

A large, light blue, stylized flame graphic on the left side of the slide, composed of several curved, overlapping shapes that suggest the movement of fire or gas.

Pipeline LTCs in the 'New World' of European Natural Gas

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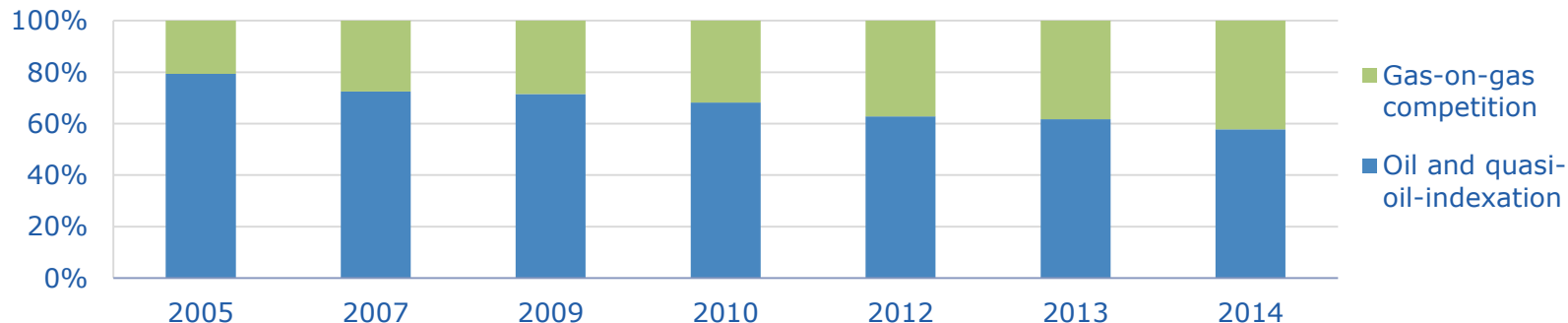
17th Meeting of the EU-Russia
GAC's Work Stream on Internal Market
Vienna, November 30, 2015

Agenda

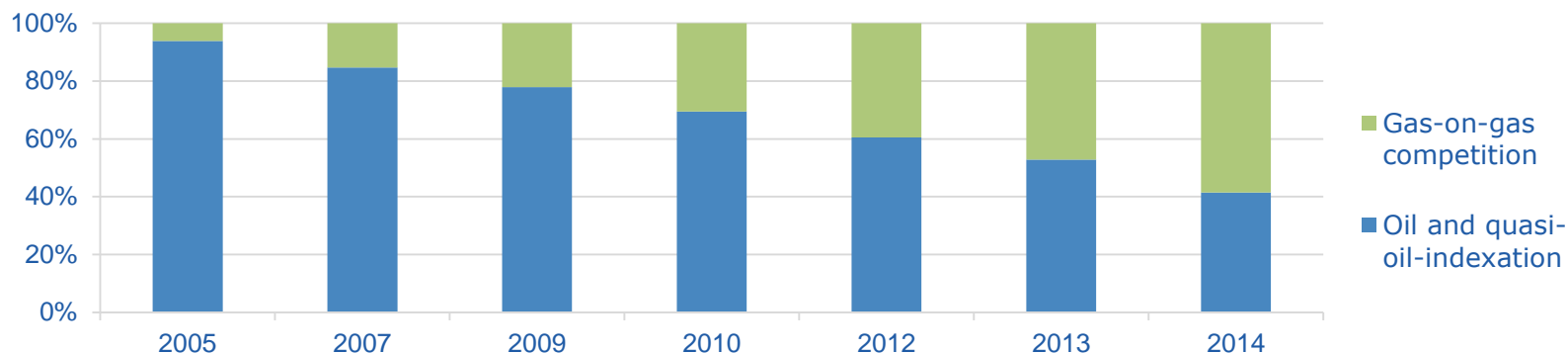
- At present, European natural gas market has a hybrid model with oil-indexation (replacement value principle) being a dominant form of pricing for imported volumes and gas-on-gas competition as its subordinate form
- EU exercises 'soft power' to change pricing paradigm
- New pricing model requires a new design for pipeline gas LTCs
- "Groningen" type LTCs with the implanted gas indexes do not secure a fair distribution of risks between a buyer and a seller
- Existing LTCs should be retrofitted in order to balance the interests of both parties involved
- Adjustment #1: Volumetric fine-tuning
- Adjustment #2: Restriction of the buyers' nomination rights
- Adjustment #3: Revision of the price review clauses

Gas-on-Substitute Competition versus Gas-On-Gas Competition in the International Trade, 2005-2014*

World natural gas imports



European natural gas imports



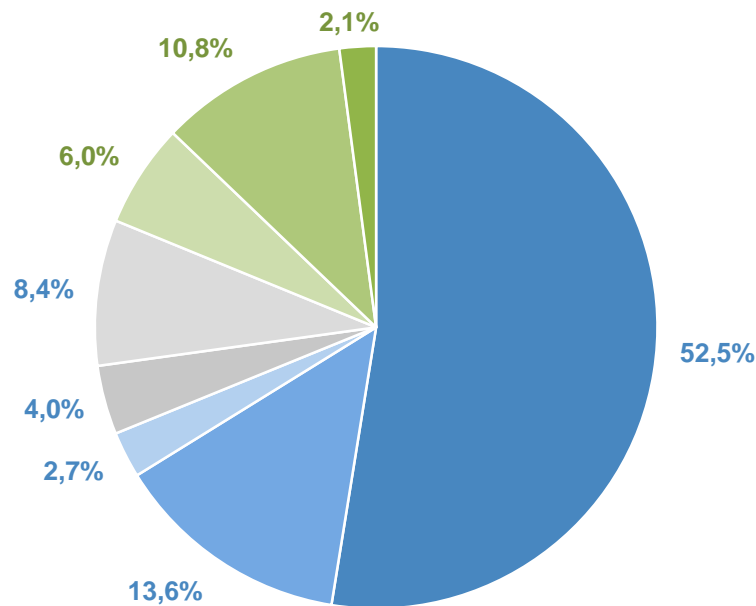
From 2005 to 2014 share of gas-on-gas pricing was growing. Nevertheless, in 2014 oil-and quasi-oil indexation accounted for 58% in the world and 42% in European gas imports.

* - Oil and quasi-oil-indexation is pricing based on inter-fuel competition. Gas-on-gas pricing is reflective of demand and supply interplay.

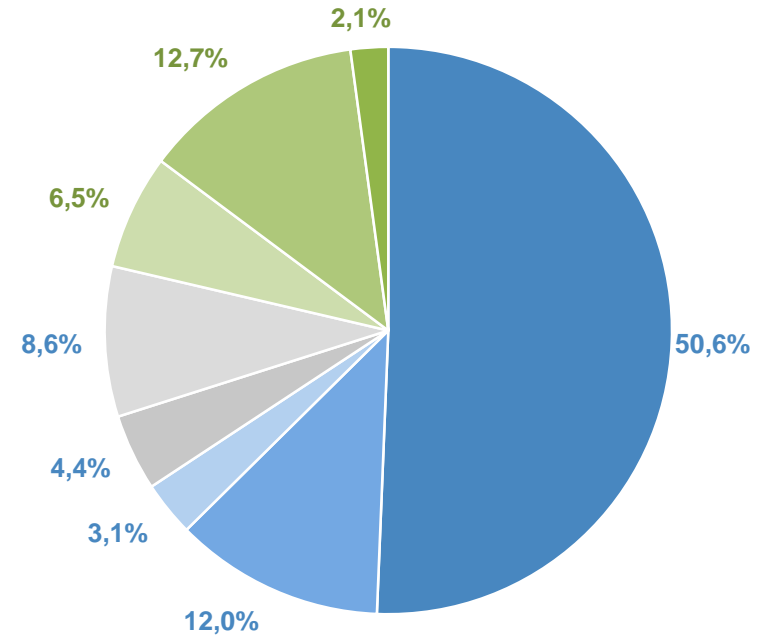
Source: Adapted from Wholesale Gas Price Survey 2015 (the International Gas Union)

Gas-on-Substitute Competition versus Gas-On-Gas Competition in the European 'Far Abroad', 1-3Q 2015

1-3 Q. 2014



1-3 Q. 2015



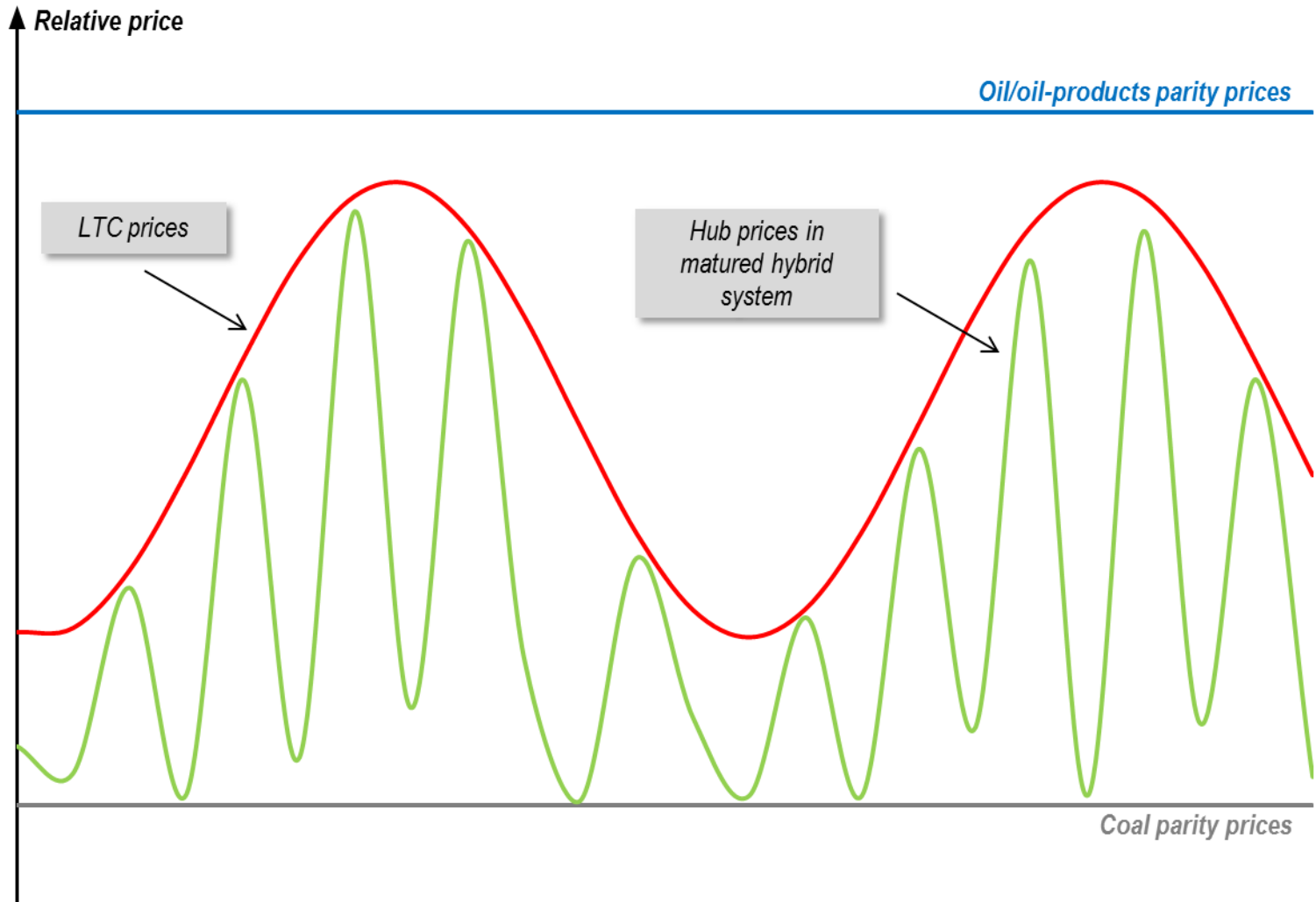
- Gazprom - oil- and quasi-oil-indexed
 - Algeria - oil-indexed
 - Libya - oil-indexed
 - Qatar - oil-indexed
 - Other - oil-indexed
 - Qatar - hub-indexed
 - Gazprom - hub-indexed
 - Other - hub-indexed
- 81,2%** (Oil-indexed categories)
- 18,8%** (Hub-indexed categories)

- Gazprom - oil- and quasi-oil-indexed
 - Algeria - oil-indexed
 - Libya - oil-indexed
 - Qatar - oil-indexed
 - Other - oil-indexed
 - Qatar - hub-indexed
 - Gazprom - hub-indexed
 - Other - hub-indexed
- 78,7%** (Oil-indexed categories)
- 21,3%** (Hub-indexed categories)

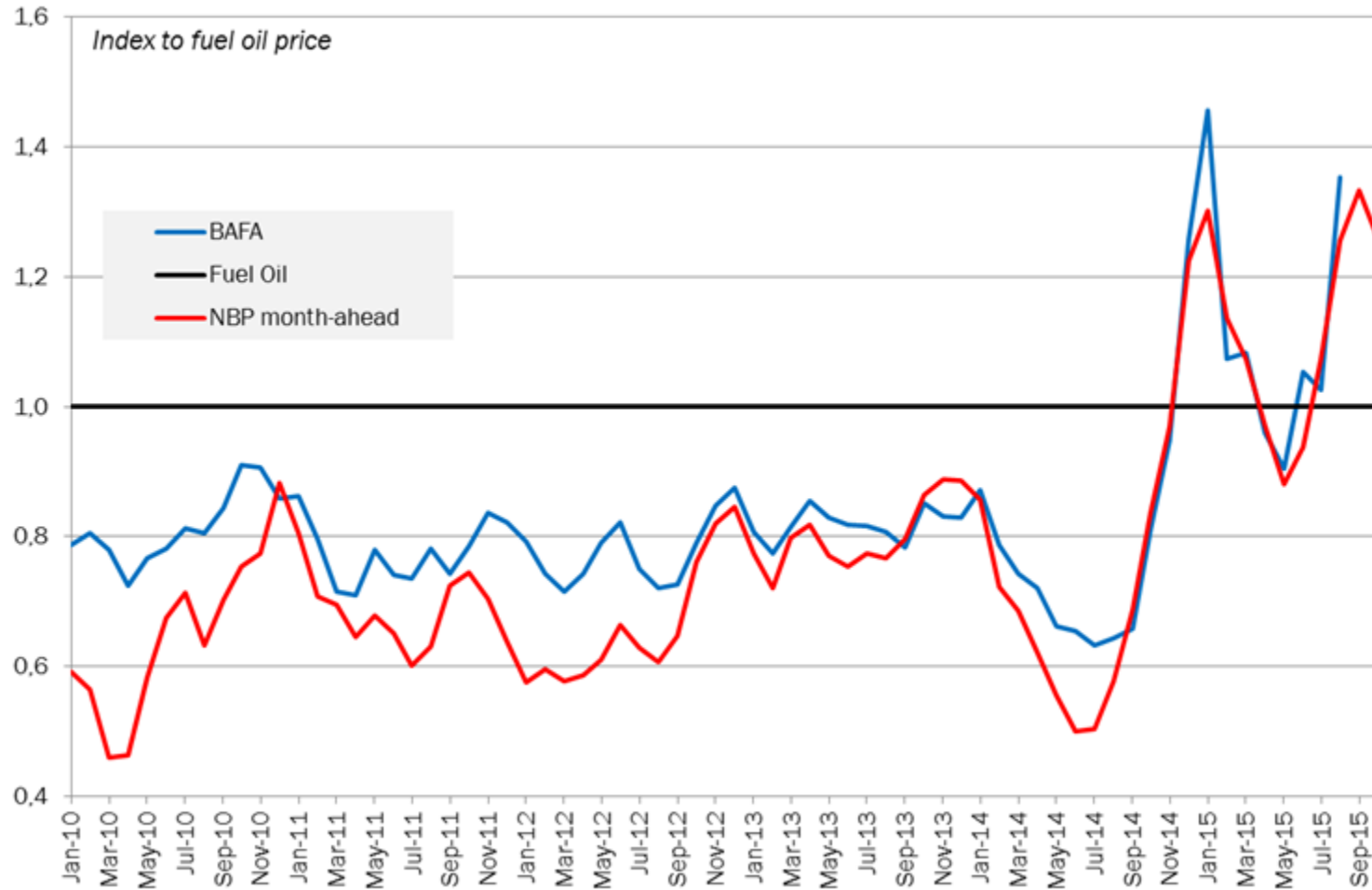
**for purposes of this comparison Norway is considered as an internal supplier*

Source: IEA, Gazprom Export LLC assessment

European Pricing Hybrid: Inter-Fuel Competition Sets Caps and Floors...



...Though when Caps and Floors Converge Extraordinary Things May Happen



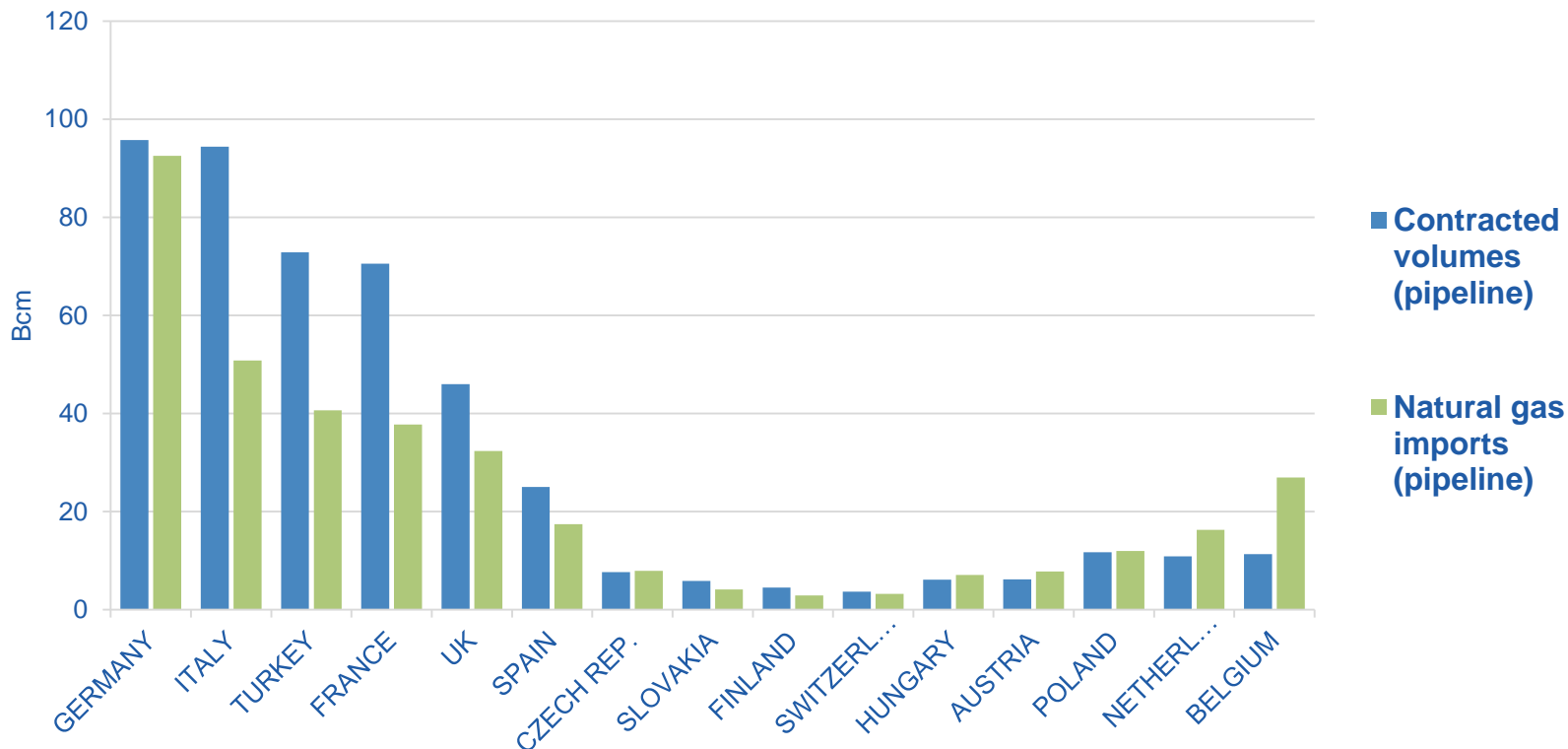
'Soft Power' Makes Hub Pricing in Europe Irresistible

Country	Effective from	Obligation to Sell Gas at Hubs	Obligatory Introduction of Spot Component in Regulated Price	Way of gas index linkage
Poland	11.09.2013	Suppliers are obliged to initially sell 30% of the previous year's import volumes through the bourse		PGNIG has to consider OTC and GASPOOL prices when putting the offers
	01.01.2014	Suppliers are obliged to initially sell 30% of the previous year's import volumes through the bourse		PGNIG has to consider OTC and GASPOOL prices when putting the offers
Romania	01.07.2014	Producers are obliged to sell 20% of domestically produced gas on the Romanian Commodities Exchange (RCE)		
Hungary	01.10.2011		Obligation to sell gas on regulated market at 70% hub-indexed prices	TTF
	01.10.2013		Obligation to sell gas on regulated market at 100% hub-indexed prices	TTF
Italy	01.04.2013		Regulated gas prices to be 20% linked to spot	TTF
	01.10.2013		Regulated gas prices to be 100% linked to spot	TTF
Belgium	01.01.2014		Oil-indexation of final gas prices must be capped at 35%	Zeebrugge
	01.01.2015		Oil-indexation of final gas prices is phased out	Zeebrugge
France	01.01.2013		Government formula applied to GdF SUEZ prices is 36% spot-linked	TTF

New Gas-Indexed Pipeline Gas LTCs Prototypes

- Hub-indexed LNG export contracts with redirection option, albeit with many reservations. EU request to give a buyer the right to change off-take points on its own discretion is unacceptable.
- Downstream short-term hub-indexed contracts in the USA and UK with limited flexibility compared to the “Groningen” LTC. The problem is with determining base-load for the intermediaries in LTCs, who are not the end-users.
- The most close proxy to the new type LTC pipeline contract are the Norwegian hub-indexed flat contracts with 100% take-or-pay clause

Adjustment #1: In the 'Old World' Volume and Price Were Detached, in the 'New World' even Over-Contracting Matters



Pipeline gas contract ACQ volume in 2014 – 487,6 bcm (-7,6% YOY)

Natural gas imports via pipeline in 2014 – 376,0 bcm (-5,0 % YOY)

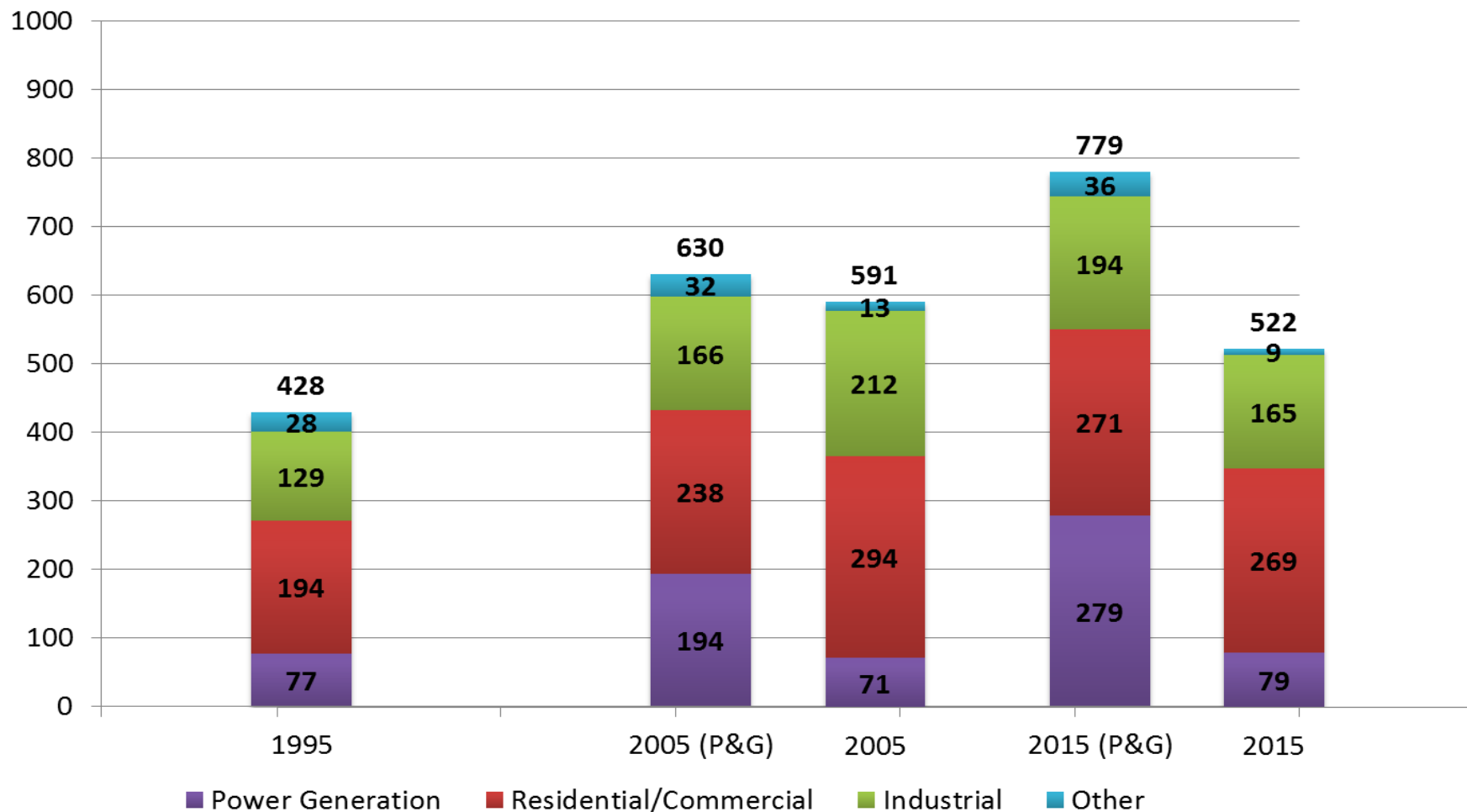


Overcontraction Index for European Market in 2014* – 1,30 (-2,25 PP YoY)

* Defined as ratio of contract ACQs to actually imported volumes

Source: Cedigaz, «Gazprom export» LLC database

Overblown Gas Demand Expectations in Europe in the Past Resulted in Over-Contracting



Source: Purvin and Gerts 1998 Forecast for 2015, Gazprom Export calculations

Adjustment #2: Buyer Nomination Rights to be Limited for Fair Risk Sharing

In "Groningen" type contract volume and price risks sharing is symmetric. Buyers and sellers were taking both price and volumetric risks, as indicated by the clause from a historic West European contract. In the 'New World' buyers claim that the distribution of risks is asymmetric with buyers taking volume and sellers price risks. In reality, on the liquid markets volume risks for buyers are nonexistent as they can dump take-or-pay volumes on the hubs thus transferring these risks to gas brokers and financial institutions

Fine for Undersupply in Percentage to Price	1 to 5		5 to 20		20 to 50		Over 50	
	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer
1991	42%	21%	52%	31%	84%	52%	104%	84%
1992	43%	21%	53%	32%	85%	53%	107%	85%
1993	39%	19%	49%	29%	78%	49%	97%	78%
1994	37%	19%	47%	28%	75%	47%	93%	75%
1995	39%	19%	49%	29%	78%	49%	97%	78%
1996	37%	19%	47%	28%	74%	47%	93%	74%
1997	33%	16%	41%	25%	65%	41%	82%	65%
Average	38%	19%	48%	29%	77%	48%	96%	77%

Source: Gazprom Export

Flexibility in Short-Term Supply Contracts in the USA Envisages Price Reward

Type of Contract	Structure of Contract
<ul style="list-style-type: none"> Baseload contracts with fixed volume 	<ul style="list-style-type: none"> The buyer and seller agree to a fixed volume. No swing is provided; additional volumes are purchased or sold by the buyer on a spot basis as needed with no additional obligation on the seller's part to sell or deliver above the baseload amount. Approximately 10% of U.S. contracts.
<ul style="list-style-type: none"> Baseload contracts with swing tolerances (1): Baseload contracts with swing component, which is incorporated to provide for flexibility in gas supply 	<ul style="list-style-type: none"> Those agreements are baseload plus swing or bundled supply to a delivery point (normally bundled gas delivery is to the gas utility interconnect with an upstream pipeline; however, it can also be a direct connect). Under these agreements baseload typically covers the anticipated load, swing covers the amount of flexibility usually needed on a day-to-day basis, and no-notice or intra-day covers buyers who want assurance of supply on a firm rather than interruptible or 'best efforts' basis. Swing tolerances are included in approximately 90% of the supply agreements in the U.S. The incremental cost and risk to the buyer in the swing contracts are twofold: <ul style="list-style-type: none"> First, the swing volumes are generally priced based on daily published spot market price indices rather than the monthly indices that are used to price baseload volumes. In most likelihood, the buyer will need to call on additional swing volumes most often during peak times (often due to cold weather) when overall market demand is high and prices are rising. In case demand is down and prices are dropping instance, they would need to pay the supplier the difference between the monthly price and the (usually lower) daily spot price on those volumes. The second cost to the buyer in the swing contracts is in the premium over the published index price that the buyer pays. Daily swing volumes command a higher premium than baseload volumes.
<ul style="list-style-type: none"> Baseload contracts with swing tolerances (2): Baseload contracts, except swing component, have no-notice or intra-day volumes 	<ul style="list-style-type: none"> No-notice or intraday swing volumes command an even higher premium, often many multiples of the premium paid for baseload volumes.

For End-Users Flexibility Has High Value while Intermediaries in the 'New World' Tend to Underestimate It Selling in Bulk on the Forward Curve and Designing Consumption Profiles when Buying Back

n	Market Share	Type of Contract	Pricing rule	Description
1	10%	Fixed volumes If Additional Demand then:	$P_1 = HH_M + \alpha_1$ $P_2 = HH_D + \alpha_1^* + \beta_1$	α_1 - for spread to HH (transport from production filed, may be <0) + margin (result of negotiations) β_1 - reflects additional costs for procuring from new supplier
2	80%	Flex ($d \leq 10\%$) If Additional Demand then:	$P = HH_M + \alpha_2$ • Like case 1 or case 2	$\alpha_2 > \alpha_1$
3	10%	No-notice Flex ($d > 10\%$) If Additional Demand then: If Demand is lower then:	$P = HH_D + \alpha_3$ • Supplier secure extra volumes $P = HH_D + \alpha_4$	$\alpha_3 \gg \alpha_2$ $\alpha_4 \ll \alpha_3$

Adjustment #3: 'Any Case' Clause Does not Correspond to the Realities of the 'New World' as it Implies Selling Gas to the Intermediaries at a Discount to Hub Prices

- When 'Any Case' clause have been agreed, commitment of the seller to secure competitiveness of the intermediary under this clause has a precise and clear-cut meaning which corresponded to the state of the European market prior to 2009.
- Three-tier natural gas industry structure made of 'exporters – importers – end-users' implied no options of selling gas to hubs in Continental Europe as they were underdeveloped at that time. 'Any Case' clause referred to capability of a buyer to distribute gas with profit further down the value chain to the end-users.
- European gas market has changed dramatically since 2009. Instead of a three-tier we have now a four-tier market structure with addition of the new class of players. These are financial investors and brokers operating on the liquid hubs in North-West Europe. Guarantee to sell gas to these market players at an assured profit is an excessively broad interpretation of the GPE old commitments.
- Price review clause in the LTCs has to be redone in order to lift GPE from the excessive burden.

Playing 'Jenga' Game with European Gas LTCs is Risky Exercise

Pricing paradigm change requires a profound redesign of the "Groningen" type LTCs.

Price revisions are not sufficient enough to upgrade existing contracts to the 'New World' challenges while ignoring supplier's interests will have destructive consequences for the EU energy security.





THANK YOU FOR YOUR ATTENTION!