerra will be dominant in gas flexibility throughout the period 2006 to 2011

Test 1 - Dutch retail prices are comparable to those in bordering countries



Note: prices without taxes

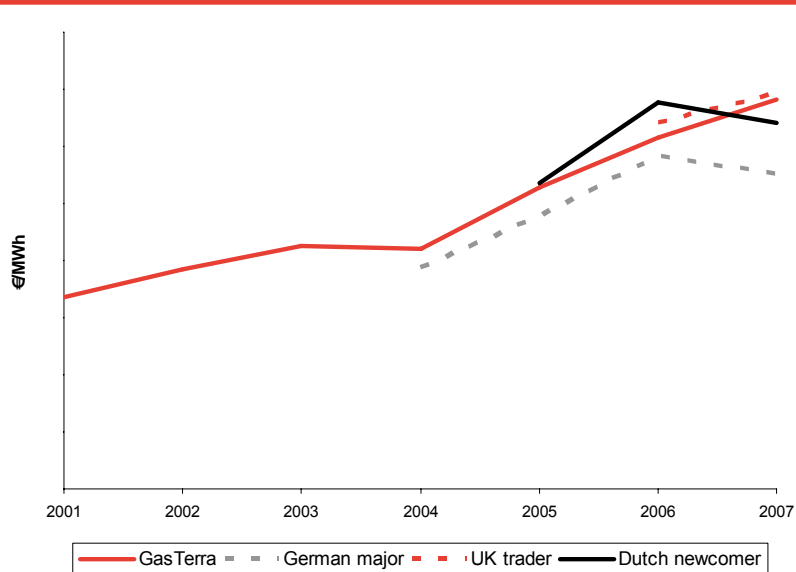
Source: Eurostat, GasStrategies, Argus

However:

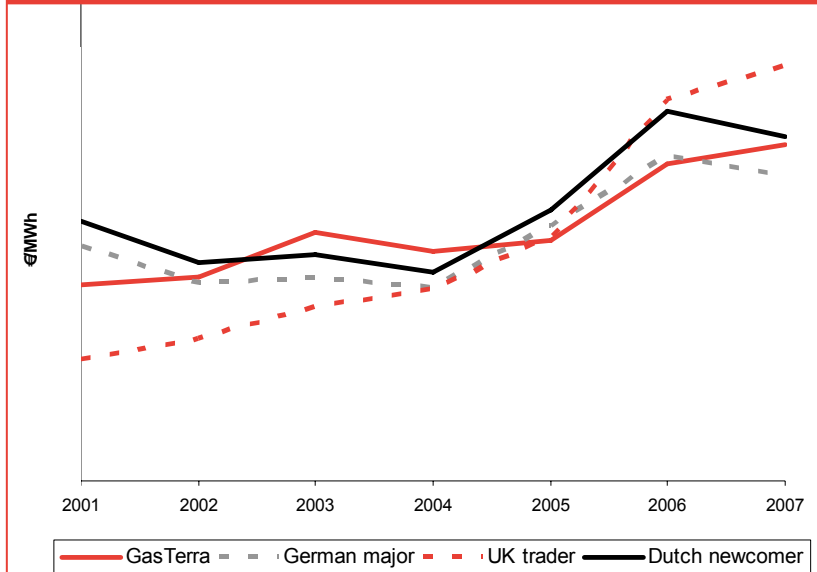
- Eurostat sometimes delivers inconsistent and unreliable data series
- Transport and flexibility tariffs vary significant along (or even within some) countries which impacts price levels significantly
- In addition, those reported average prices doesn't provide a clear view of adequacy of price as for example market structure and procurement sources may vary along the country – as shown before

Test 2 - GasTerra prices have been within the range of benchmark prices

Small-scale end users



Large-scale end users

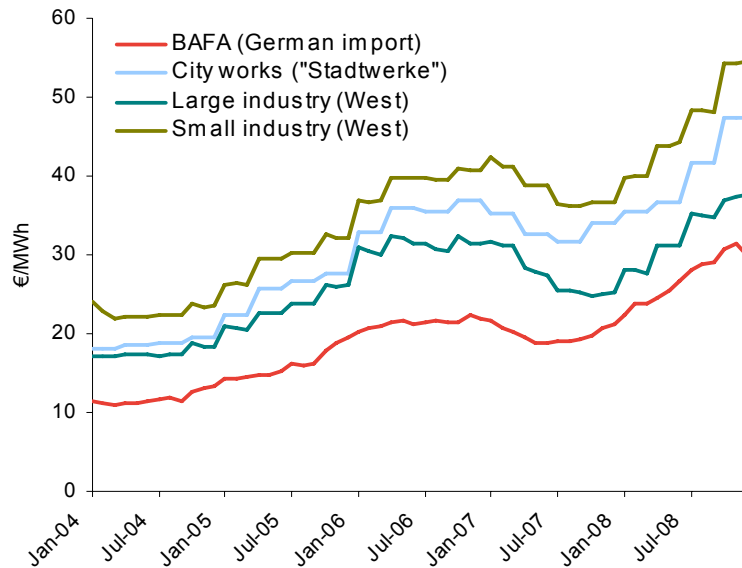


Methodology

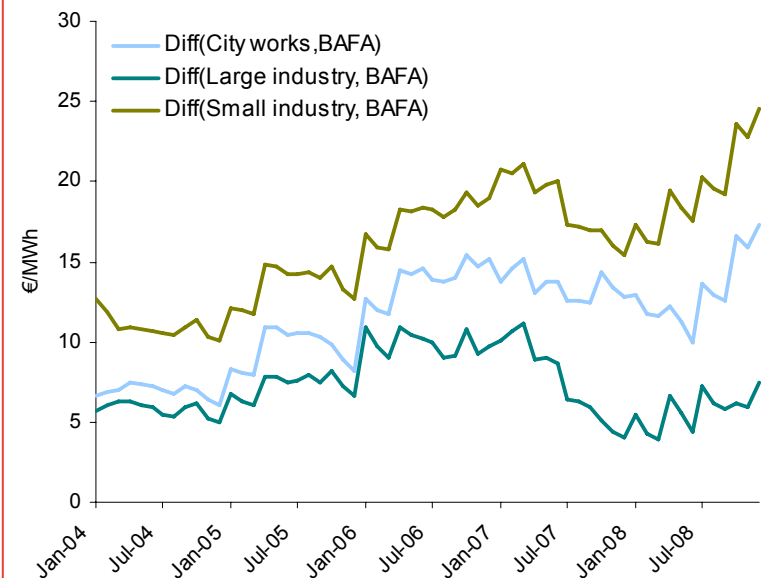
- Incumbents prices could be benchmarked against hypothetical competitors
- To avoid misinterpretations both competitors and standard customers have to be designed very carefully
- Competitors have different supply paths to customers, consists of different procurement strategies, transport ways and flexibility sources
- Customers are defined by parameters like demand volumes, peak hour demand or gas quality

Germany - Downstream prices for city works and industry show same trend

Sectoral gas prices



Retail margins



- In pricing regimes with oil indexed prices, import and downstream prices are significant in line
- In recent years absolute margins especially for small-scale customers (small industry and city works) rose, whereas large industry is to some extent decoupled
- However, in the long-run ratios (or relative margins) of downstream to import prices are more or less stable, with some more fluctuations industrial customers

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