

A large, stylized graphic of a flame in shades of light blue, composed of several curved, overlapping shapes that suggest the movement of fire. It is positioned on the left side of the slide.

Gas Price – Quo Vadis?

A View from Gazprom Export

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What is the Main Driver of European Hub Prices?

- The debate today will center on the answer to the following question:
What forces set the baseline trend for hub prices in Europe?
- Although the combination of forces that sets hub prices is extremely complex, this should not prevent us from indentifying their main driver. When specified and ranked by dominant position, the choice is between two options:
 - **The oil-indexed prices in long-term contracts; and**
 - **Supply and demand for gas on the European market**
- We maintain that hub prices are dependent on long-term oil-linked contract prices, which set the baseline trend for hub pricing. Stern and Rogers, however, claim that it is supply and demand for gas on the European market that primarily governs hub price behavior.
- The intention of my paper was to point to the collective failure of industry participants - including some producers, politicians, journalists, the public at large and even some academics - to understand the true nature of hub prices within the European hybrid pricing system.

Hub Prices are in Fact Derivatives of Oil-indexed Prices

Hub prices are formally 'delinked' but they are driven by oil indexes. NBP and TTF prices are not only reasonably aligned to each other but have a strong positive correlation with Gazprom's oil-indexed prices with coefficients of 0.75 and 0.79, respectively. Doesn't this prove that these prices are not independent but are, in fact, derivatives of oil-indexed prices?

GERMANY/NETHERLANDS/AUSTRIA Oil moves TTF and NCG from bulls to bears

Gains on the TTF prompt and curve at the start of week 14 were quickly eroded.

BELGIUM
Supply disruptions put bulls in charge; oil lifts far curve

Prompt prices at the Zeebrugge natural gas hub rose sharply on Monday, boosted by Nyhamna processing plant in Norway which is anticipated to remain offline.

But the prompt could not resist the downward pressure and instead responded to mild

GERMANY/AUSTRIA/ITALY/CZECH REPUBLIC
Warm weather and crude oil lead to declining prices at NCG

Expected temperatures well above the average capacity to sell the product Day-ahead gas into storage instead

NETHERLANDS
Curve down on weather, currency and Brent losses

The TTF prompt and curve sustained losses across the board. An increase in sunny and storage, despite the cold snap, one source commented.

NETHERLANDS
Bears tighten grip on TTF as weather and oil limit demand

A softening oil curve, continued warm weather and lack of buying interest from

Despite opening in line with Wednesday close the TTF Day-ahead lost almost €1.00

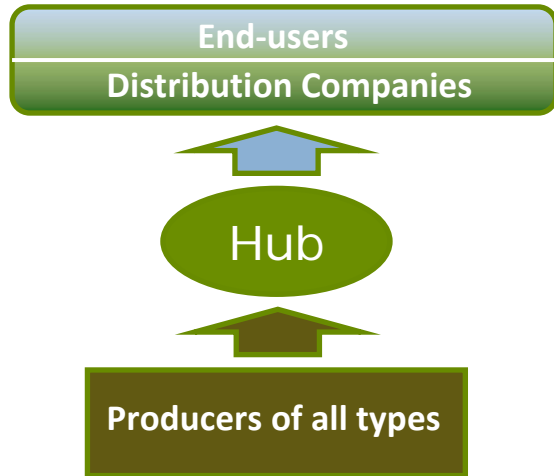
BRITAIN
Day-ahead resists bullish curve momentum as crude oil climbs

The NBP Day-ahead settled marginally lower on Wednesday despite trading at a ed reluctant gains, falling to increase to the same extent as longer-dated gas contracts.

Source: ICIS Heren

European Hub Prices are not an Indication of Supply and Demand Fundamentals

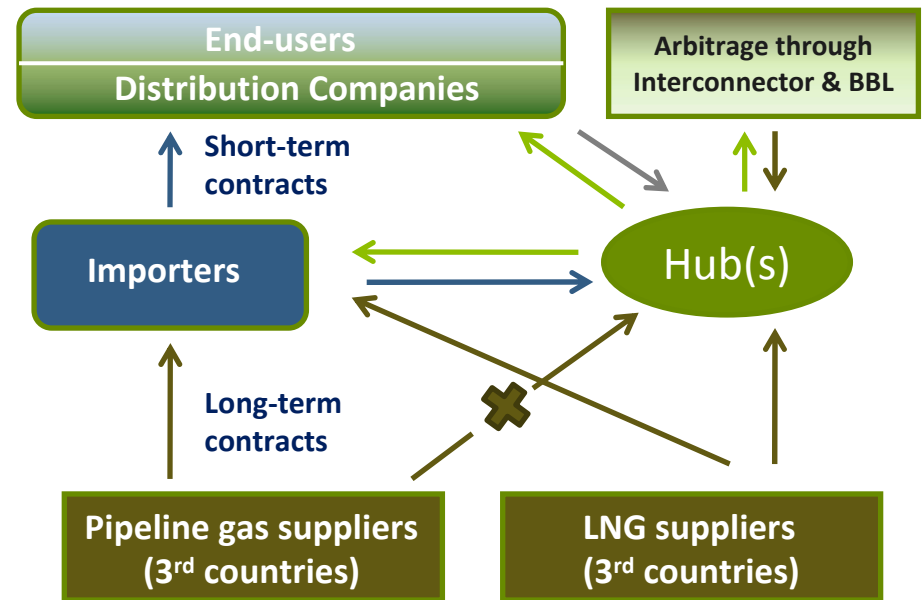
U.S. Pricing Model



PH_{US} – hub price in the USA
 S_{US} – total supply
 D_{US} – total demand

$$PH_{US} = F(S_{US}, D_{US})$$

Hybrid Pricing Model



$$PH_{CE} \neq F(S_{CE}, D_{CE})$$

PH_{CE} – hub price in Continental Europe

SH_{CE} – total supply = $SHI_{CE} + SHEU_{CE} + SLNG_{CE} + SUK_{CE}$,

where:

SHI_{CE} – sales to hubs by importers

$SHEU_{CE}$ – sales to hubs by end-users (ToP obl.)

$SLNG_{CE}$ – LNG supply to hubs

SUK_{CE} – UK supplies through the Interconnector & BBL

DHI_{CE} – demand by importers for hub gas

$DHEU_{CE}$ – demand by end-users for hub gas

DUK_{CE} – UK deliveries through the Interconnector and BBL

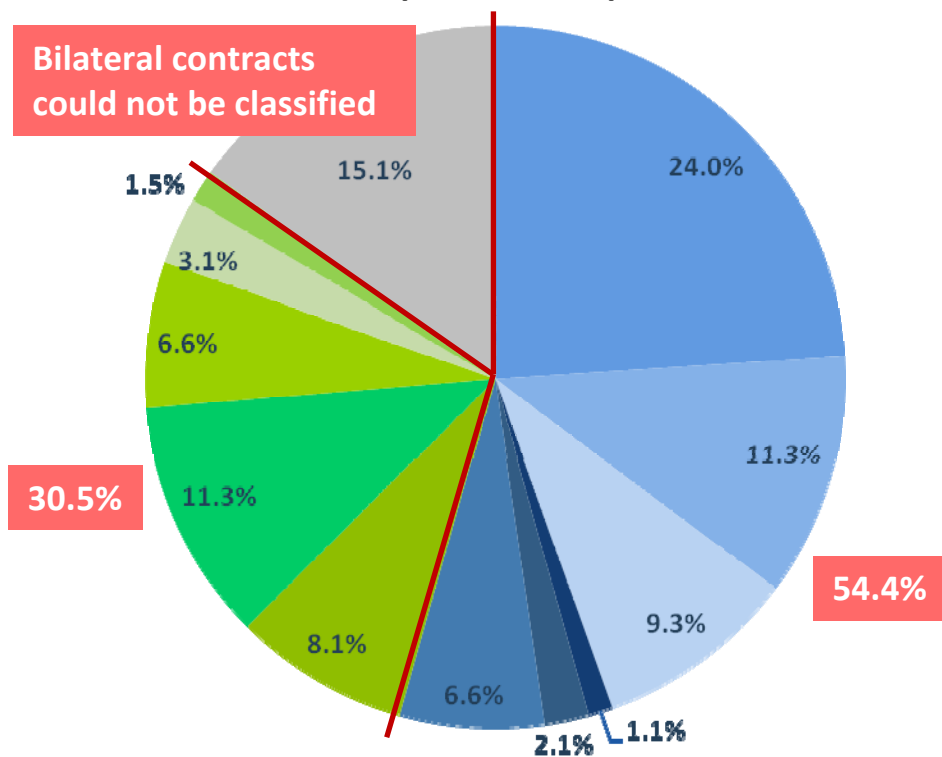
$$PH_{CE} = F\{(SHI_{CE} + SHEU_{CE} + SLNG_{CE} + SUK_{CE}), (DHI_{CE} + DHEU_{CE} + DUK_{CE})\}$$

Who Needs Potemkin Villages?

- According to Société Générale analyst Thierry Bros, a major tipping point has been reached in the European gas market, with oil-indexed gas slipping from 58% of the total gas market in 2011 to 55% in 2012. By 2014, according to Bros, oil-indexed pricing will represent the minority of European gas supply.
- However, I would caution you not to make far-reaching conclusions based on one controversial study, especially when the evidence still overwhelmingly shows that oil-indexation remains the dominant price-setter in Europe.
- In fact, a Reuters report from March 2013 demonstrates that only 34.8%-37.7% of all major European gas supplies are priced off traded hubs.
- A February 2013 study by the American research company PIRA Energy Group came to the same conclusion, estimating that roughly two-thirds of European gas consumption is still oil-indexed.
- The game is not over. Three out of the four major suppliers of gas to Europe still support oil-indexation and prefer to sacrifice value over their principles and long-term interests.
- The phrase a “Potemkin village” is often used to describe a construction (literal or figurative) that is built solely to deceive others into thinking that a situation is better than it really is. High-ranking European politicians should be more careful when using such exaggerated figures for gas indexation.

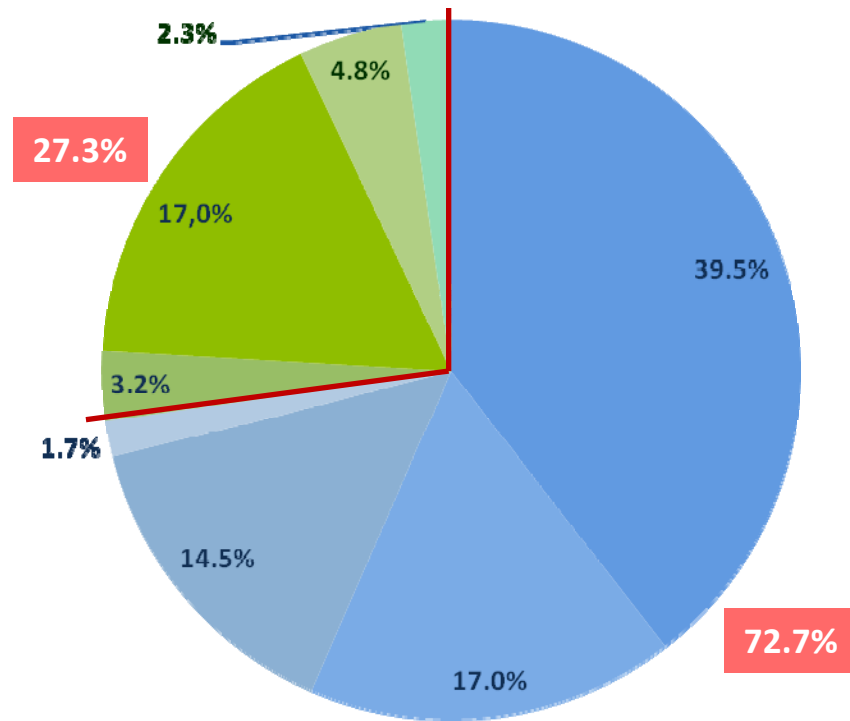
Hub-indexed vs. Oil-indexed Pricing

Total European consumption in 2012*



- Gazprom oil-Indexed
- Norway oil-Indexed
- Algeria oil-Indexed
- Libya oil-Indexed
- Qatar oil-Indexed
- Netherlands oil-Indexed
- UK domestic hub-Indexed
- Norway hub-Indexed
- Netherlands hub-Indexed
- Qatar hub-Indexed
- Gazprom hub-Indexed
- Other European supplies

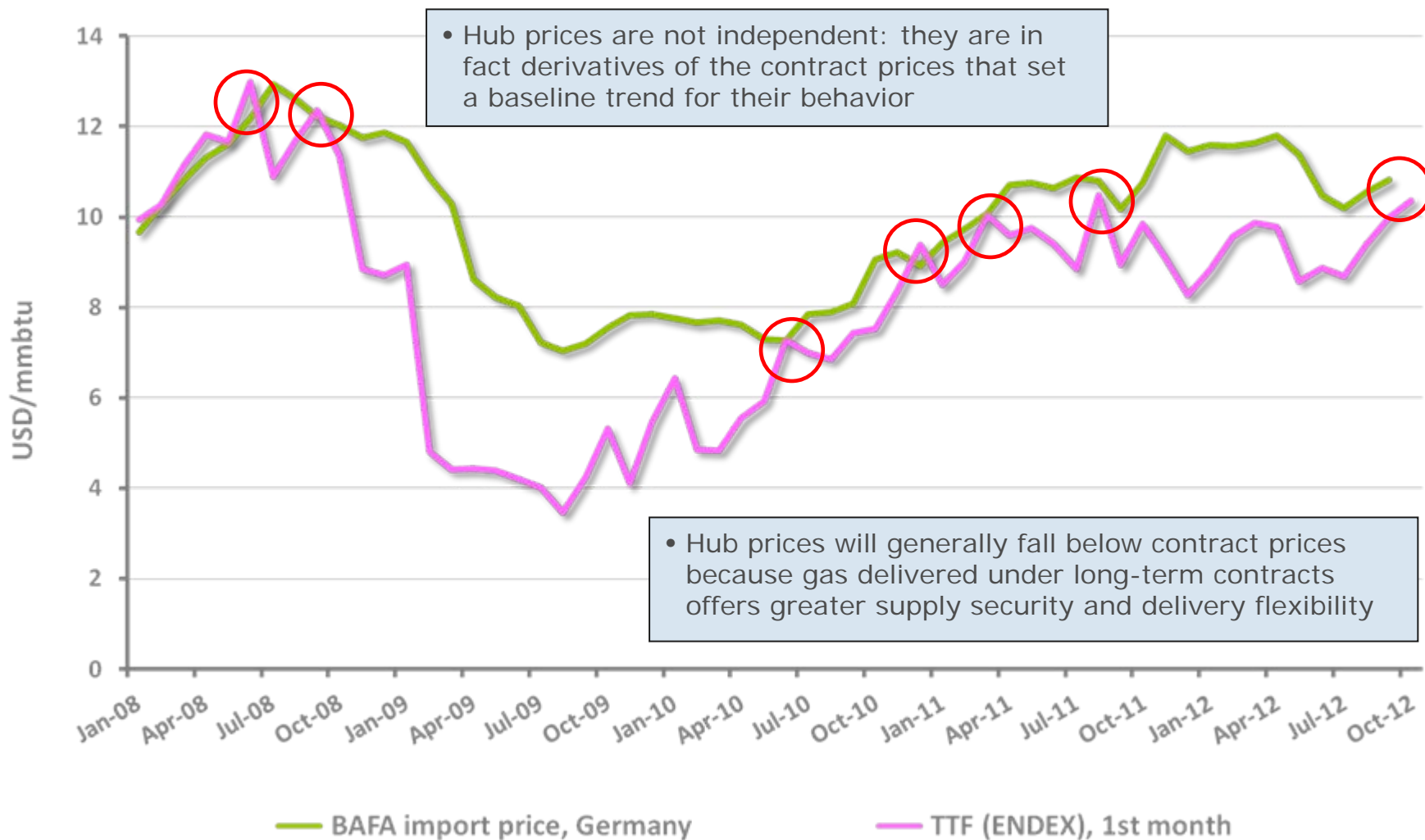
Only imported gas in 2012



- Gazprom oil-Indexed
- Norway oil-Indexed
- Algeria oil-Indexed
- Libya oil-Indexed
- Qatar oil-Indexed
- Norway hub-Indexed
- Qatar hub-Indexed
- Gazprom hub-Indexed

*Excluding Baltic and CIS countries and including Turkey

Asymptotic Contract and Spot Price Behavior

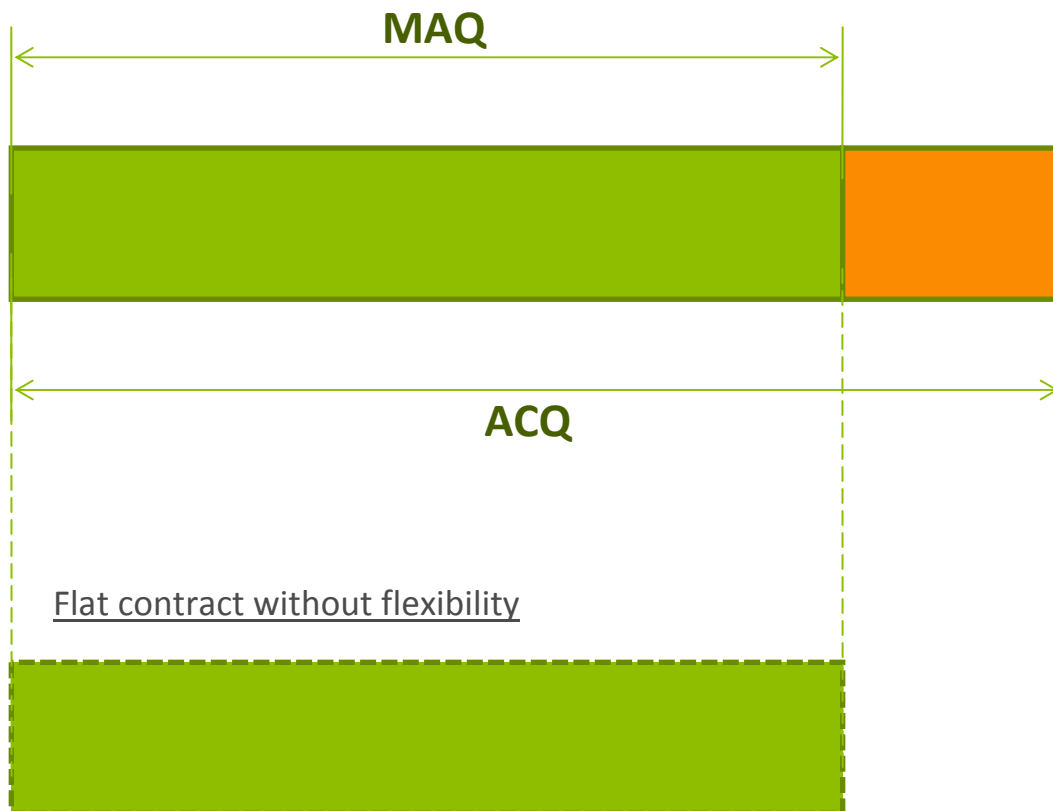


Sources: Bloomberg, BAFA

Explanation of the Contract-Hub Price Gap: Contracted Gas Offers Greater Supply Security

Contract with flexibility

Assumptions



Arbitrage opportunities between BAFA and TTF for the period 1 July 2010 – 30 November 2012 under the following assumptions: gas in the required quantities is available on the hubs; the additional cost of delivering gas to the final place of consumption is not included

Additional profits from
arbitrage enhancement
(USD/mcm)

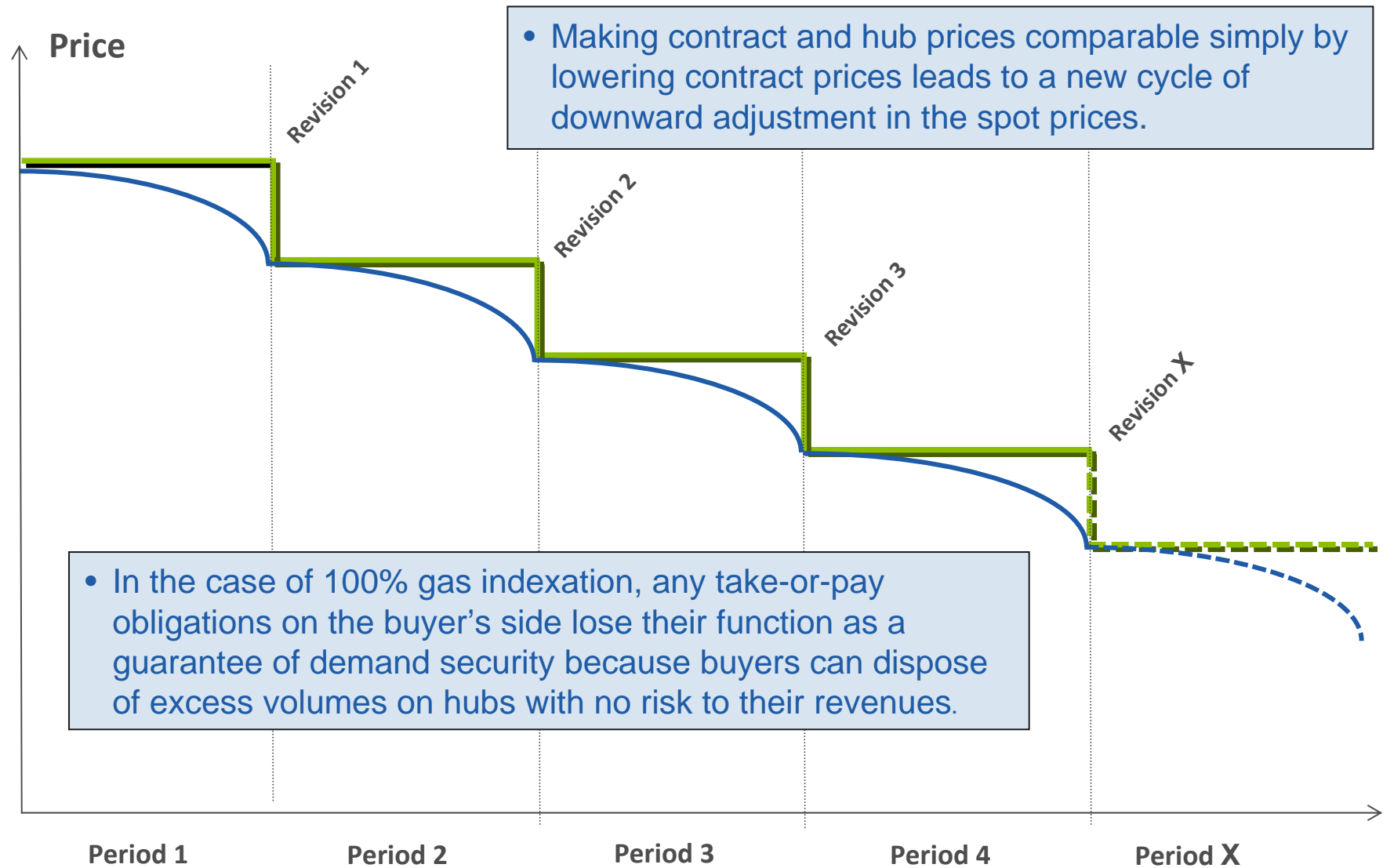
% of flexibility	15%	20%	25%
Average profit	7.99	10.66	13.39
Maximal profit	15.16	19.05	22.78

We can also assume that the amount of the fine that Gazprom must pay if it fails to meet its clients' obligations is a suitable proxy for the supply security and delivery flexibility premium embedded in the long-term contract price

Explanation of the Contract-Hub Price Gap: Contracted Gas Offers Enhanced Delivery Flexibility

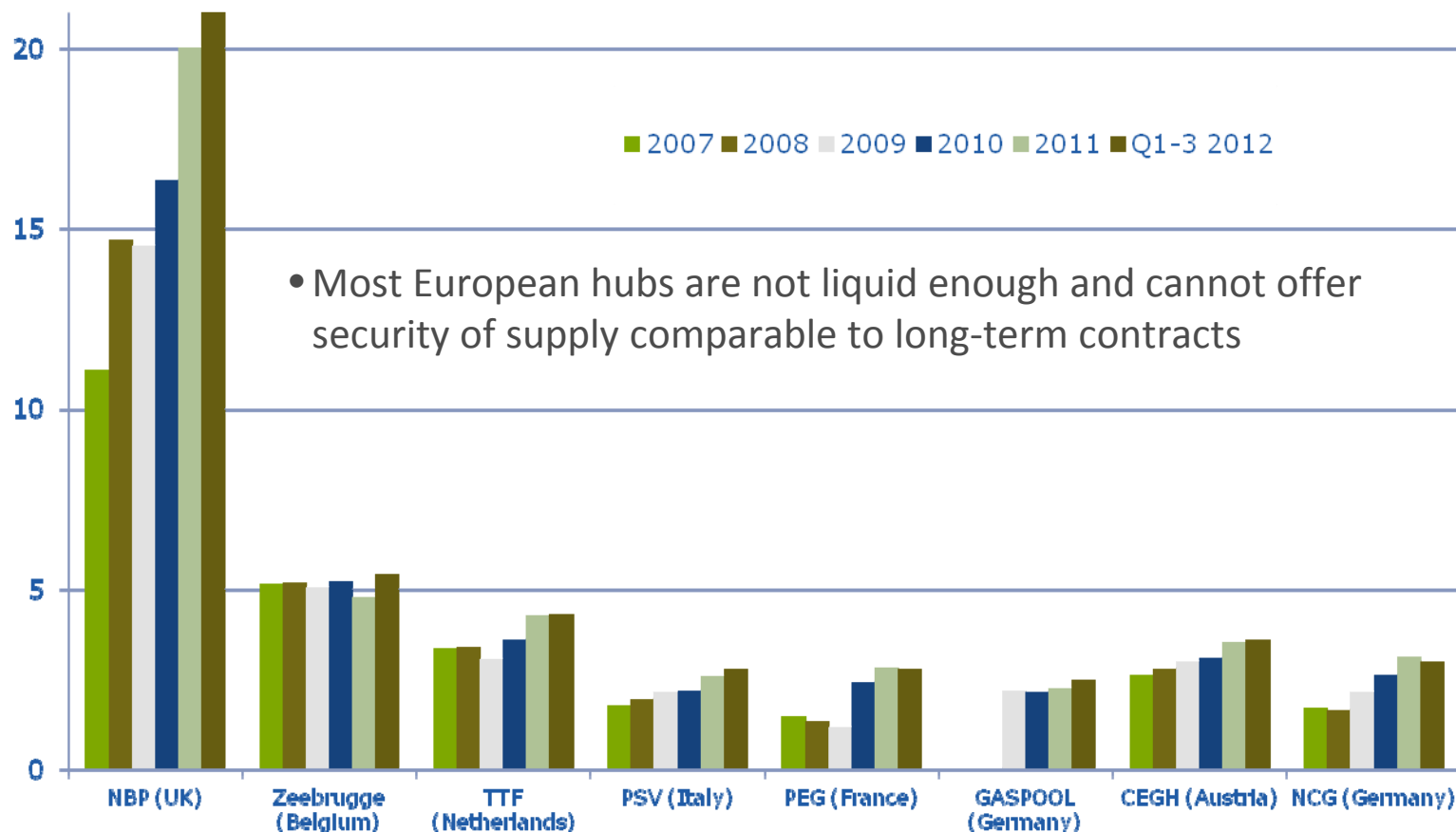
<p><u>Cost of Seasonal Flexibility</u></p>	<p>Average cost of full-cycle gas storage <i>(assumes that over the year the volume of gas pumped into underground storage equals to the volume of withdrawals)</i></p>	<p>US\$21.45/mcm</p>
<p><u>Cost of Short-term Flexibility</u></p>	<p>Additional transportation capacity payments for flexible capacity <i>(7,000 hours of flexibility)</i></p>	<p>US\$13.7/mcm</p>

Mechanism for Gas Price Erosion



THANK YOU FOR YOUR ATTENTION!

Continental Churn Ratios are Low but Sufficient to Serve a Balancing Function



Source: CERA, based on TSO data

The Fair Price for Gas: Oil-Indexed Gas is Not Overpriced Compared to a Broad Range of Commodities

- The price for a significant portion of traded commodities has grown 3-4 times over the last decade
- Oil-indexed gas has grown in line with other commodities, while hub-linked gas has lost some of its value

	Average prices, ratio to 2001:		
	in 2010	in 2011	in 2012
Metals:	2,9	3,2	2,8
Zinc	2,4	2,4	2,2
Steel	2,4	2,6	2,4
Aluminum	1,5	1,7	1,6
Nickel	3,3	3,6	2,9
Tin	4,7	5,6	4,9
Agricultural crops	2,2	2,7	2,3
Wheat	2,2	2,6	2,7
Corn	2,0	3,0	3,0
Cotton	2,0	2,8	1,8
Cocoa	2,9	2,8	2,3
Orange juice concentrate	1,7	2,0	1,6
Chemicals	2,5	3,2	3,3
Ammonium nitrate	2,7	3,9	4,6
Potassium Chloride	2,8	3,7	3,9
Methanol	1,8	2,2	2,2
Rubber	2,6	3,2	2,5
Oil and oil products	3,1	4,3	4,5
Brent	2,9	4,0	4,1
Gas oil	3,2	4,5	4,7
Fuel oil	3,0	4,0	4,2
Diesel	3,4	4,6	4,8
Natural gas:	2,0	2,6	2,6
Henry Hub, USA	1,1	1,0	0,7
NBP, UK	2,0	2,9	3,0
LNG, import in Japan	2,6	3,5	3,9
BAFA	2,2	2,8	2,9
Coal	1,6	2,0	1,8

Source: Bloomberg