

EUROPEAN GAS PRICE FORMATION: REALITIES AND PERSPECTIVES



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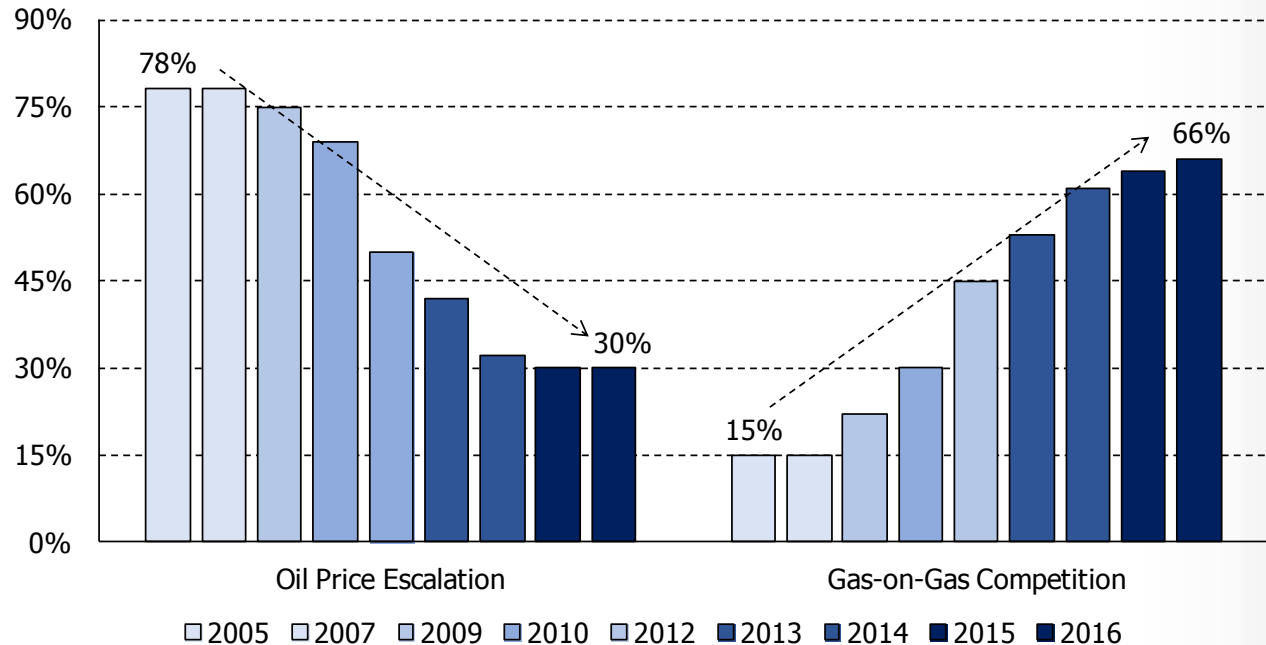
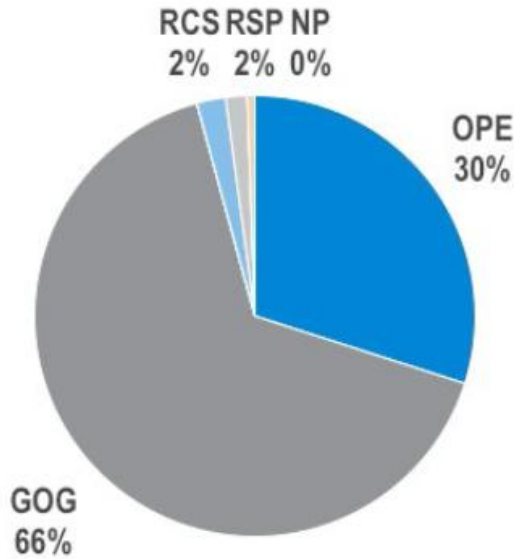
European gas price formation development



Gas-on-gas competition (GOG): LTCs with gas spot price-indexation; OTC and Exchange gas hub-based pricing

Oil Price Escalation (OPE): LTCs with gas oil-indexed price

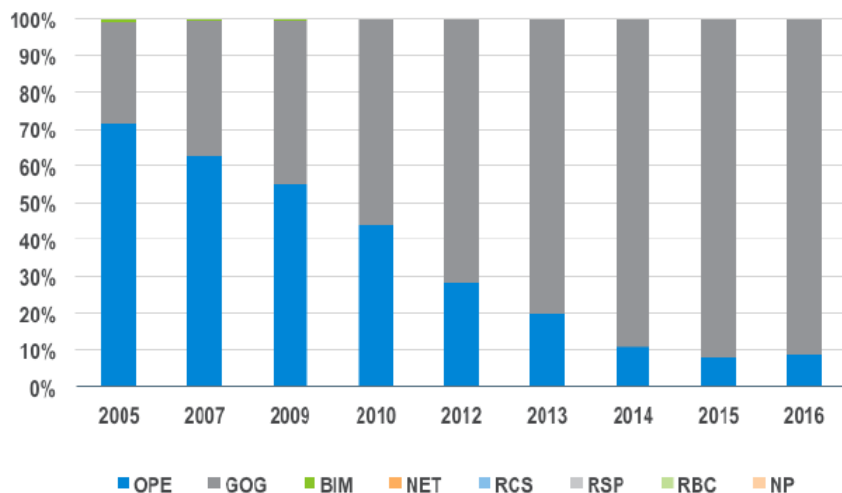
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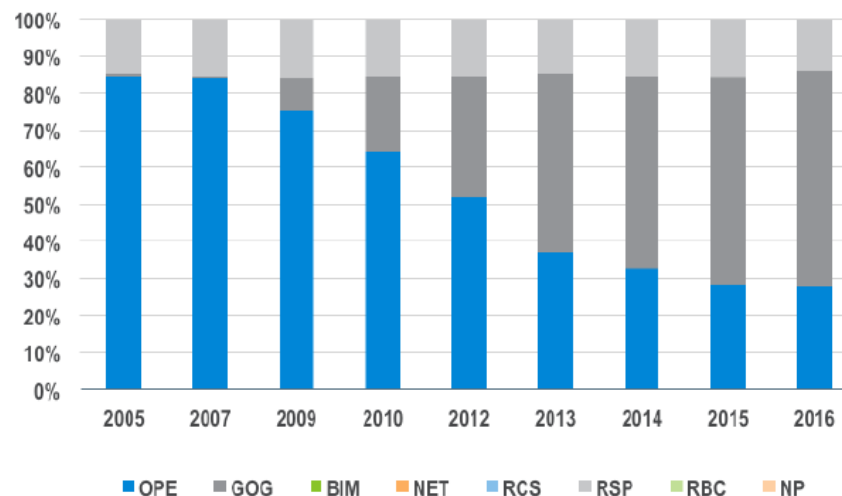
European gas price formation development



Northwest Europe



Central Europe



Source: International Gas Union Wholesale gas price formation

Gas hubs and energy exchanges development

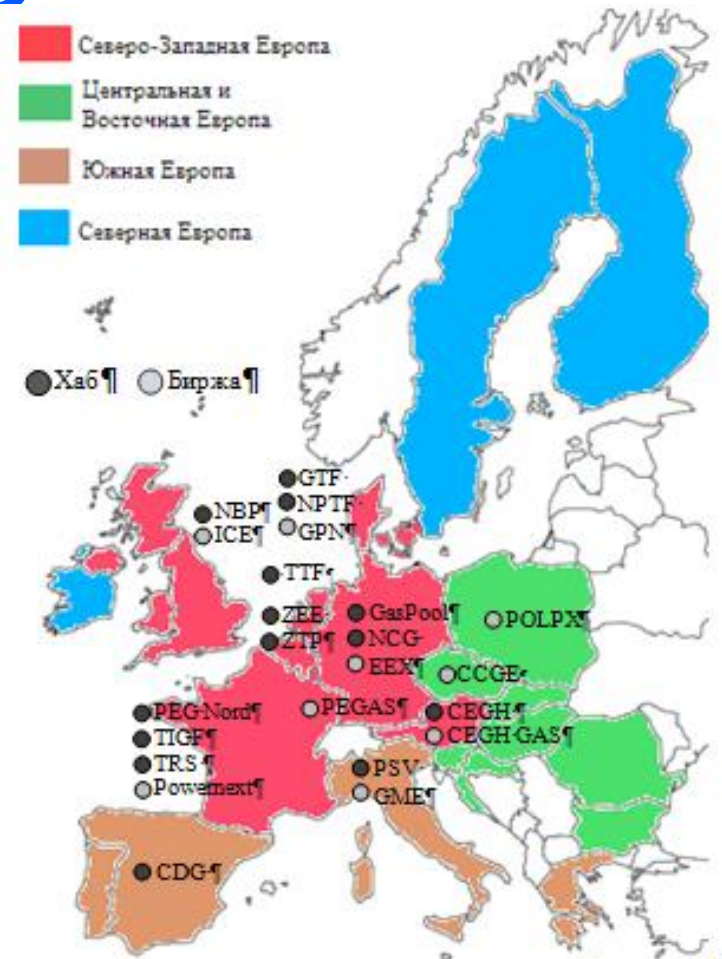


Northwest and South Europe:

- ☞ 15 gas hubs – 2 are liquid (TTF in the Netherlands and NBP in the UK)
- ☞ 6 energy exchanges – 1 is regional

Central Europe:

- ☞ 4 gas hubs
- ☞ 3 energy exchanges



Gas hubs and energy exchanges development

Country	Energy Exchange	Gas hubs
Northwest Europe		
UK	InterContinental Exchange (ICE)	NBP, TTF
France	Powernext	PEG Nord, TTF
Germany	European Energy Exchange (EEX)	TTF, NCG, GPL
PEGAS – regional exchange (Powernext and EEX Alliance)		Spot: CEGH VTP, ETF, GPL, NCG, PEG Nord, TRS, TTF, ZTP Futures: CEGH VTP, ETF, GPL, NCG, PEG Nord, PSV, PSV Fin, TRS, TTF, ZEE, ZTP
Denmark	Gas Point Nordic (GPN, ранее - Nord Pool Gas)	GTF, NPTF
Italy	Gestore Mercati Energetici (GME)	PSV / PSV fin
Central Europe		
Austria	Central European Gas Hub GAS Exchange (CEGH GAS Exchange)	CEGH-VTP
Poland	Polish Power Exchange (POLPX)	VTP
Czech	Central Czech Gas Exchange	-

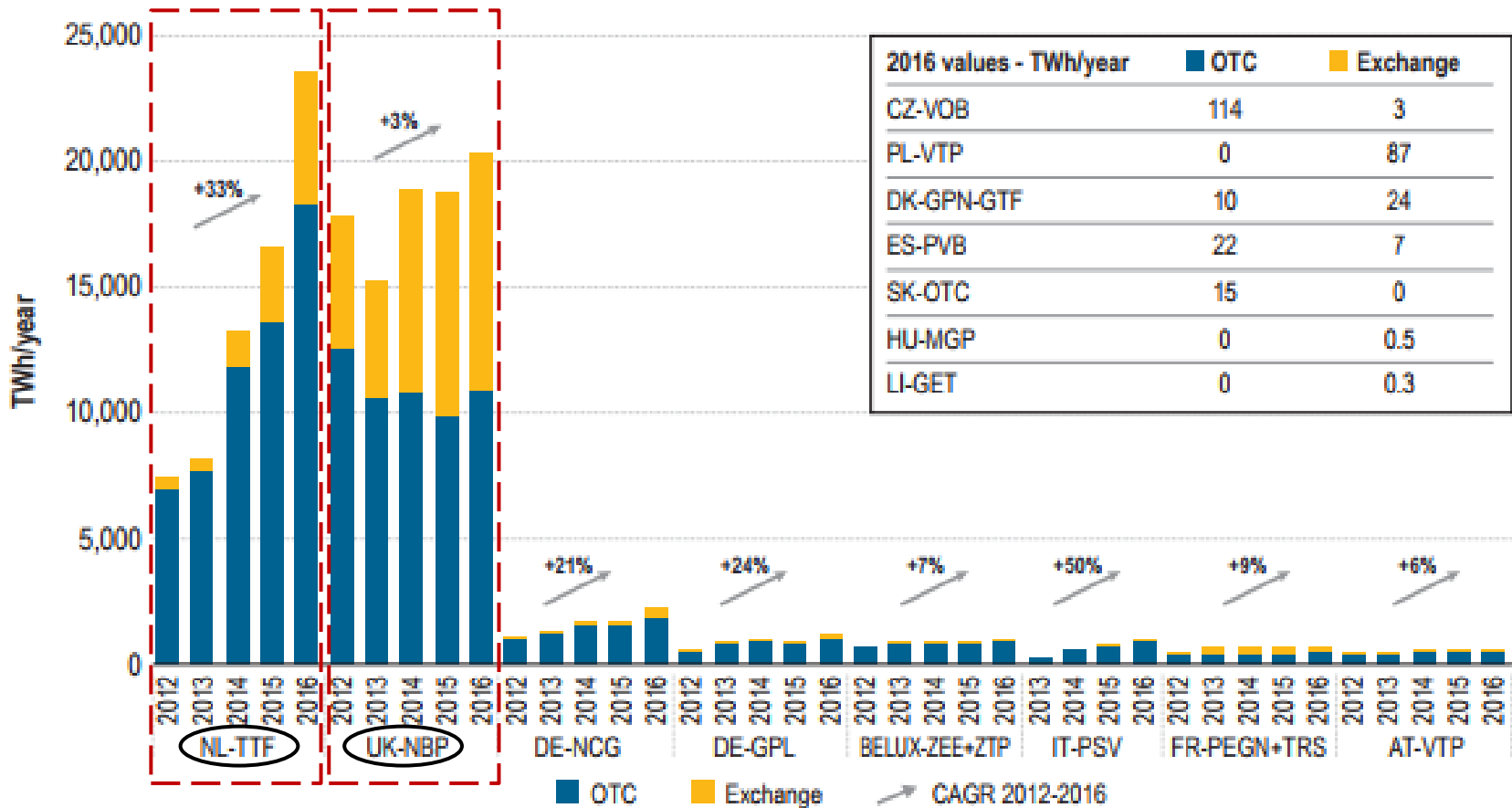
OTC and Exchange gas hubs trading: clearing houses guarantee reliability



A basic difference between OTC trading and exchange trading is that trading on the exchange takes place anonymously and the counterparty risk is managed by the exchange, i.e. the exchange – or its clearing house – guarantees that the other side of the transaction performs to its obligations.

Exchanges	OTC
<ul style="list-style-type: none"> ✓ Clearing houses: market risk ✓ Spot and futures ✓ Pricing: standardized ✓ Quantity: standardized ✓ Maturity: standardized ✓ Quality: standardized ✓ Documentation: standardized 	<ul style="list-style-type: none"> × NO Clearing houses: market risk & counterparty risk ✓ Forward and options ✓ Pricing: customized ✓ Quantity: customized ✓ Maturity: customized ✓ Quality: customized ✓ Documentation: customized

OTC and Exchange gas hubs trading: OTC is the favored trading method

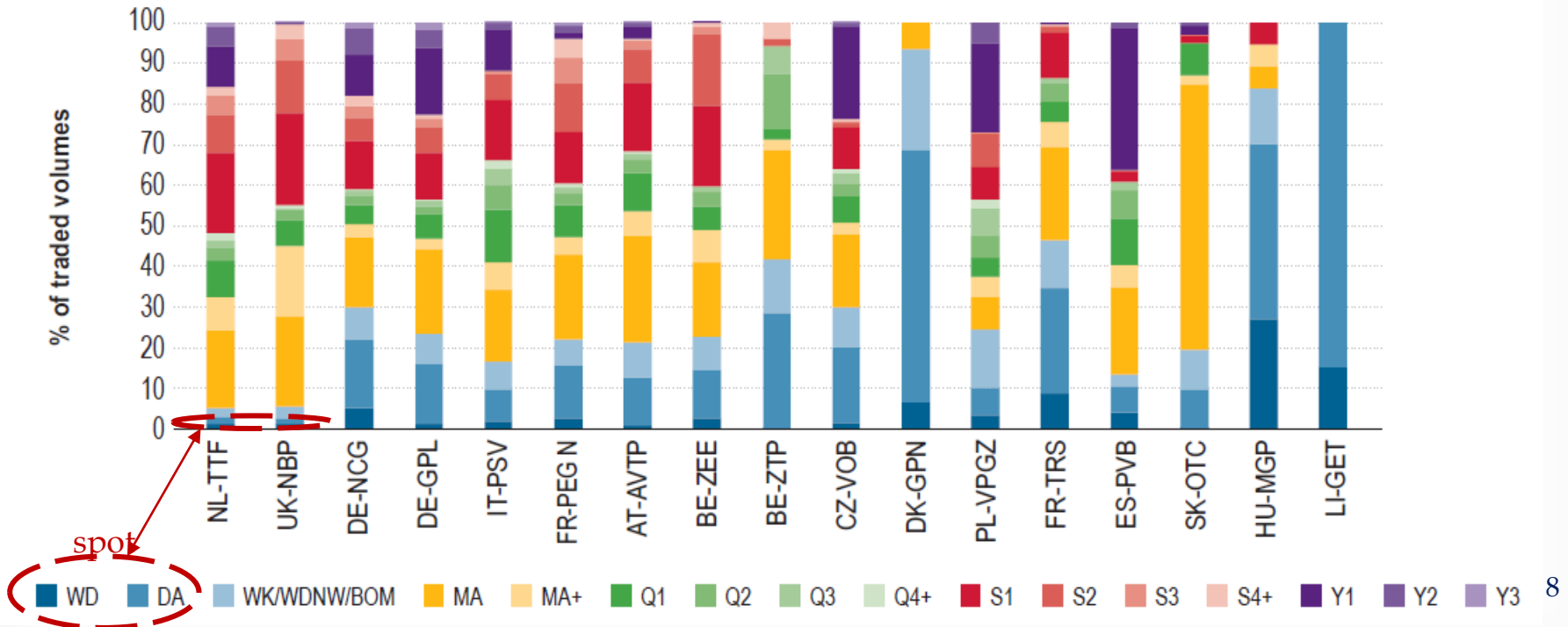


Source: ACER Market Monitoring Report

OTC and Exchange gas hub trading: only a tiny share of spot trading



Spot products are mainly used for physical portfolio optimization close to delivery, short-term price arbitrage and/or balancing purposes. Other products not only assist the supply portfolio and risk hedging over the prompt horizon, but also tend to attract most of the speculative trading as these products tend to be more price-volatile as well as offer a good number of counterparties.

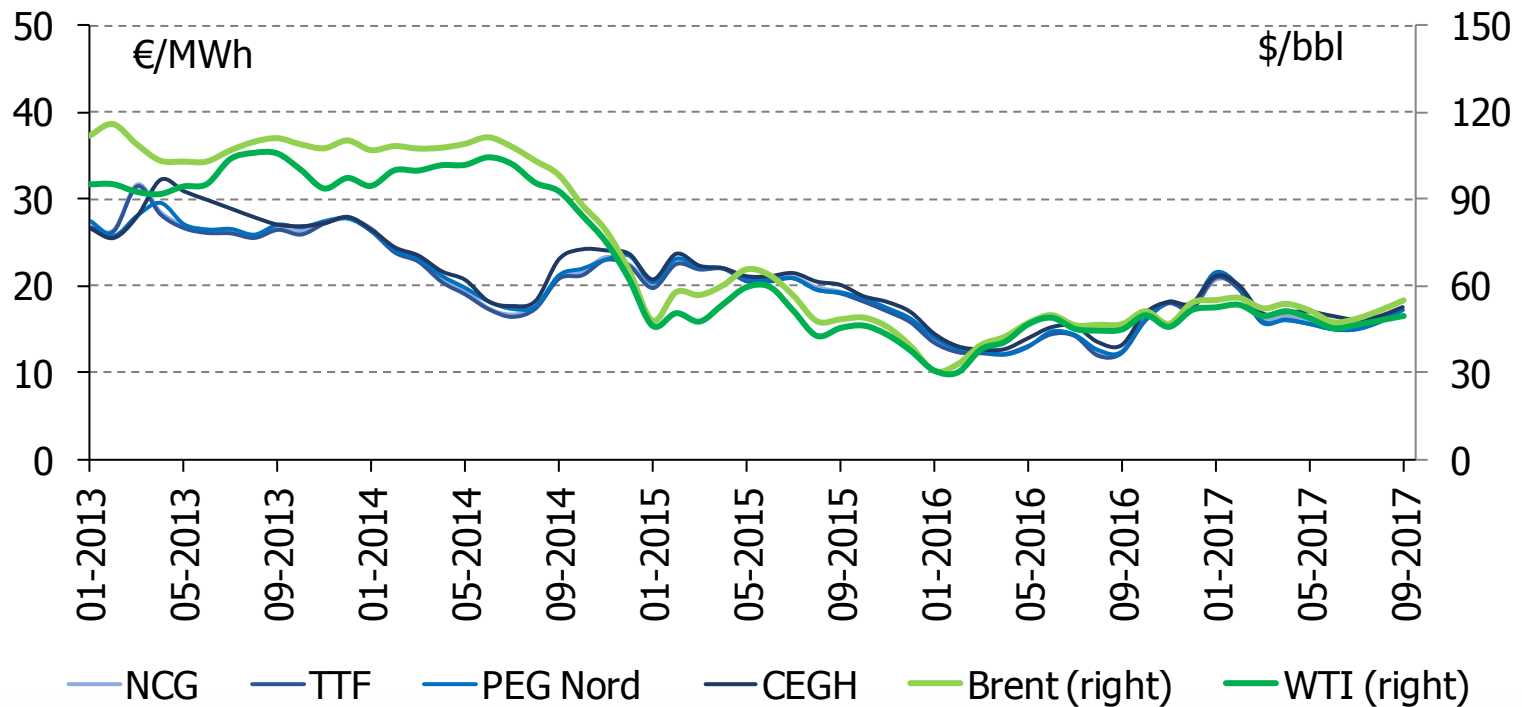


Crude oil prices and exchange spot hub-based pricing correlation



Crude oil Brent and WTI prices stood at \$55/bbl and \$50/bbl in September 2017

Oil prices fell by 50% from August 2014

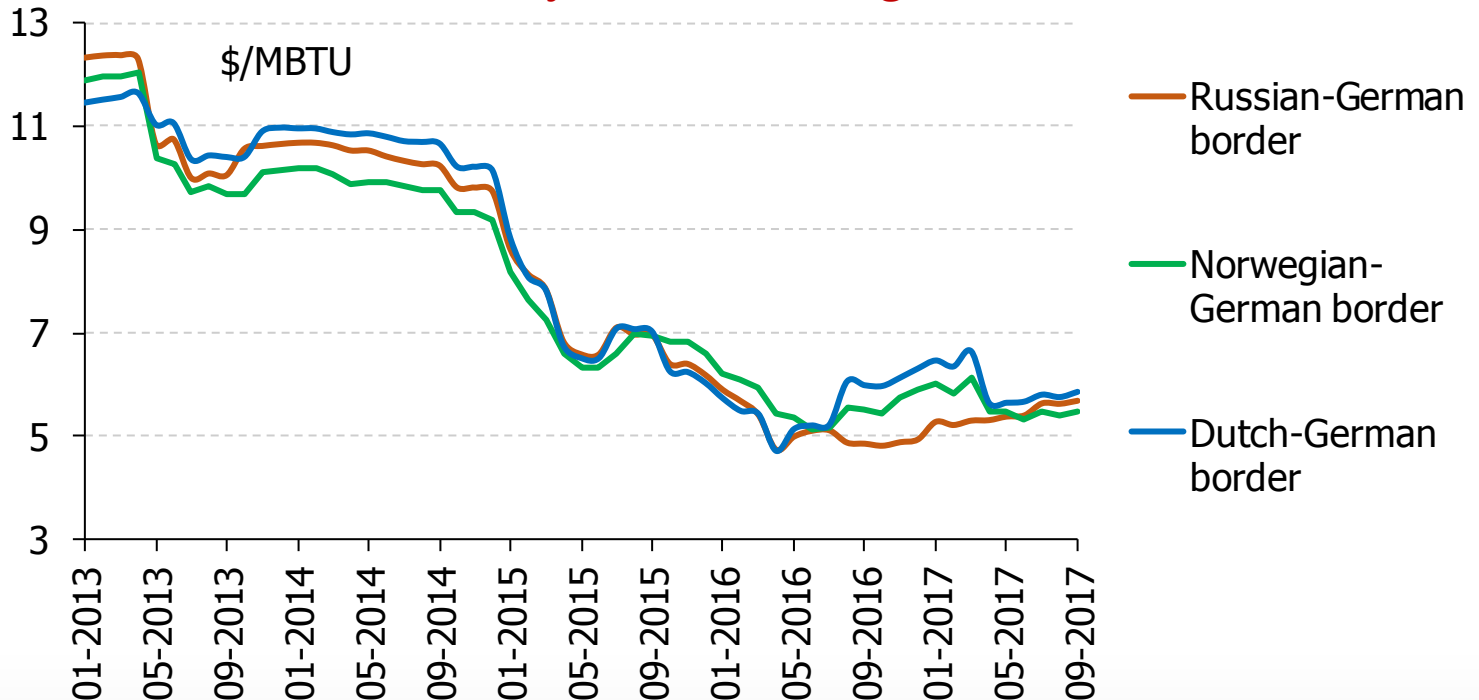


LTC gas prices with oil-indexation and spot price-indexation



Contractual gas prices between EU consumers and Russian shipper stood at \$5,7/MBTU, Norwegian shipper - \$5,5/MBTU, Dutch shipper - \$5,9/MBTU in September 2017

Prices fell by 45% from August 2014

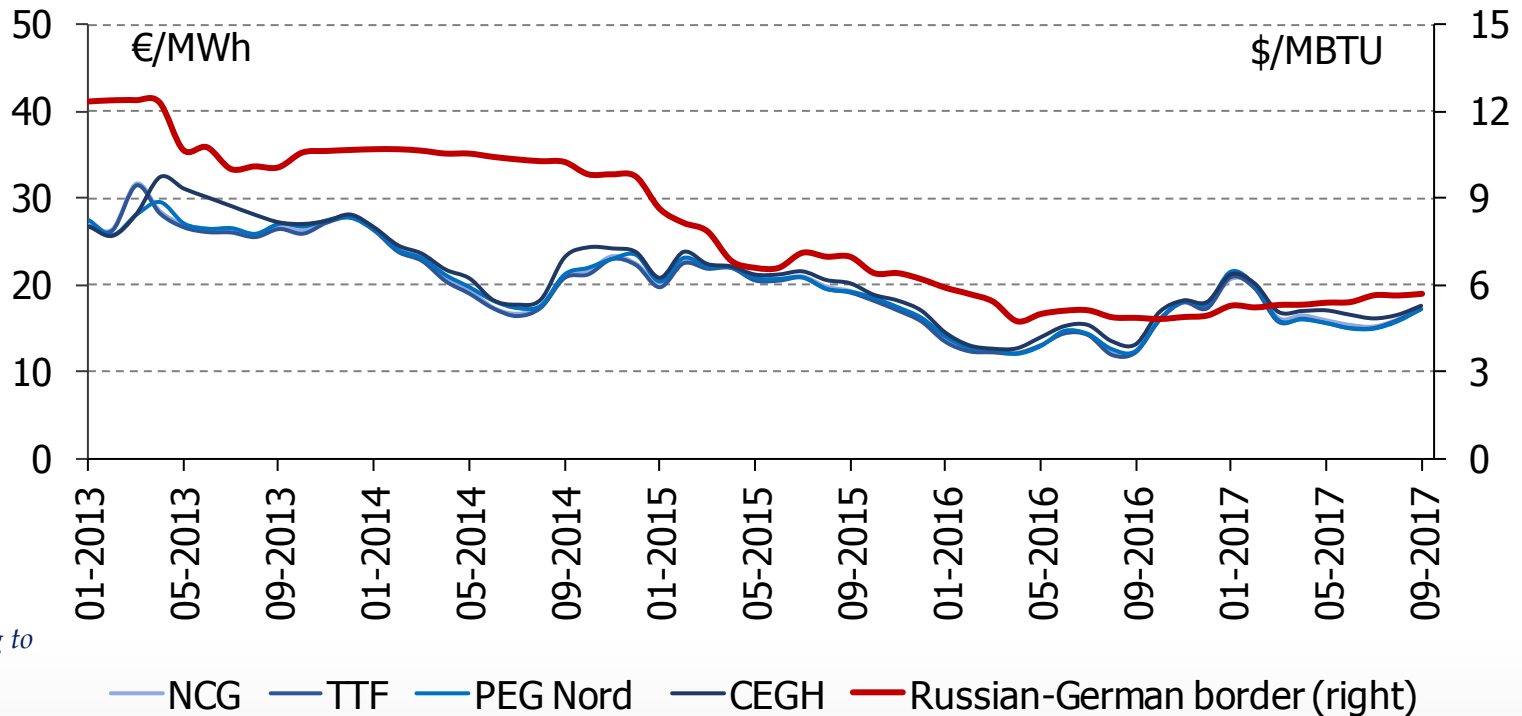


Exchange spot hub-based prices vs. Russian LTC gas price



Russian contractual gas price (\$5,1/MBTU) was lower than Norwegian (\$5,6/MBTU) and Dutch (\$5,6/MBTU) by 9% in 2016

Russian gas deliveries amounted to 178 bcm in 2016 (+13% YoY)

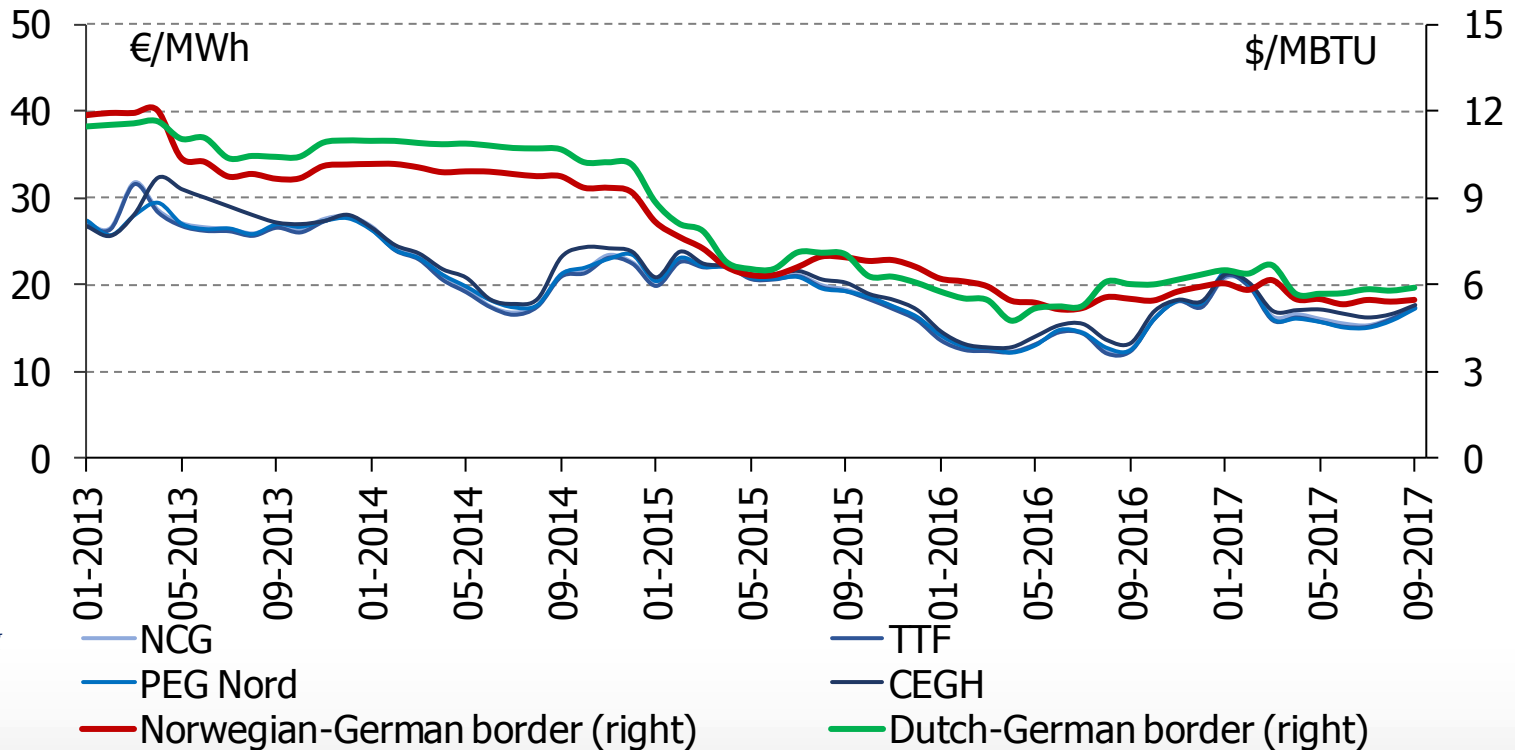


Exchange spot hub-based prices vs. Norwegian and Dutch LTC gas prices



Russian contractual gas price (\$5,1/MBTU) was lower than Norwegian (\$5,6/MBTU) and Dutch (\$5,6/MBTU) by 9% in 2016

Norwegian gas deliveries amounted to 124 bcm in 2016 (+7,5% YoY), Dutch - 14,5 bcm (-70% YoY)



Source: according to Powernext, EEX, CEGH, Heren



Thank you!



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