

A large, light blue, stylized flame graphic on the left side of the slide, composed of several curved, overlapping shapes that resemble flames or gas flow.

Price Envelopes for European Gas

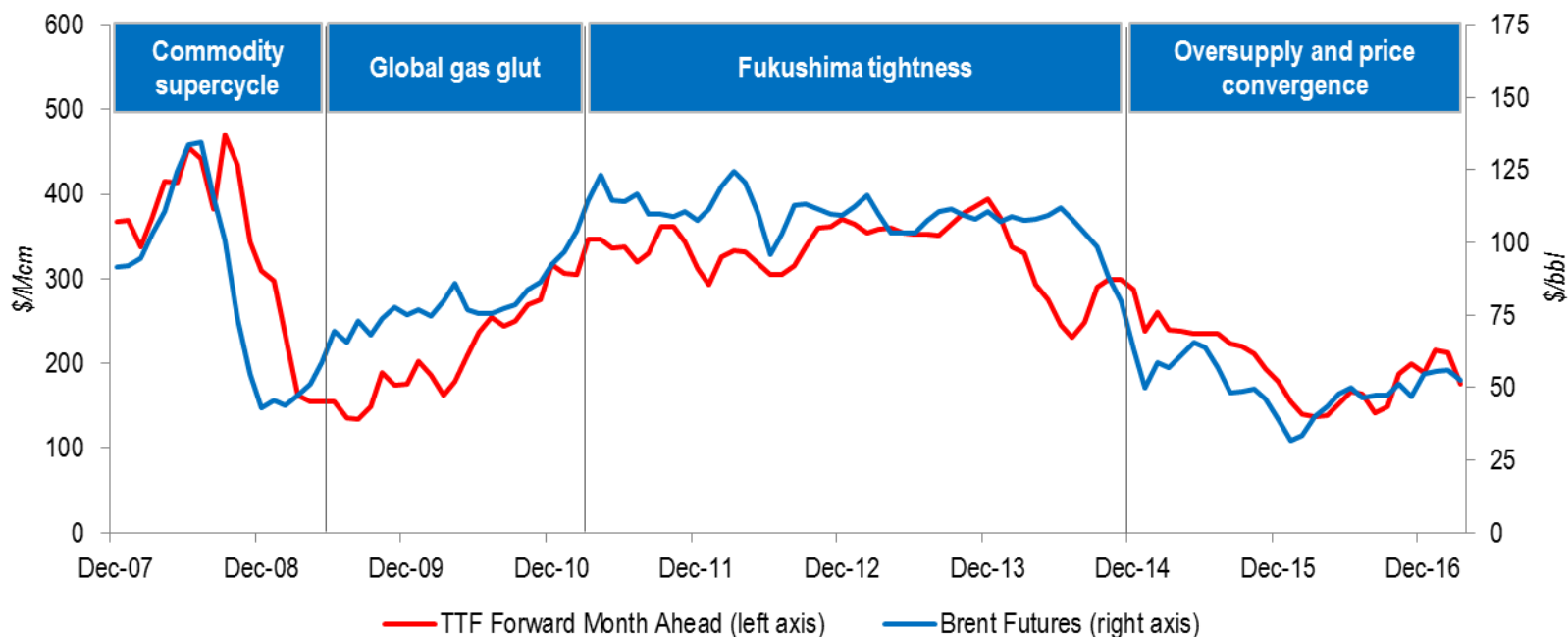
Sergei Komlev

Head Contract Structuring and Price Formation Directorate
Gazprom Export*

Flame,
Amsterdam , May 8, 2017

*Views expressed in this presentation are the author's sole responsibility
and do not necessarily represent that of Gazprom Export

Market Tightness is Inadequate Criteria for Division of European Gas History into Periods

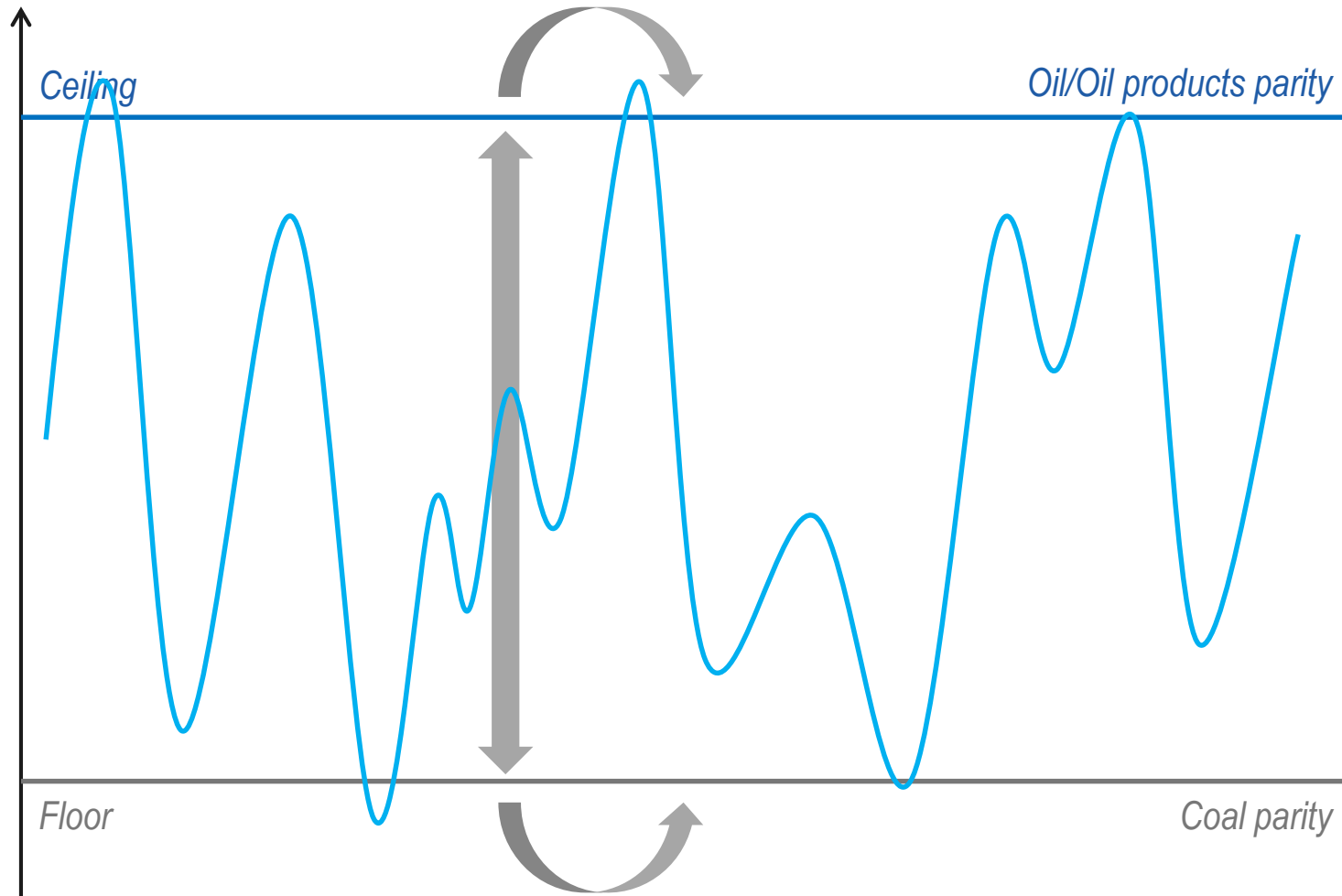


Source: Adapted from Timera Energy

- 1) 'Global gas glut' (Jun '08 – Dec '10) only strengthened European gas prices despite the LNG flood. European gas prices just followed oil price recovery prior to Fukushima.
- 2) 'Fukushima tightness' (Mar '11 – Dec '14) gave no special momentum to gas price developments: erratic fluctuations of gas prices completely ignored outflow of large LNG volumes from Europe.
- 3) 'Oversupply and price convergence' (Dec '14 – current): although gas prices start to weaken prior to September 2014 due to abnormally warm Q1 2013, their collapse coincided with oil price drop on the market which has already rebalanced itself.

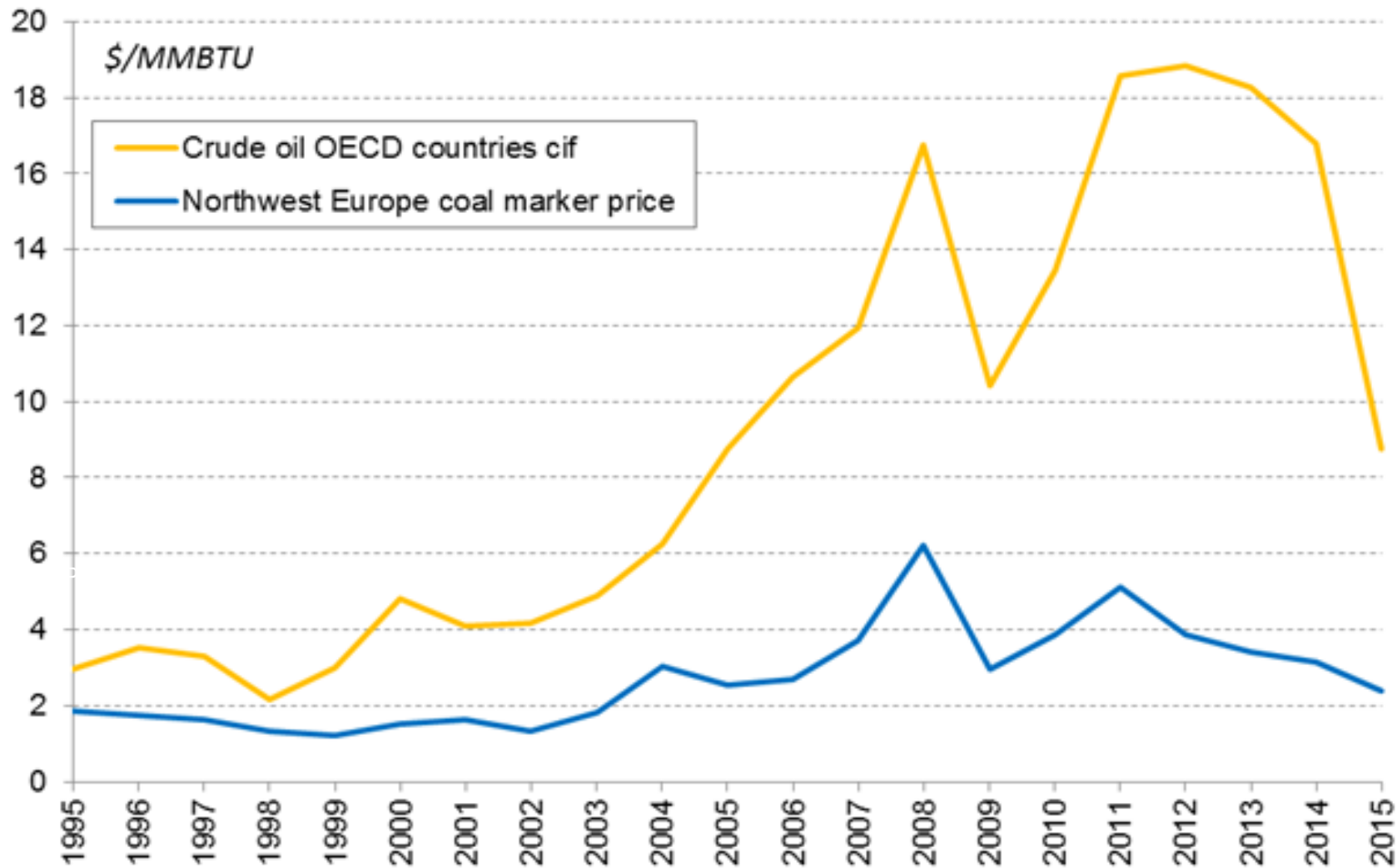
Use of market tightness indicator for periodization of European gas history creates parallel reality. It drives to an absurd conclusion that oversupply leads to higher prices.

Inter-Fuel Competition Defines Upper and Lower Price Range Levels for Natural Gas



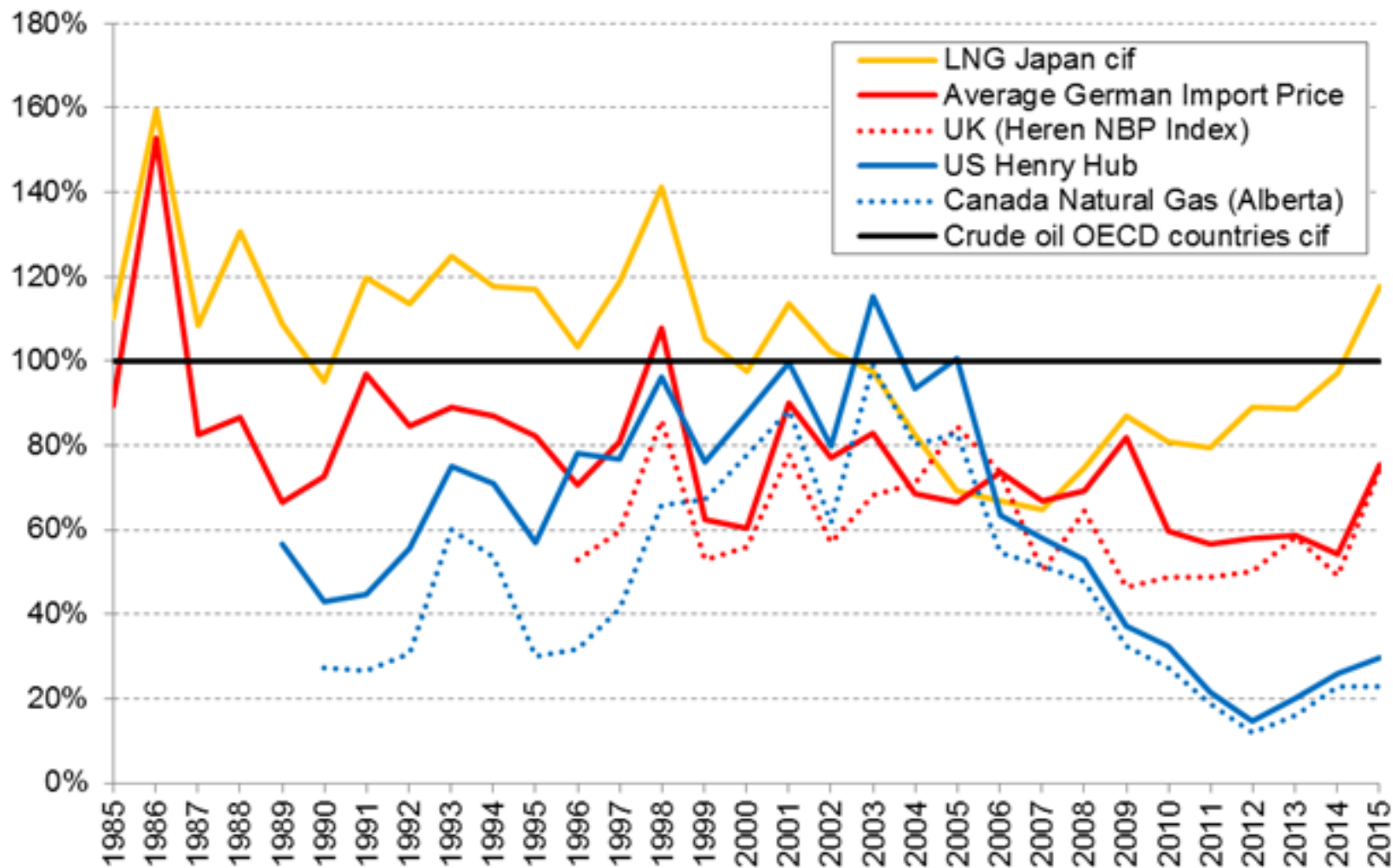
Source: Gazprom Export

Gas Price Corridor Width is Determined Mainly by Oil Price Volatility and Stretched from 0.8 MMBTU in 1998 to 15 MMBTU in 2012



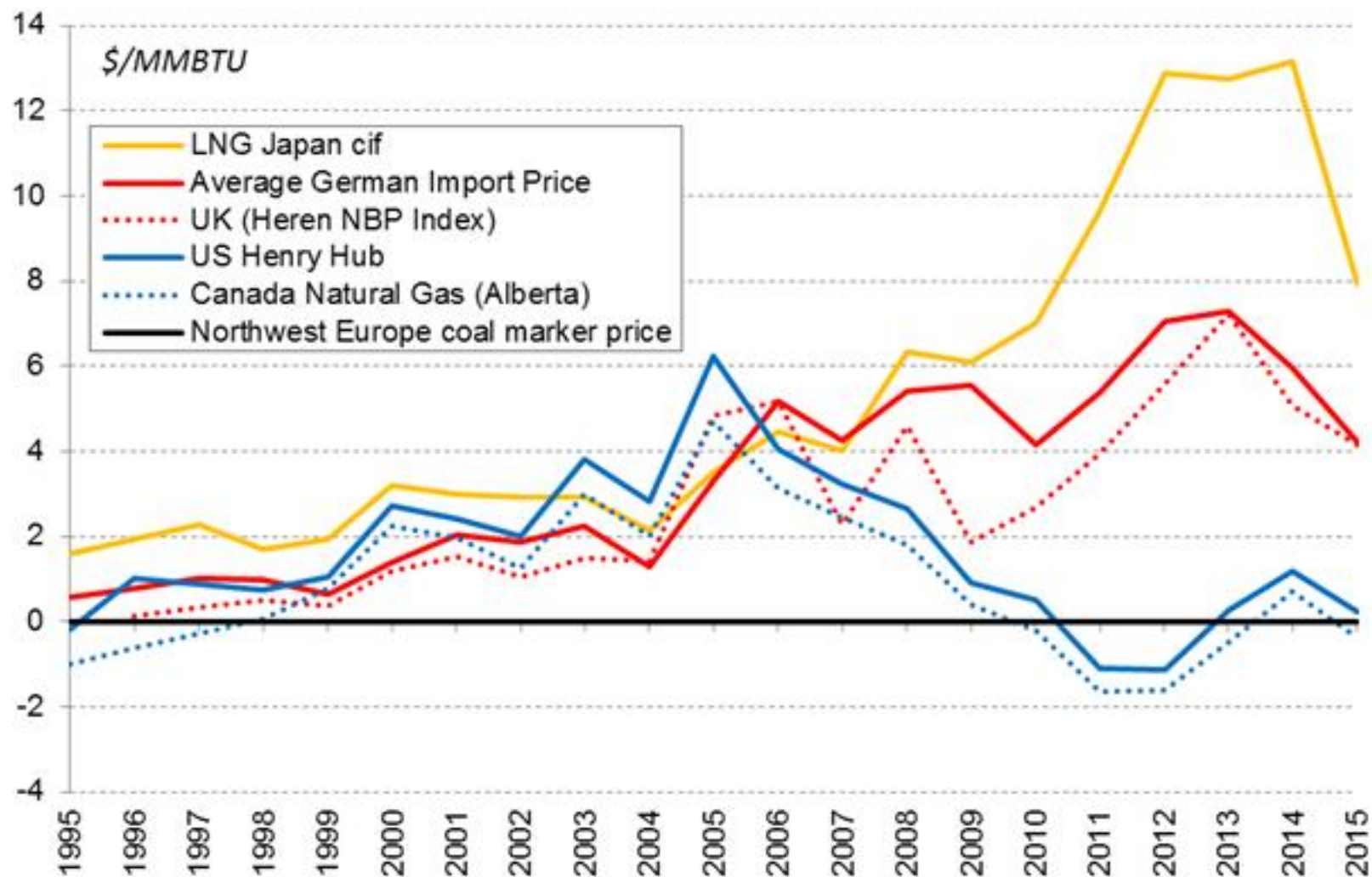
Source: BP, Gazprom Export

Oil Price Sets a Resistance Level for Natural Gas Prices



Source: BP, Gazprom Export

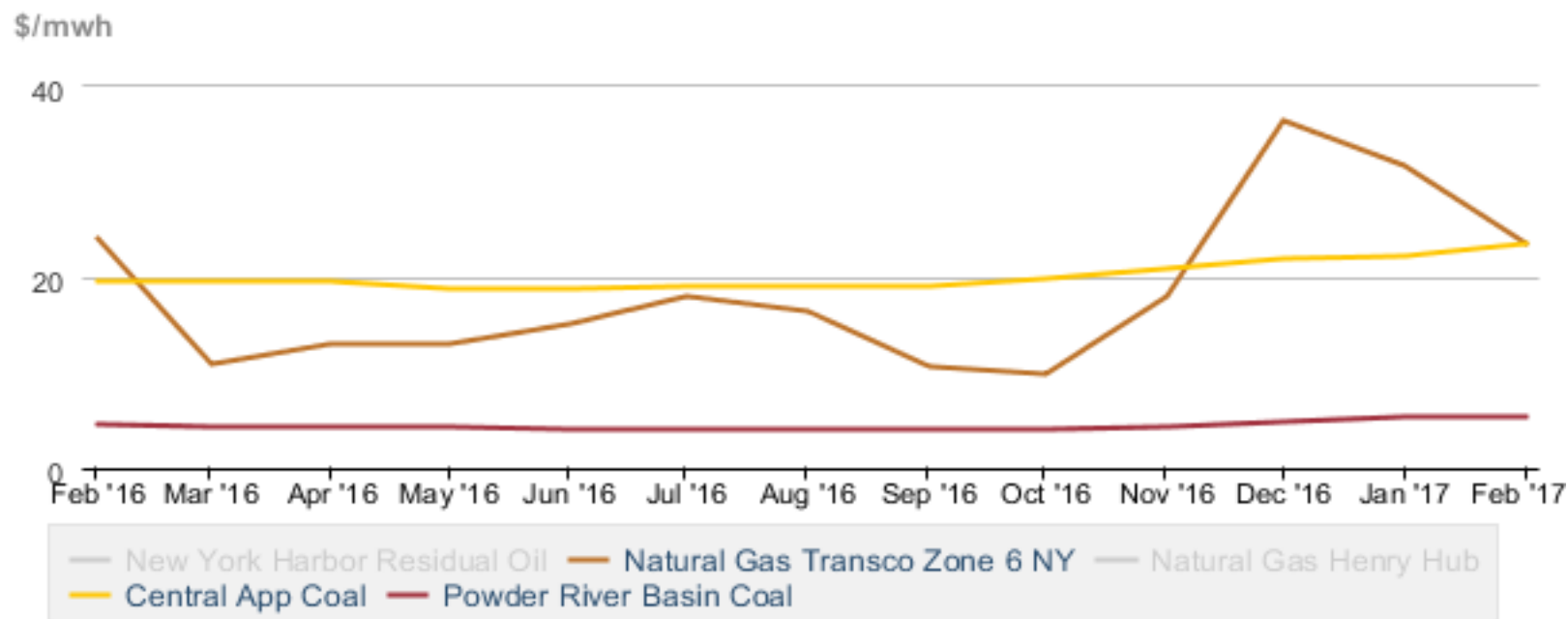
Coal Price Sets a Support Level for Natural Gas Prices



Source: BP, Gazprom Export

Depressed NA Natural Gas Prices are Competitive with 'Expensive' Grades of Coal Only

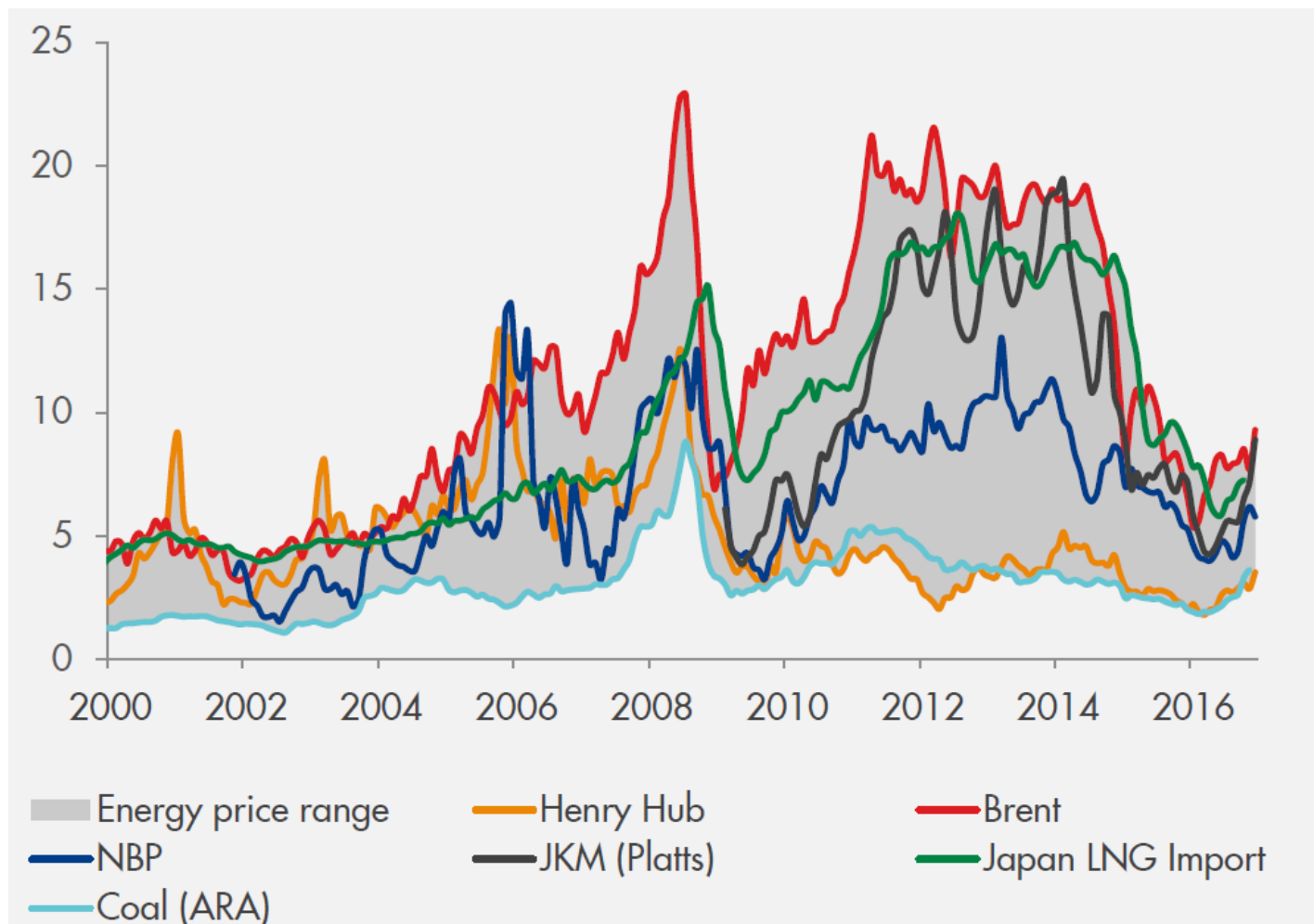
Average fossil fuel spot prices (\$/MWh), February 2016 – February 2017



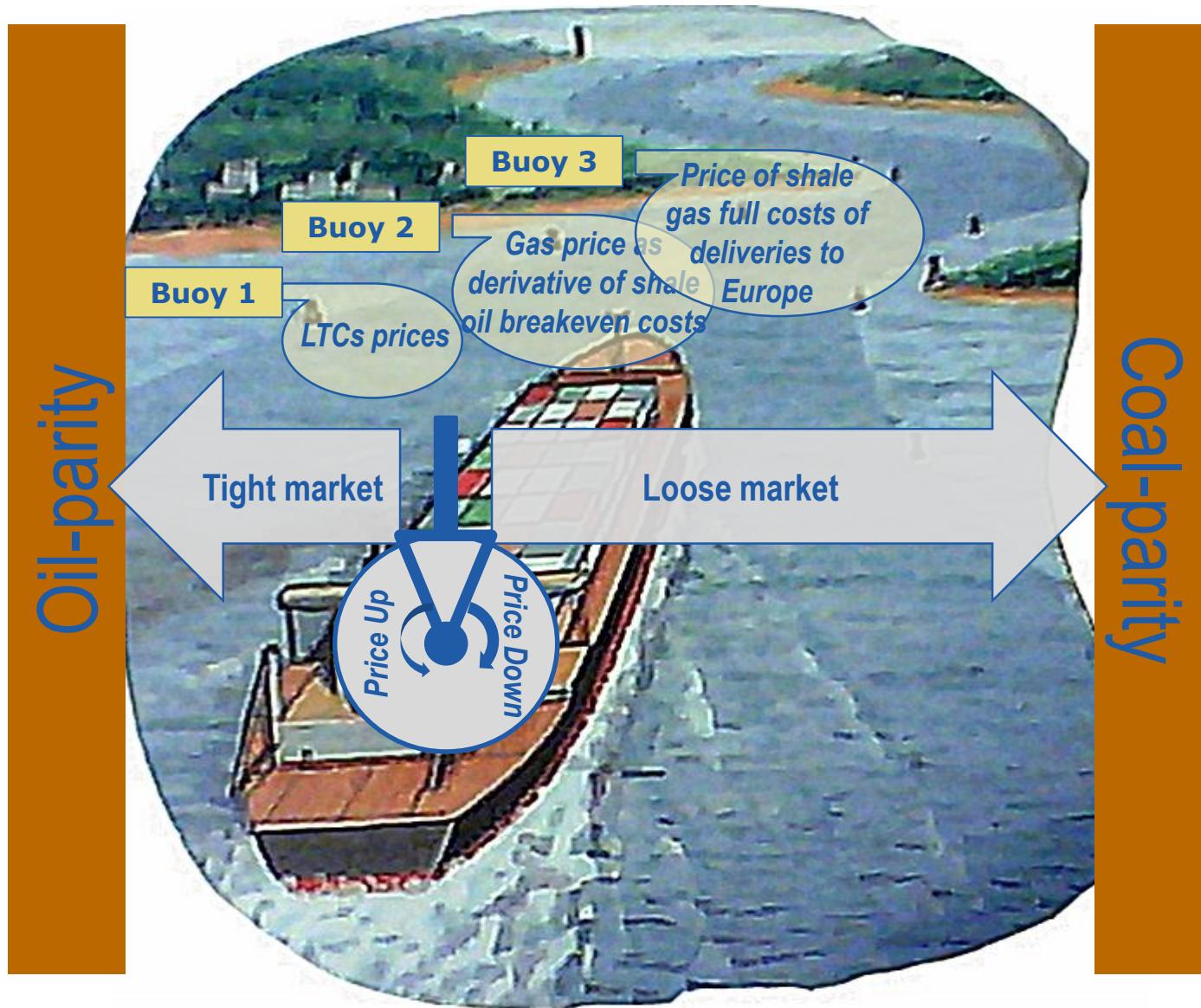
Source: U.S. Energy Information Administration derived from Bloomberg Energy

* Coal and natural gas prices compared on an equivalent energy content and efficiency basis

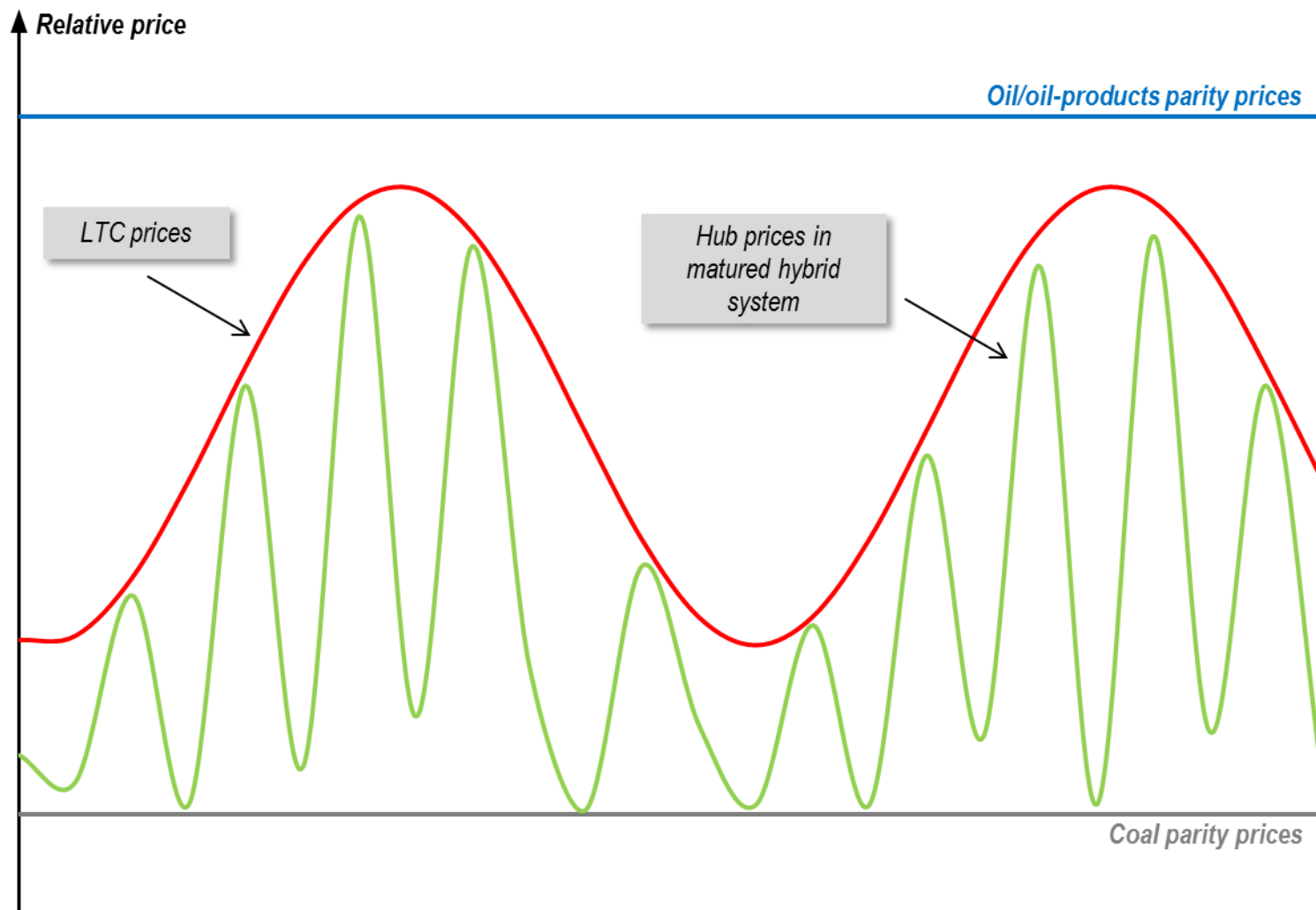
Competition with Other Hydrocarbons Locks Natural Gas in Price Envelope



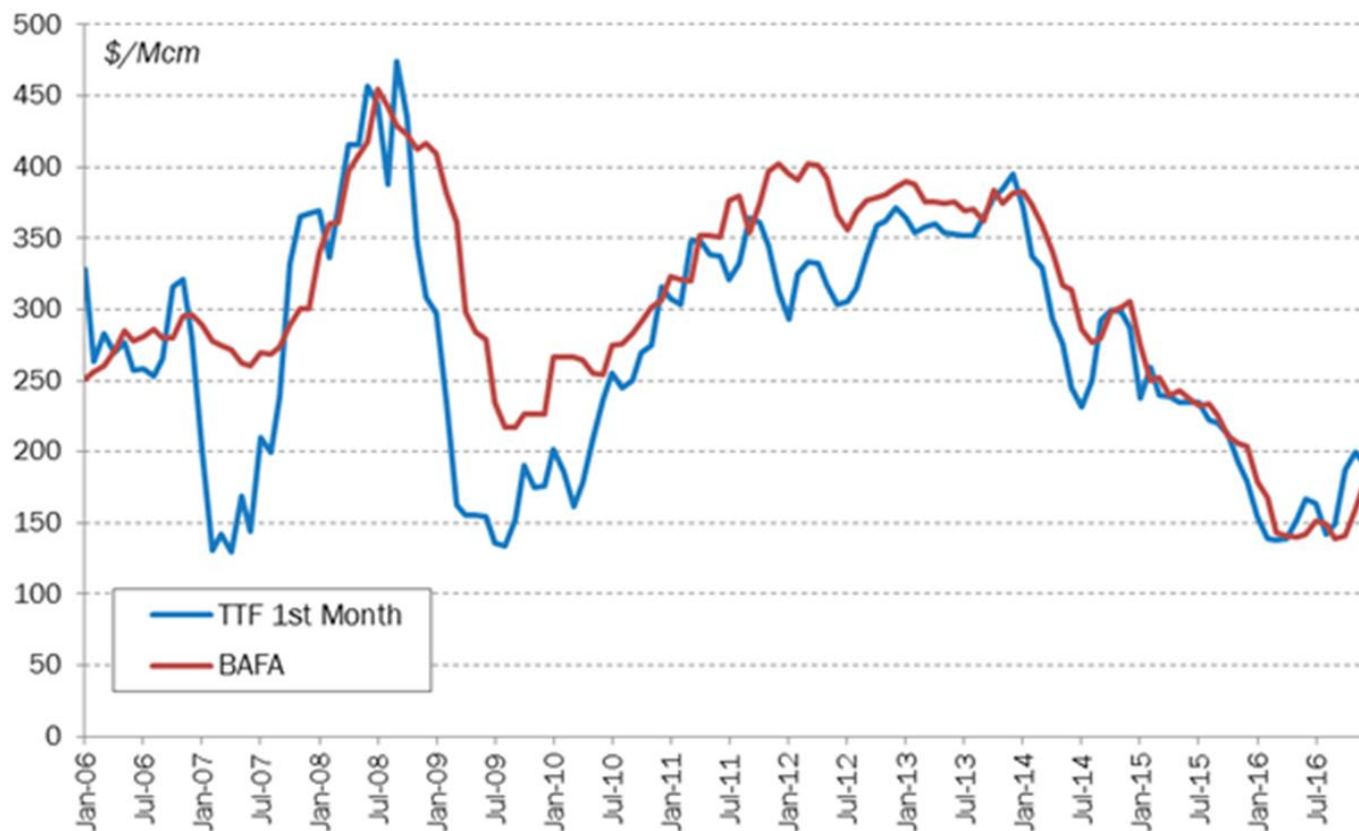
Hub Natural Gas Price Navigation in Europe



Bouy#1. Prices of Long-Term Supply Contracts set a Strong Resistance Level for Hub Prices in Europe



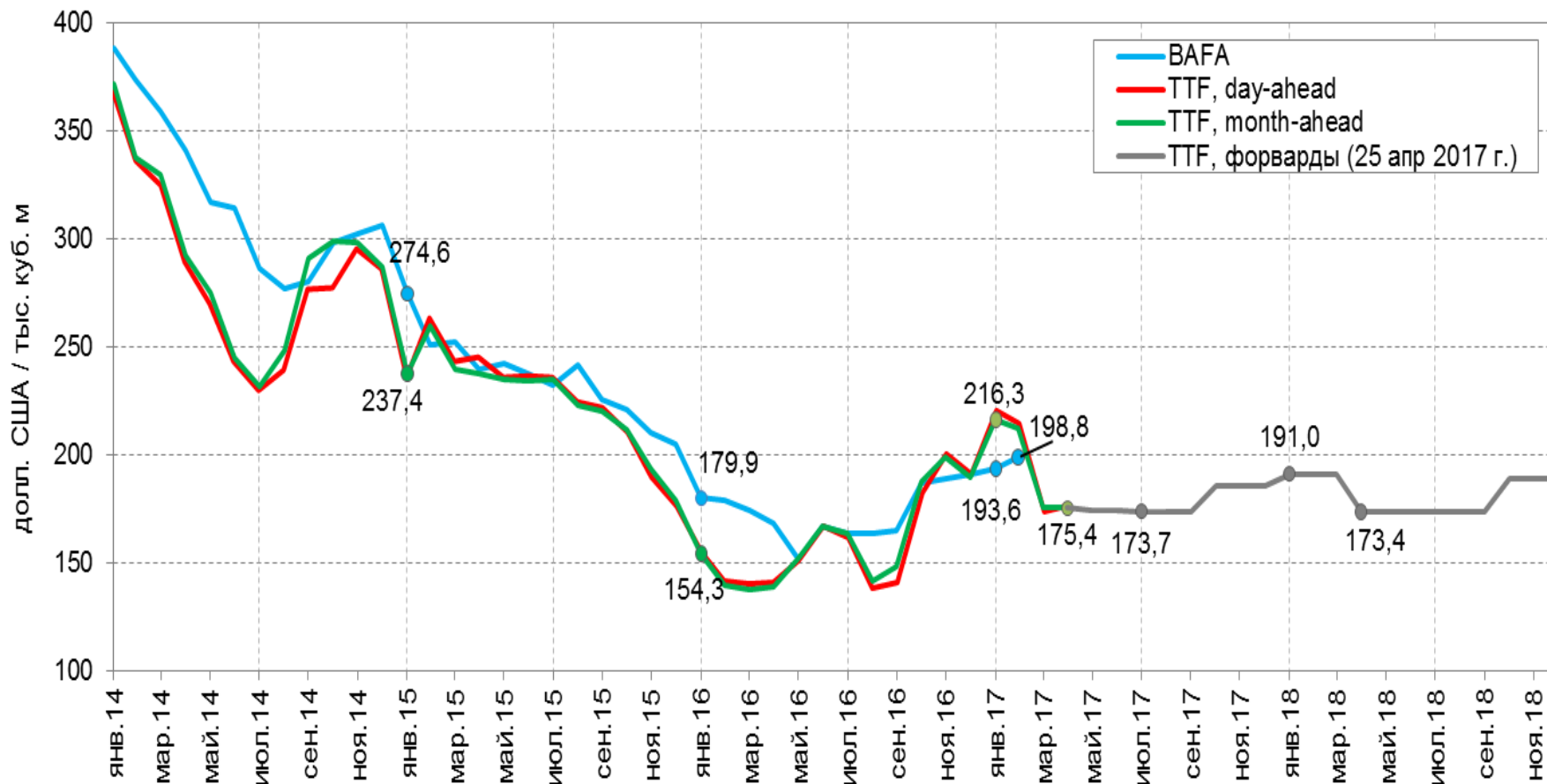
Bouy #1. Hub-Based Gas Prices in Europe Move in Tandem with Oil/Quasi Oil-Indexed Contract Prices



Even if oil-indexation elements are being substituted by hub ones, prices of LTCs exercise strong influence over hub prices and are setting up a trajectory for their movement by acting as "price anchor". Hub prices are therefore not independent: they are derivatives of the contract prices that set a baseline trend for their behavior. Supply and demand only mutate their changes

Source: BAFA, Bloomberg, World Bank

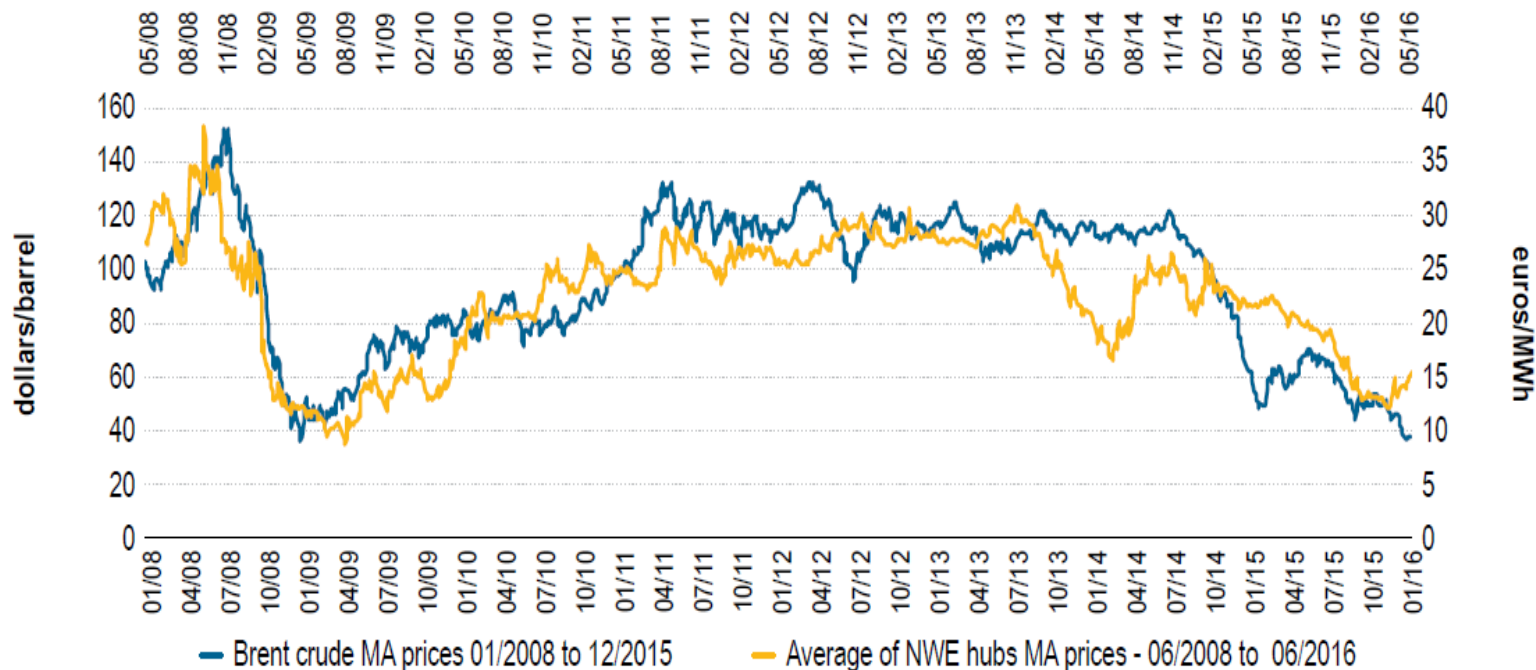
Bouy #1. Extreme Weather Conditioned Pushed TTF Prices above BAFA for Nearly Two Months



Source: BAFA, Bloomberg

Bouy#2. ACER 2016 Report: Correlation between Oil and Gas Prices is High

Figure 20: Oil and gas hubs price evolution in Europe – 2008–2015



Source: Platts (2015) and ACER calculations.

Note: A six-month forward-lag is used for gas in the comparison with oil prices, which is the usual practice in the indexation formulas of gas long-term contracts.

Bouy #2. Correlation and Regression Analysis Indicates that TTF Price Dependence on Oil Prices is Increasing

| Correlation (TTF MA, USD/mcm) | Time period | Brent, USD/barrel | Oil Price: Six month moving average | Oil Price: Nine month moving average |
|-------------------------------------|-------------|----------------------|--|---|
| | 2008-2016 | 76.6% | 85.5% | 83.3% |
| | 2008-2013 | 69.9% | 84.7% | 81.9% |
| | 2014-2016 | 79.5% | 87.3% | 88.7% |
| R Squared (TTF MA, USD/mcm) | 2008-2016 | 58.6% | 73.1% | 69.4% |
| | 2008-2013 | 48.9% | 71.8% | 67.1% |
| | 2014-2016 | 63.2% | 76.3% | 78.6% |

This effectively means that NA shale breakeven costs which emerged as the major determinant for global oil prices are setting price range for European hub prices

Bouy#3. Full Costs of NA LNG Deliveries to Europe

\$/MMBTU

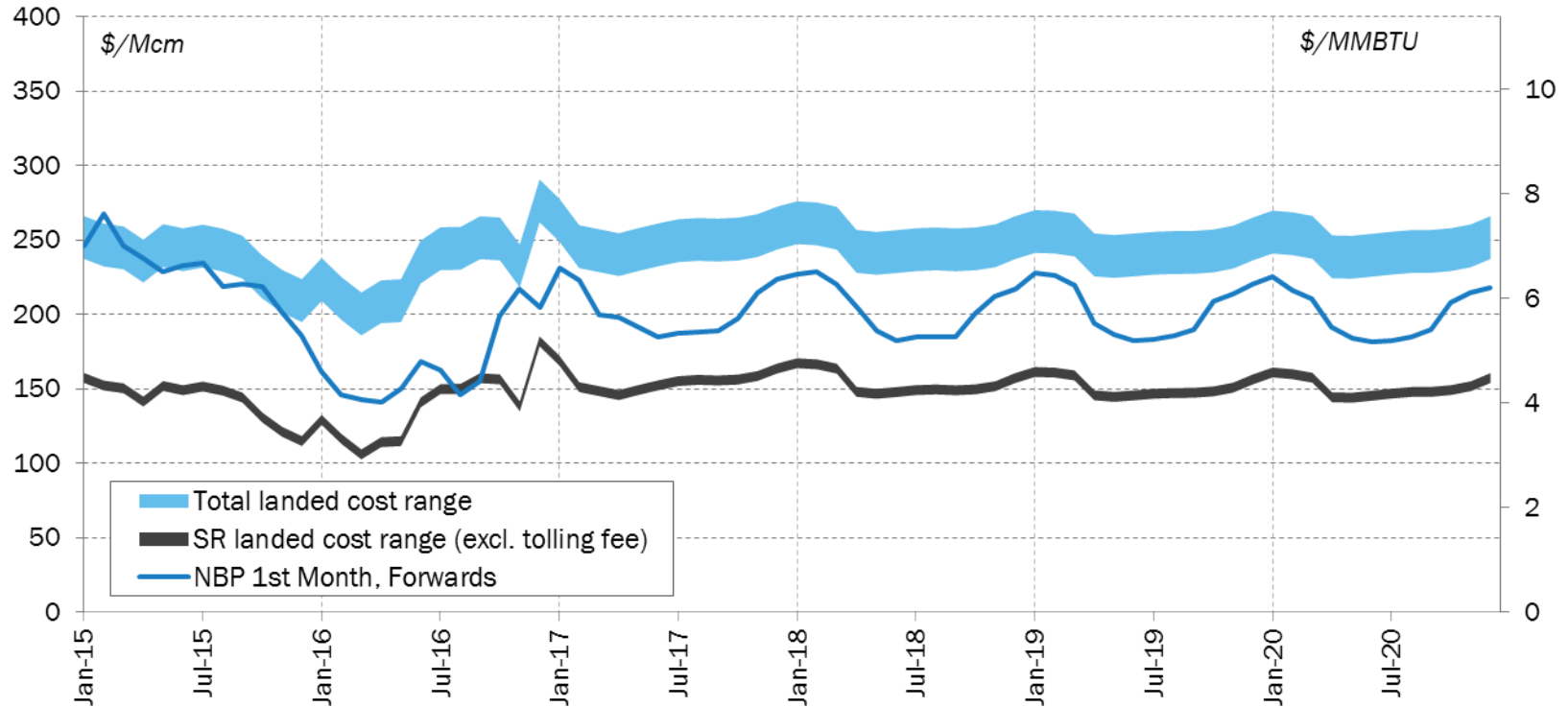
| | Henry Hub | 115% plant losses | Shipping to Europe | Regas | Toll Fee | Short-run Marginal Costs | Total costs | NBP MA |
|--------|-----------|-------------------|--------------------|-------|----------|--------------------------|-------------|--------|
| Feb-17 | 2,82 | 3,24 | 0,67 | 0,40 | 2,37 | 4,31 | 6,68 | 6,36 |
| Jan-17 | 3,26 | 3,75 | 0,67 | 0,40 | 2,37 | 4,82 | 7,19 | 6,58 |
| Dec-16 | 3,58 | 4,12 | 0,67 | 0,40 | 2,37 | 5,18 | 7,55 | 5,83 |
| Nov-16 | 2,50 | 2,88 | 0,67 | 0,40 | 2,37 | 3,94 | 6,31 | 6,19 |

Full costs of US LNG delivered to Europe are higher than prices on the European hubs (NBP). NA LNG deliveries are profitable on short-run marginal costs.

* $P = HH \text{ forwards} * 115\% + \text{liquefaction} + \text{shipping to Europe} + \text{regasification}$
 Sources: Bloomberg, Wood McKenzie

Bouy#3. Outlook for NA LNG Export to Europe

US LNG Landed Cost in Europe

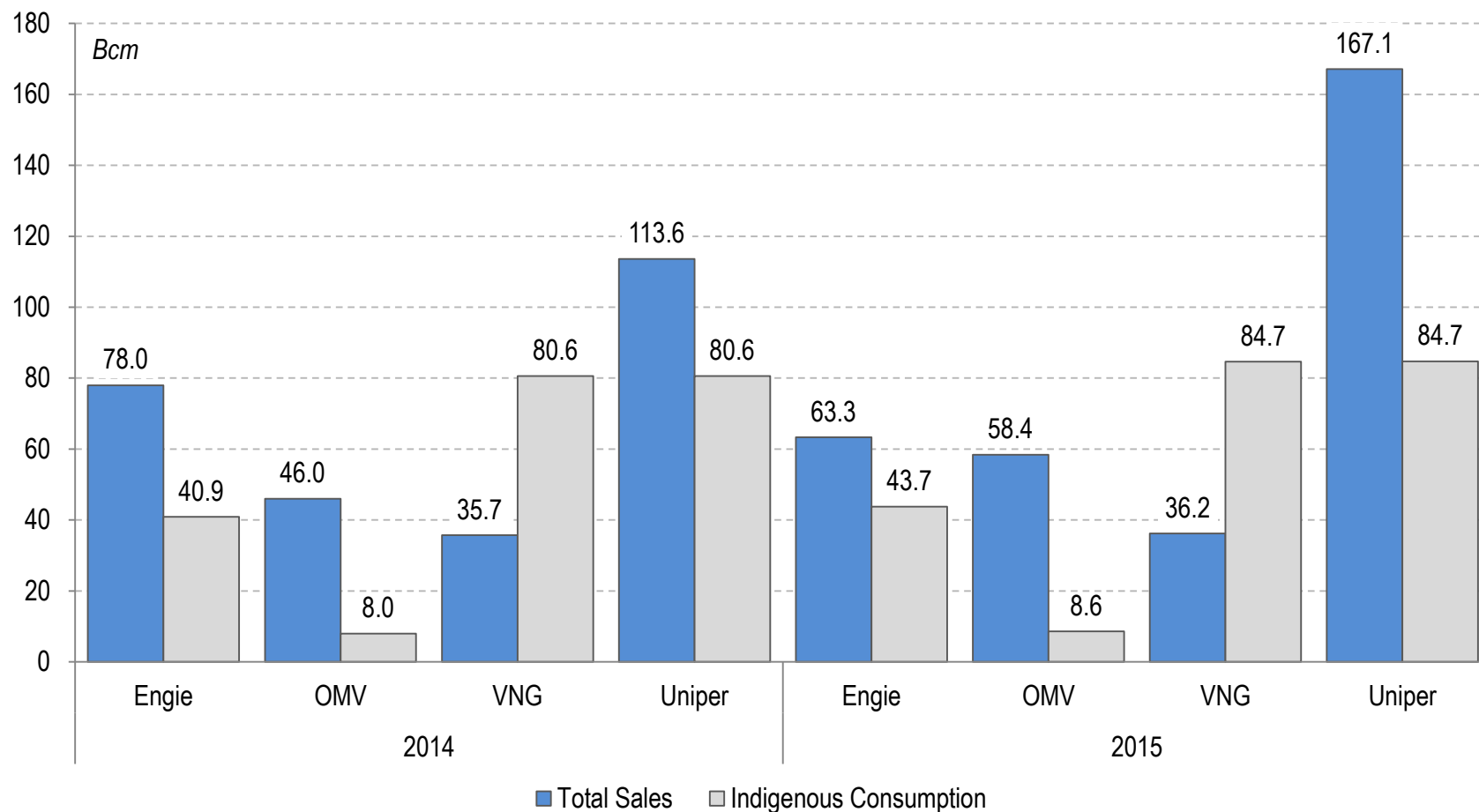


Full costs of US LNG delivered to Europe are higher than European hub prices on a forward curve, although are profitable when tolling fees are excluded.

* $P = HH \text{ forwards} * 115\% + \text{liquefaction} + \text{shipping to Europe} + \text{regasification}$

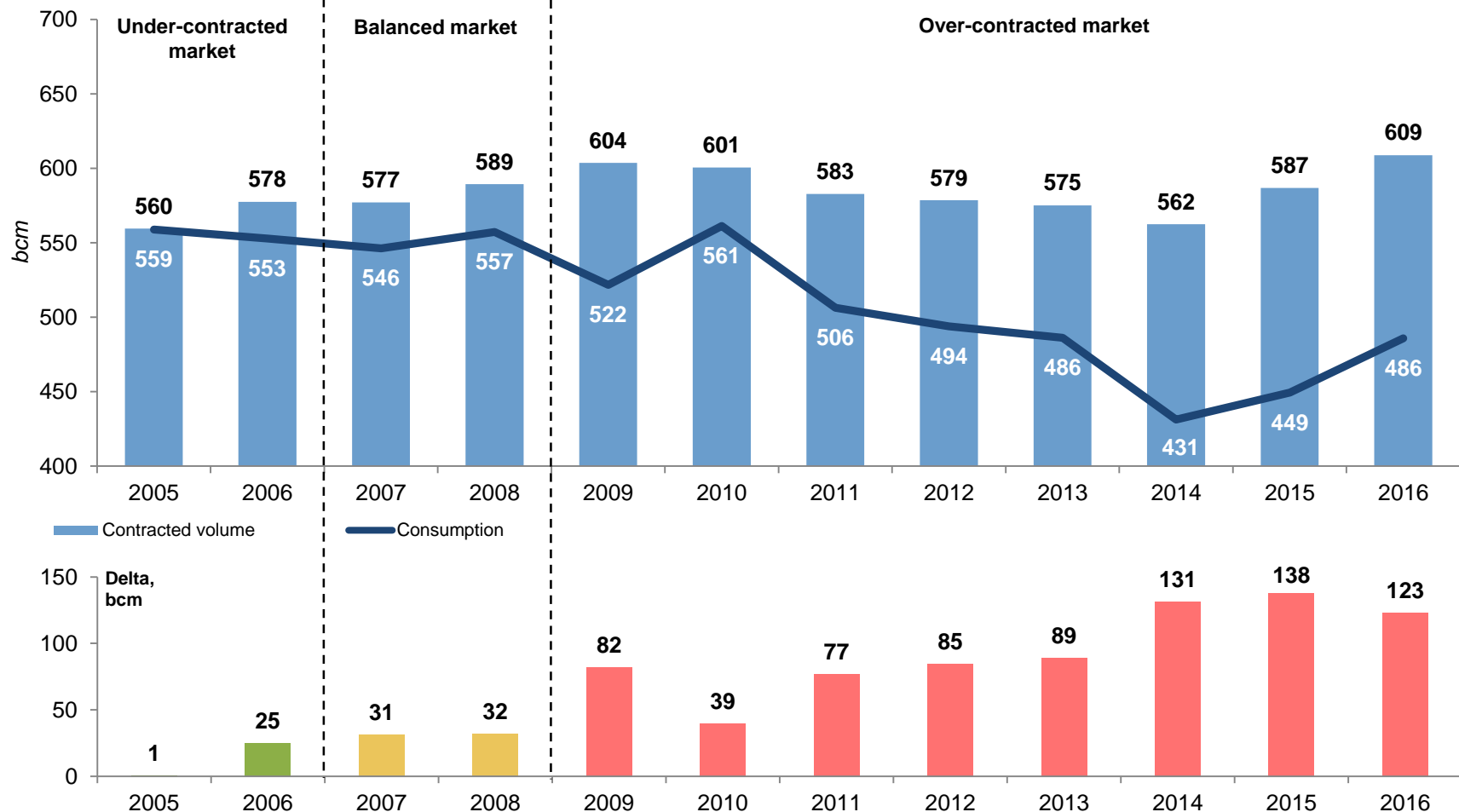
Sources: Bloomberg, Wood McKenzie

Growing Importance of Forward Market Compared to Prompt Market: Trading Volumes by Utilities/Midstreamers are Higher than Gas Consumption



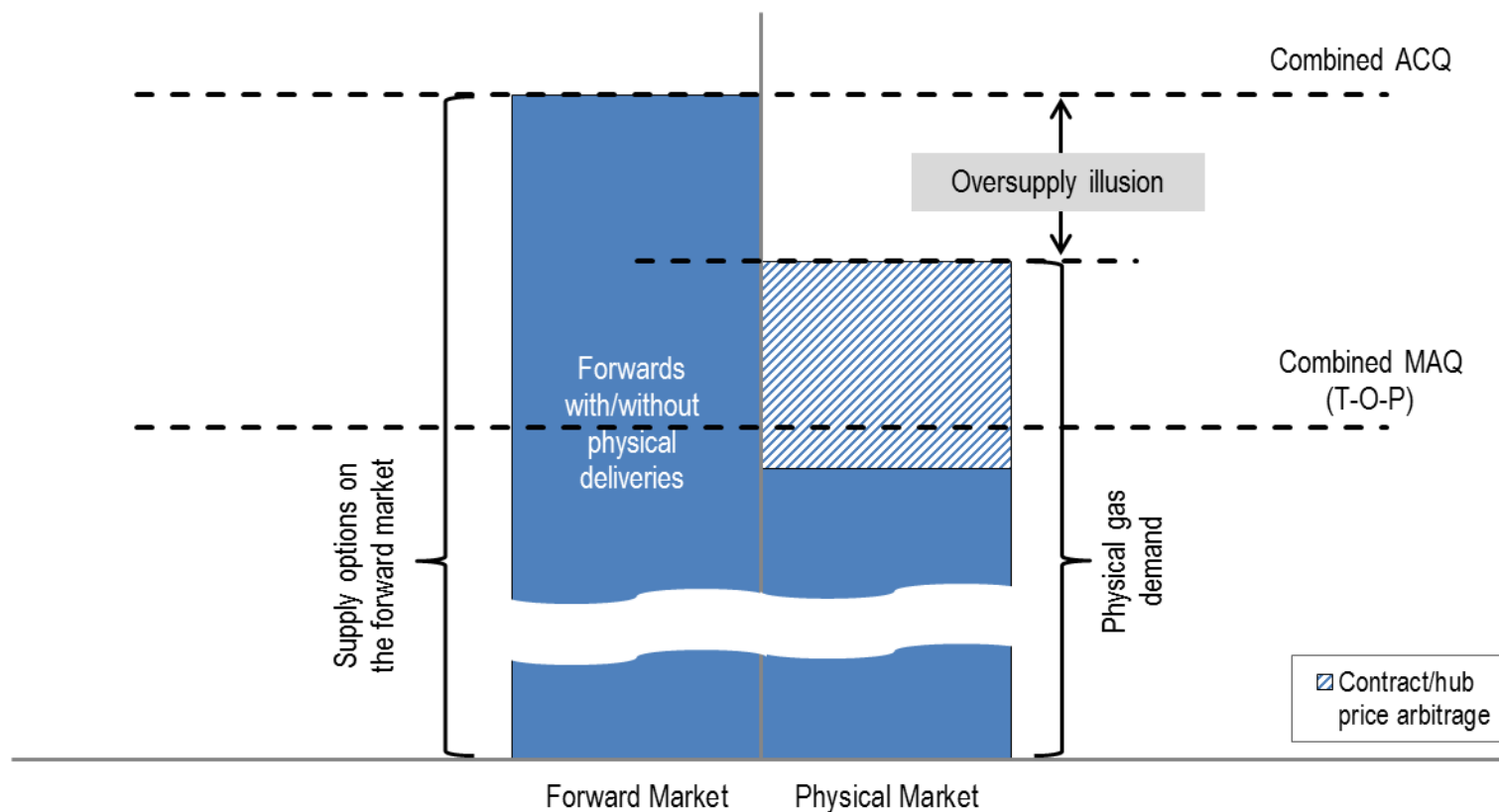
Source: IEA, Companies' Annual Reports

Overcontraction as Factor of Hub Price Degradation

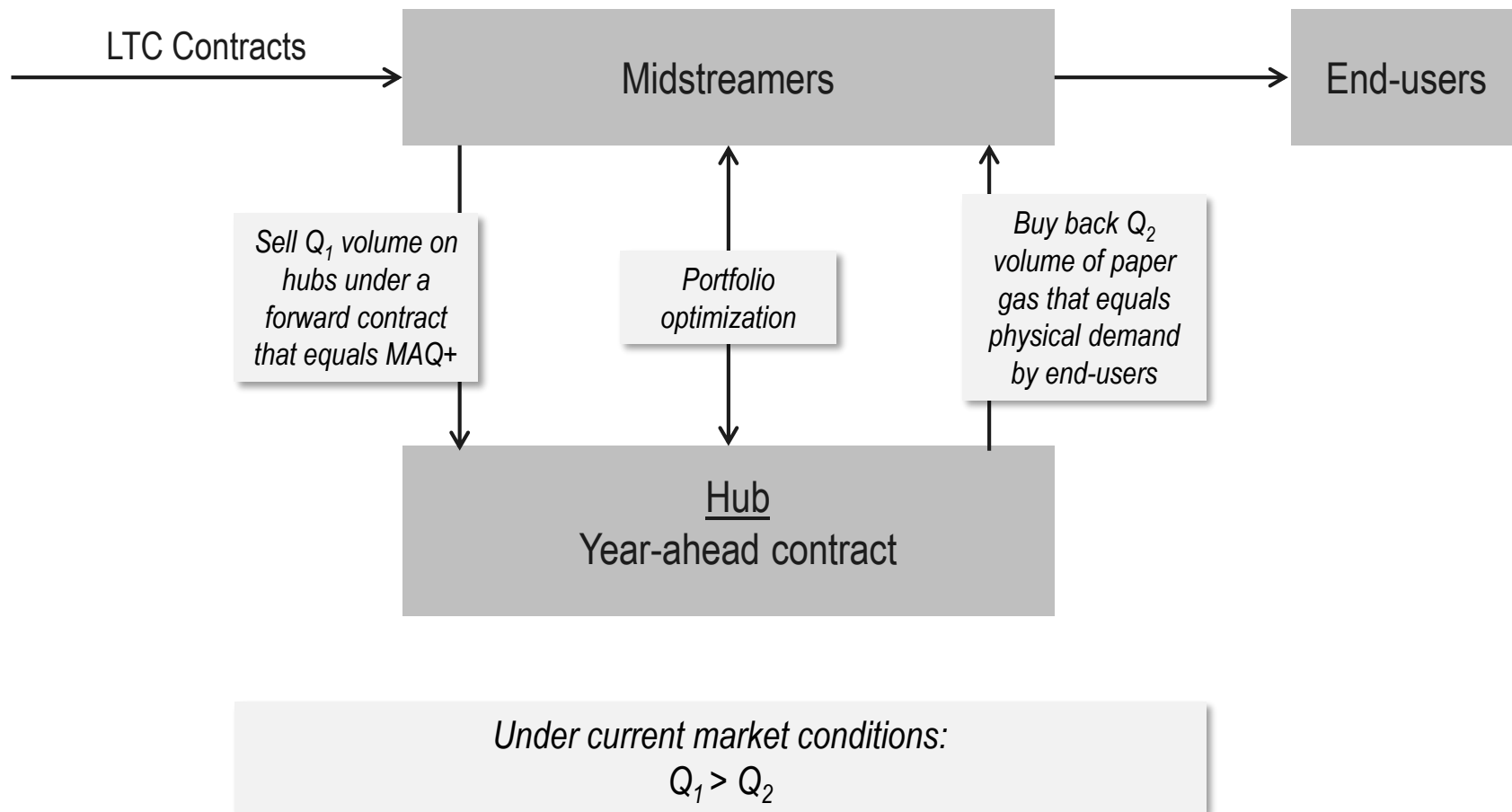


*Demand Includes import contracts and indigenous production
 Source: Cedigaz, Eurostat, IEA, Gazprom Export LLC Database

Illusion of Oversupply Created by Monetization of Contract Commitments on the European Forward Market



There is Need to Rebalance Market by Eliminating Paper and Physical Gas Disconnect





THANK YOU FOR YOUR ATTENTION!