

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 jets.

Gas Pricing for Europe – Oil-Indexed plus Hub Prices

A View of Gazprom Export

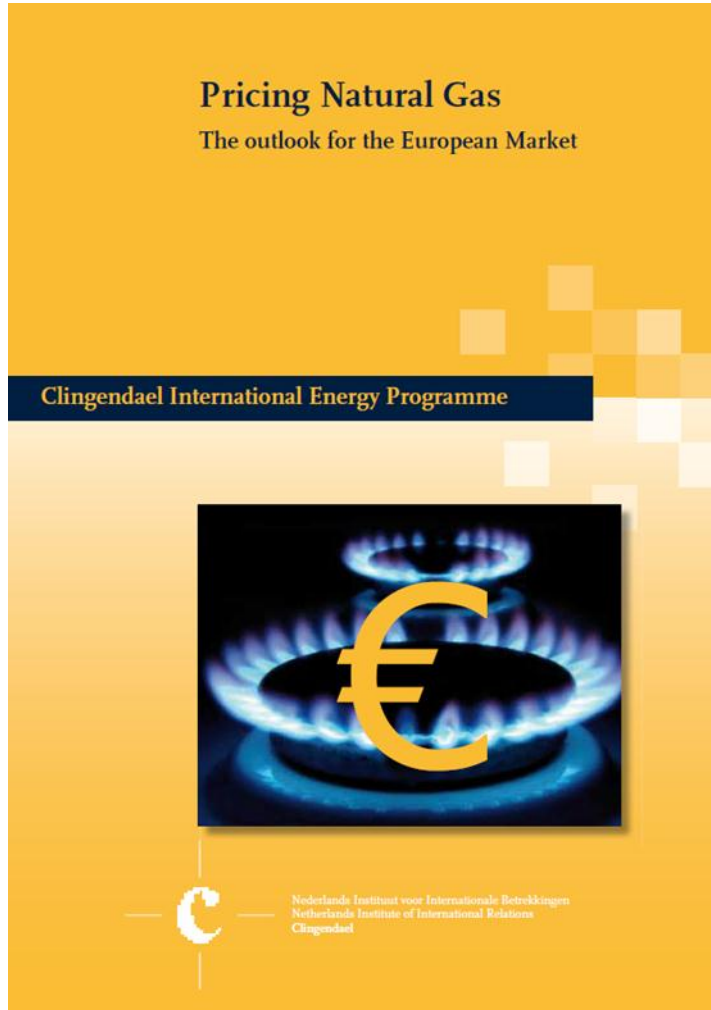
Sergei Komlev

Head of Contract Structuring and Price Formation
Gazprom Export

Lisbon, October 2, 2012

Before Moving from A to B You Should Understand where You Stand now

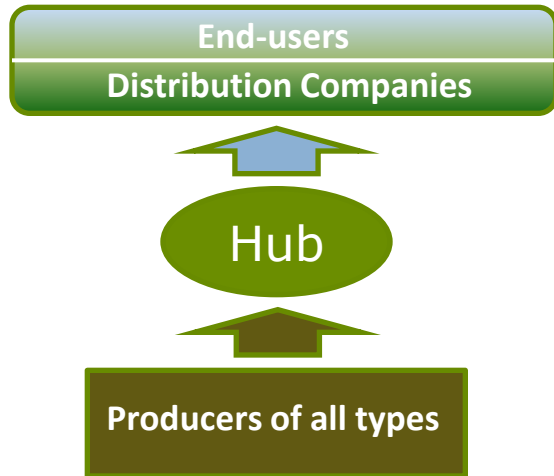
- In order for the European hub to produce a sustainable price benchmark they should meet two requirements:
 - Firstly, these prices should be a genuine barometer reflecting total continental supply and demand conditions in Europe and/or at least a large segment of it (for example, of the North-West).
 - Secondly, hub prices should be self-sufficient, fully independent from the oil-indexed prices, not driven by the fundamentals of another market.
- Mainstream European analysts share no doubts as to the readiness of the existing hubs to take over from oil products as price indexes for long-term supply contracts.
 - For example, see J. Stern and H. Rogers, The Transition to Hub-Based Gas Pricing in Continental Europe. Oxford Institute of Energy Studies, NG 49, March 2011, pp.6-7.
 - They insist that there should be “a single mechanism for pricing gas” and hub prices “accurately reflect changing supply and demand conditions”.
 - Further, even with all of their imperfections, they argue, European hubs provide the best indicator of a market price which long-term contracts increasingly need to reflect. Hub prices are driven by their own fundamentals and could be higher or lower than the oil-indexed prices.
 - According to the mainstream analysts, these two prices are independent from each other and exist nearly in parallel worlds.
- Realities of the existing hybrid gas market in Europe do not match with these mainstream conclusions.



2008 Clingendael's Research Paper "concludes that there is no strong evidence that the current hybrid situation, in which both forms of gas pricing co-exist, cannot continue. There are also no overriding reasons to intervene in the market practices of price formation. Both systems have their advantages and disadvantages under different market conditions, and to some extent compliment each other in the current markets. Different types of risk and the appreciation thereof by the trading parties will determine particular choices of pricing rules and contracting conditions".

Hub Prices are not an Indication of European Supply and Demand

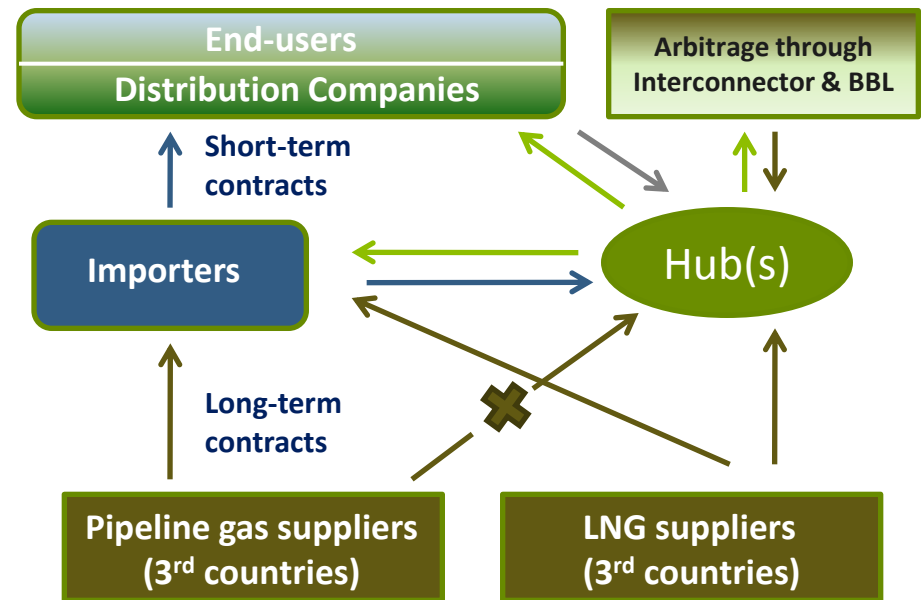
U.S. Pricing Model



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

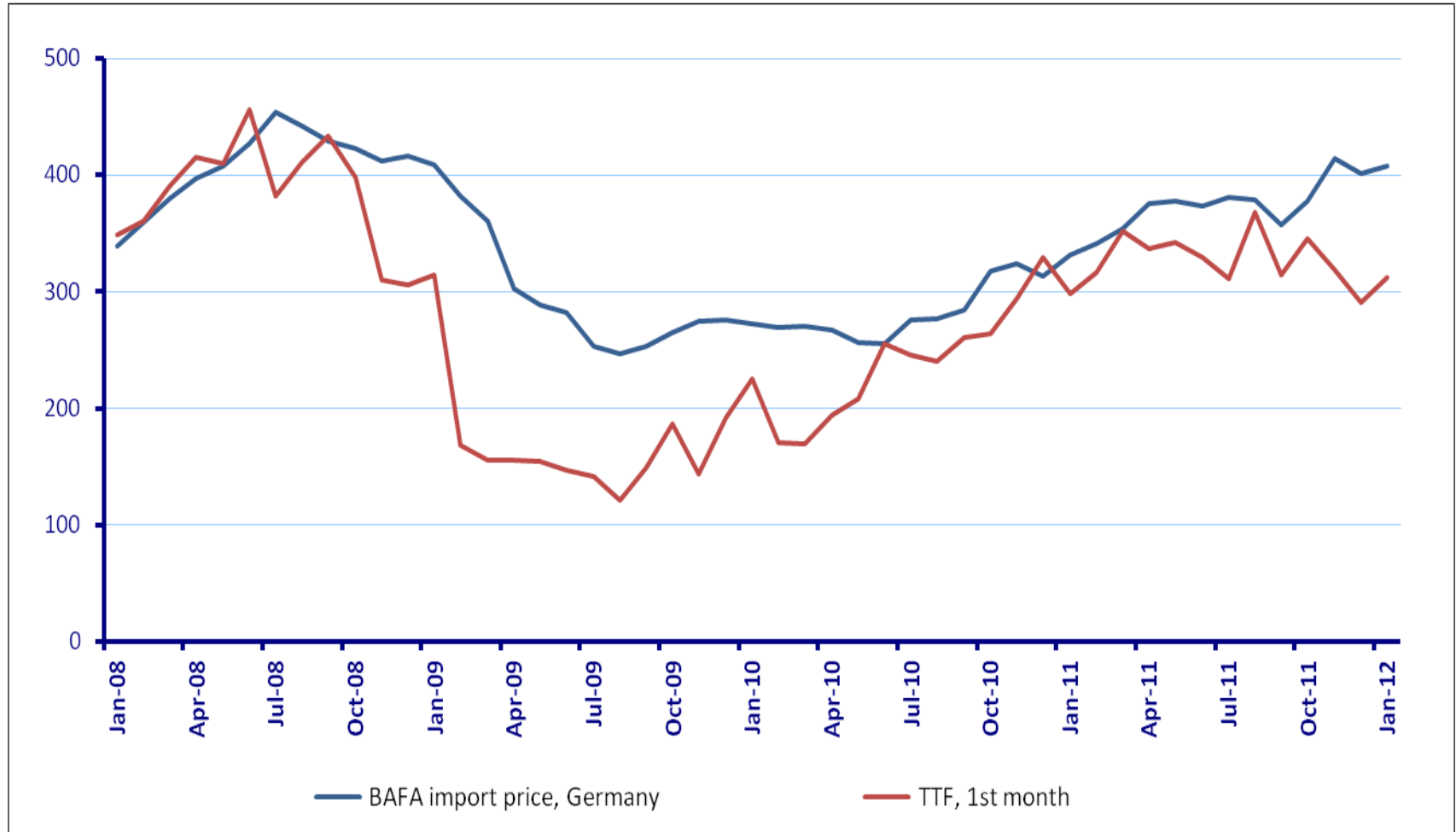
DHI_{CE} – demand by importers for hub gas

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

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

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

Asymptotic Contract and Spot Price Behavior



Hub Prices are in Fact Derivatives of Oil-indexed Prices

That asymptotic relationship explains why 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 free enough but are in fact derivatives of Gazprom 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, however, Nyhamna processing plant in Norway 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 norm caused NCG Day-ahead to shed €0.01

age 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

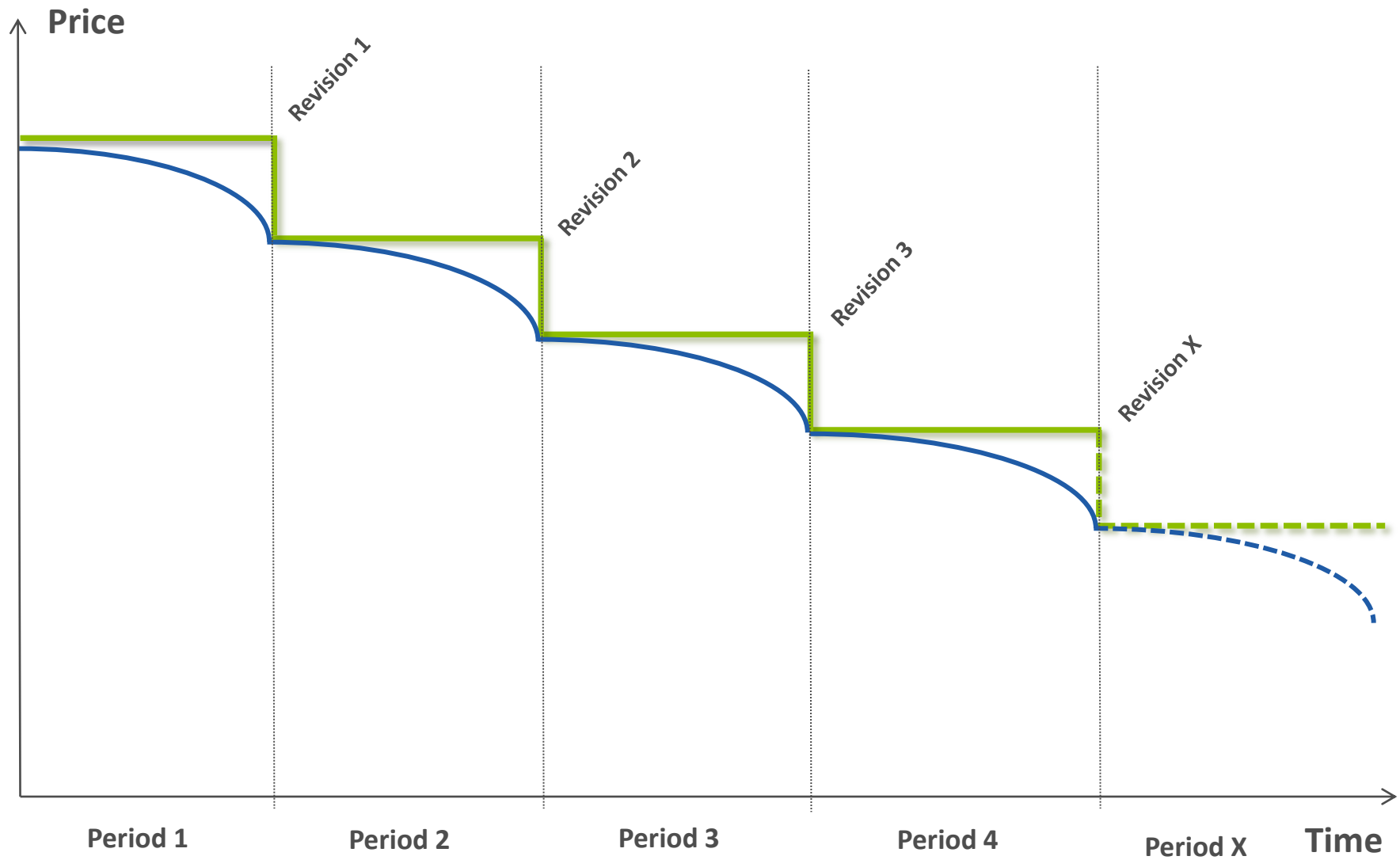
Day-ahead resists bullish curve momentum as crude oil climbs

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

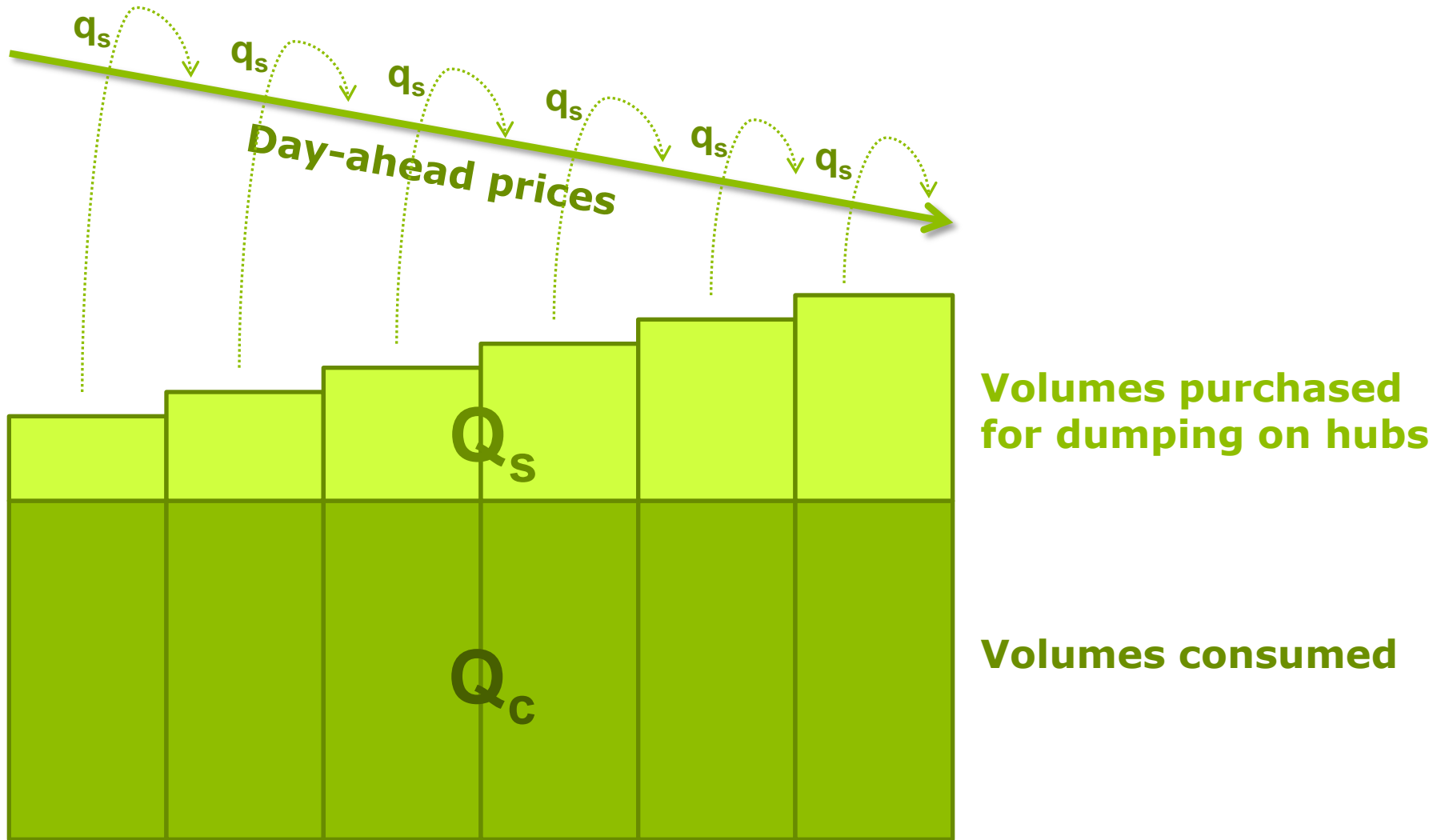
Reasons for Hub Prices to be Lower than Contract Prices in a Mature Hybrid Pricing Model

- The major reason for the price diversion is the value of flexibility provided by long-term pipeline suppliers.
 - Hubs offer standard lots with no flexibility.
- The second reason why spot prices usually lag behind contract prices is the existence of one-sided balancing on hubs.
 - In the case of a short-term undersupply, it is more convenient to use the existing long-term contract arrangements for securing additional deliveries.
 - In the case of oversupply, selling gas at hubs is a quick-fix.
- The third reason for diversion between hub and long-term contract prices is the availability of flexible LNG that is rerouted from the USA, cheap gas from the UK that arrives to the Continent through the Interconnector, or gas from storage that was acquired at a time when contract prices were lower.

Mechanism for Gas Price Erosion



Dumping by Buyers' Cartel in Case of 100% Indexation



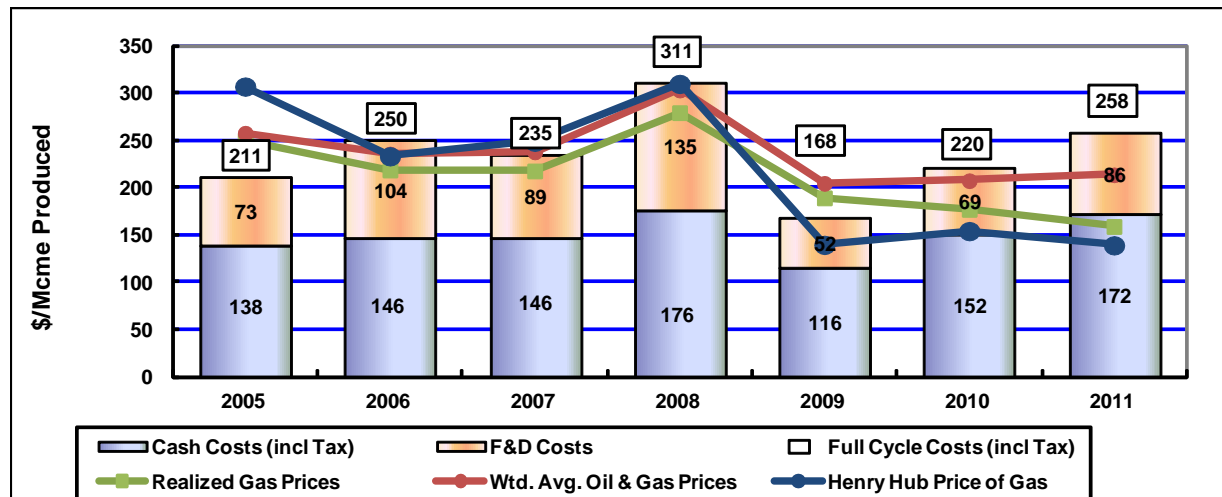
Dumping persists until $Q_s = Q_c$

Fundamental Differences

1	USA	Hub price is a function of total demand and supply
	Continental Europe	Hub prices are a function of multiple examples of arbitrage
2	USA	One price at a level determined by Henry Hub
	Continental Europe	Multiplicity of prices Company supply managers determine the price of gas portfolio
3	USA	Majority of gas is sold on hubs Majority of LT export contracts incorporate diversion clause
	Continental Europe	Small volumes of physical trade on hubs represent primary sales The remaining volumes of gas traded come from LT contracts for pipeline gas
4	USA	High churn ratios
	Continental Europe	Churn ratio below 4 (low, but sufficient for balancing market)

Shale Developers Costs Exceeded Revenues on a Unit Basis

- In 2011 All-in Costs of Shale Developers were above \$256 per Mcme.
- All-in costs jumped 16% in 2011 over 2010, and are 53% higher than in 2009.
- Unit operating costs have returned to pre-crash levels.
- Unit F&D costs, however, remain below peak land-rush levels of 2008.
- Commodity inputs like steel, labor, and various contract services are all still increasing for shale gas producers.
- Huge push to increase oil reserves and produce existing oil reserves has had a significant impact on rising all-in costs.



\$ Per Mcme	2005	2006	2007	2008	2009	2010	2011
Operating Costs	91.26	92.22	95.93	124.30	88.95	115.89	133.95
G&A	11.82	14.12	14.20	15.89	14.68	15.18	15.28
Interest	11.57	13.54	16.32	12.73	12.02	9.50	10.30
Current Tax	23.74	26.16	19.83	23.40	0.00	11.14	12.39
Cash Costs (incl Tax)	138.39	146.04	146.29	176.33	115.66	151.70	171.92
F&D Costs	72.63	103.50	88.86	134.73	52.18	68.61	85.68
Full Cycle Costs (incl Tax)	211.03	249.54	235.15	311.06	167.83	220.32	257.60
Realized Gas Prices	249.83	218.88	217.93	279.50	189.40	177.35	159.24
Wtd. Avg. Oil & Gas Prices	257.87	235.91	238.03	303.43	204.82	207.61	213.81
Henry Hub Price of Gas	307.13	233.43	248.82	309.85	139.85	154.32	139.31

Note: Cash Costs and Current Tax in units of production. F&D costs are in units of reserve additions.

Source: Company 10-Ks

Why Do Producers Continue to Drill with Low Prices and High Costs?

On the surface, increasing reserve acquisitions and shale gas production may be perplexing given the current price environment. However, a deeper analysis indicates the following:

Drilling to Hold Leases:

- Acreage leaseholders are typically required to drill in order to prevent leases from expiring
- Capital must be allocated toward these activities in order to protect leaseholds and to maintain the value of the large upfront investments made to secure leases

Shale Acquisitions and JVs:

- Major oil and gas companies need to book reserves to maintain market capitalization and these investments can increase production capacity
- Increasing political risk outside the U.S. has made the U.S. market more attractive
- Joint venture agreements provide shale gas producers with tax benefits

Wet Gas Wells:

- Many gas wells in shale plays are “wet” and have a liquids component to them
- Value of liquids is substantially higher than dry gas currently
- A typical wet gas well can add another \$35-\$53 per Mcme in value compared to a dry gas well
- U.S. oil is currently trading at ~8 times natural gas.

Oil-Indexed Gas is Not Overpriced Compared to a Broad Range of Commodities

- The price for major portion of traded commodities has grown 3-4 times during last decade
- In comparison with other commodities, gas prices have been growing slower

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

Source: Bloomberg

THANK YOU FOR YOUR ATTENTION!