

26th World Gas Conference

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PGCB – Sub Group 2

Wholesale Gas Price Formation

Presentation to Thematic Session – Part 1

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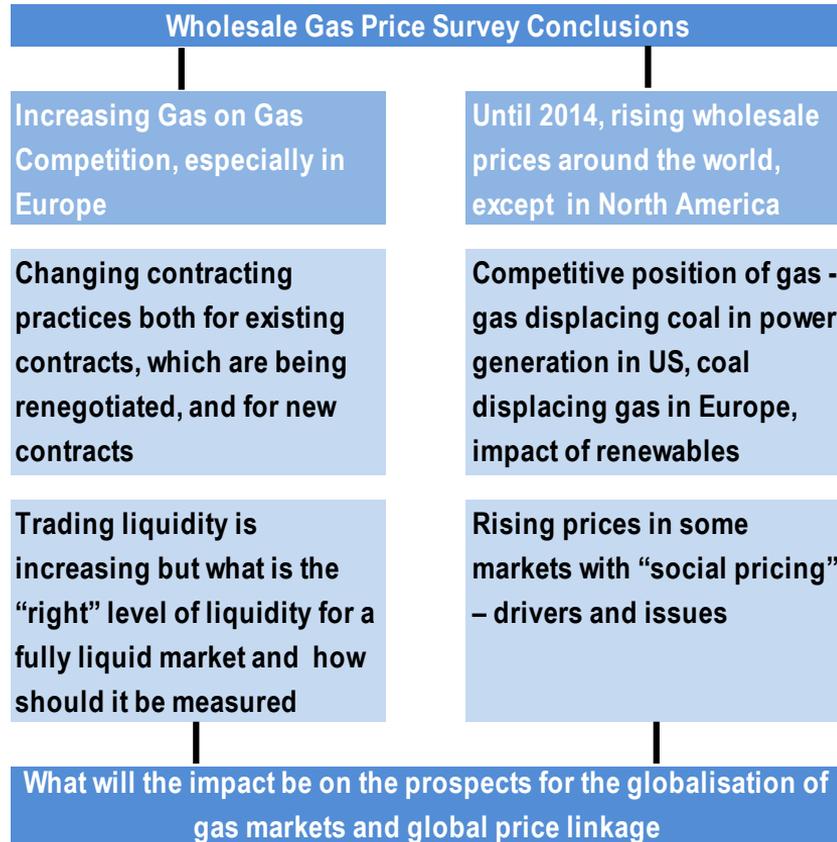
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Introduction



The report structure is driven by the conclusions of the wholesale gas price survey....

.....highlighting the key elements.....

.....and concluding with discussion of gas market globalisation and price linkage

Wholesale Gas Price Survey



International Gas Union
News, views and knowledge on gas – worldwide



Wholesale Gas Price Survey - 2015 Edition

- A global review of price formation mechanisms 2005 - 2014



- Objective to establish baseline survey on wholesale price formation mechanisms around the world
- IGU members provided the data for over 100 countries, and Nexant have collated and analysed them
- First undertaken for the year 2005 and was repeated for 2007 – reported at WGC in 2009 in Buenos Aires
- Surveys for 2009 and 2010 undertaken for the Kuala Lumpur triennium
- 2014 survey is third in the Paris triennium after the 2012 and 2013 surveys
- In the 2014 survey responses were received for some 71 out of 109 countries, but these responses covered 94% of total world consumption
- Focus on wholesale prices (broadly defined) – hub, border, wellhead, city-gate

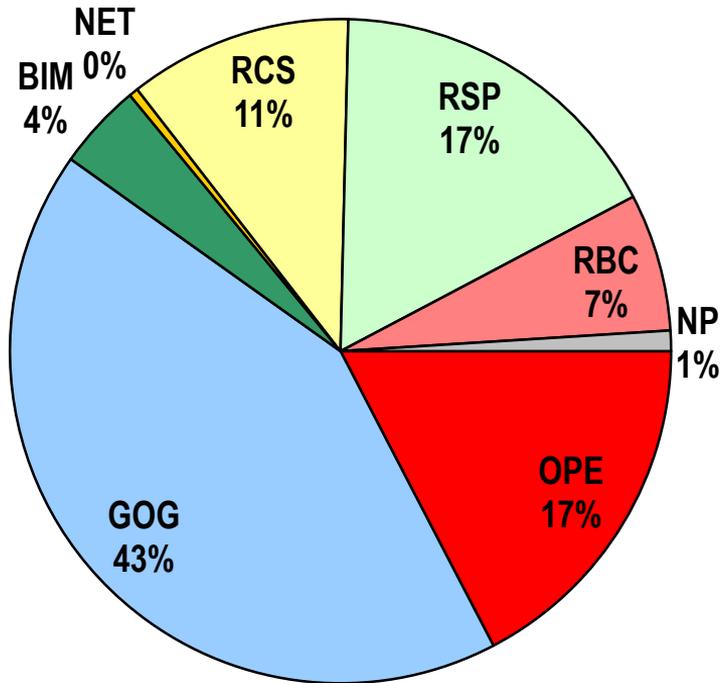
Different Types of Price Formation Mechanisms

Oil Price Escalation	OPE	The price is linked, usually through a base price and an escalation clause, to competing fuels, typically crude oil, gas oil and/or fuel oil. In some cases coal prices can be used as can electricity prices.
Gas-on-Gas Competition	GOG	The price is determined by the interplay of supply and demand – gas-on-gas competition – and is traded over a variety of different periods (daily, monthly, annually or other periods).
Bilateral Monopoly	BIM	The price is determined by bilateral discussions and agreements between a large seller and a large buyer, with the price being fixed for a period of time – typically this would be one year.
Netback from Final Product	NET	The price received by the gas supplier is a function of the price received by the buyer for the final product the buyer produces. This may occur where the gas is used as a feedstock in chemical plants.
Regulation Cost of Service	RCS	The price is determined, or approved, by a regulatory authority, or possibly a Ministry, but the level is set to cover the “cost of service”, including the recovery of investment and a reasonable rate of return.
Regulation Social and Political	RSP	The price is set, on an irregular basis, probably by a Ministry, on a political/social basis, in response to the need to cover increasing costs, or possibly as a revenue raising exercise.
Regulation Below Cost	RBC	The price is knowingly set below the average cost of producing and transporting the gas often as a form of state subsidy to its population.
No Price	NP	The gas produced is either flared, or provided free to the population and industry, possibly as a feedstock for chemical and fertilizer plants.
Not Known	NK	No data or evidence.

IGU Regions

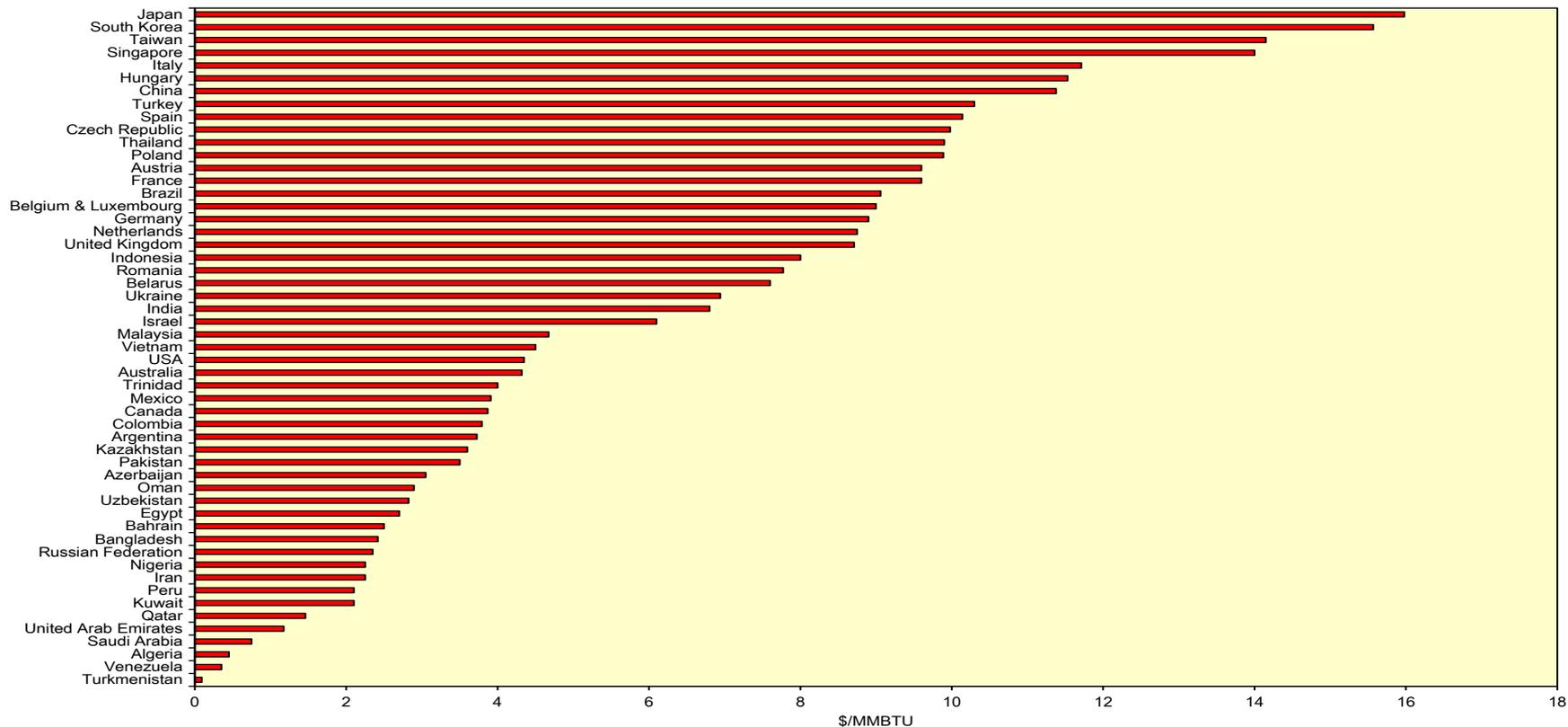


World Price Formation - 2014

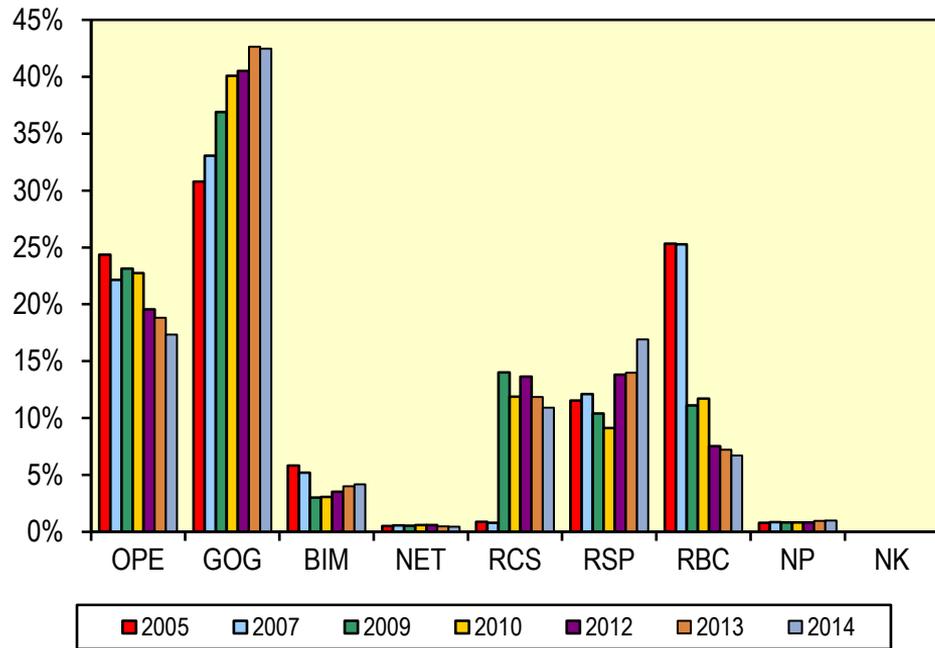


- GOG dominated by North America, followed by Europe and FSU
- OPE predominantly Asia Pacific, Europe and Asia
- Regulated categories total some 35% - mainly FSU, Asia, Middle East and Africa

Wholesale Price Levels - 2014

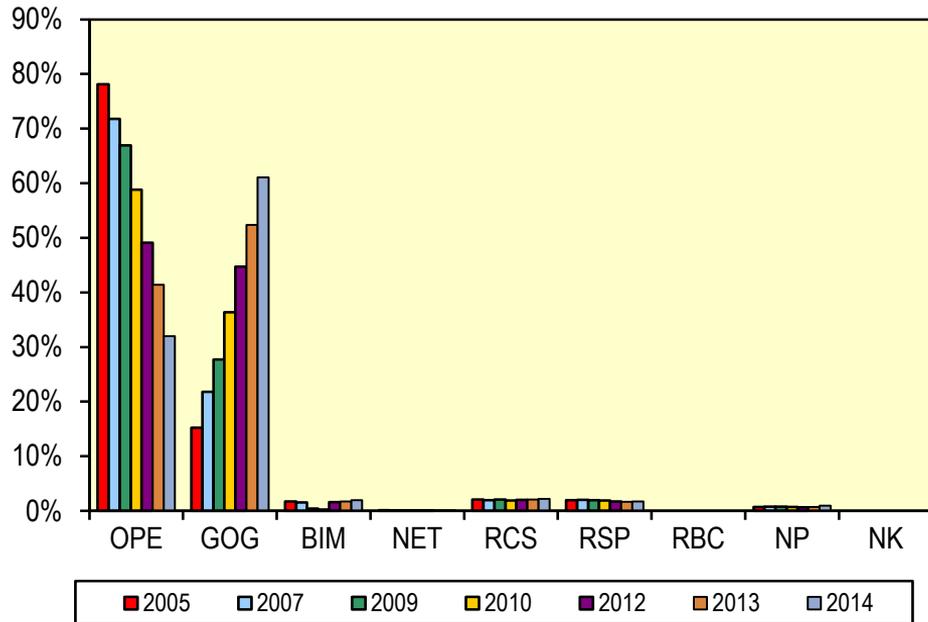


World Price Formation – 2005 to 2014



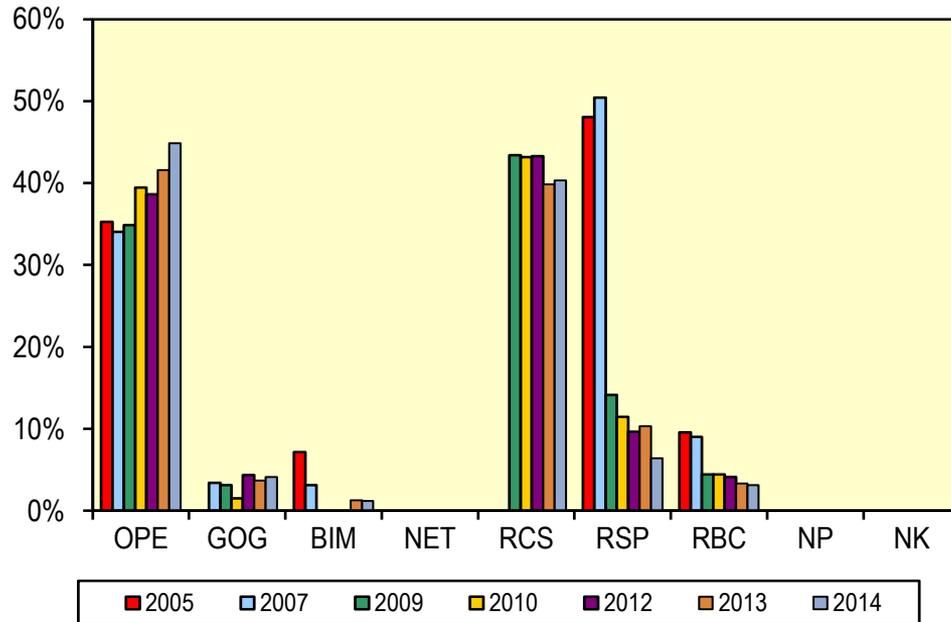
- 2005 to 2014 GOG up by 12 %age points, OPE down 7 %age points
- Switch from RBC to RCS and RSP
- Between 2013 and 2014 GOG unchanged
 - Increase in share in Europe, faster consumption growth in NA offset by lower share in Russia

Europe Price Formation – 2005 to 2014



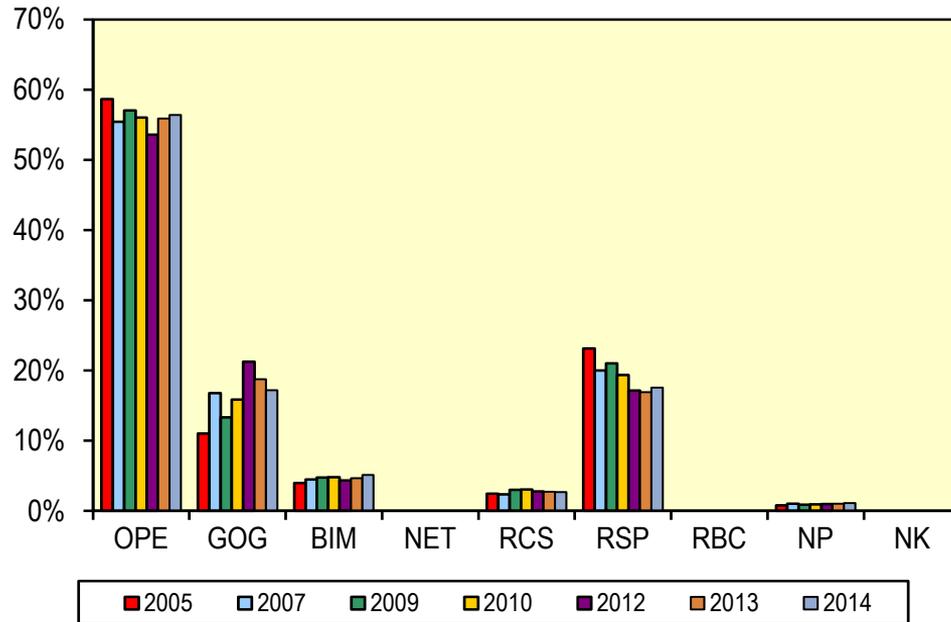
- GOG up from 15% on 2005 to 61% on 2014
- OPE down from 78% in 2005 to 31% in 2014
- Predominantly Northwest Europe and, latterly, Central Europe
- Much less change in other areas such as Mediterranean and almost no GOG in Southeast Europe

Asia Price Formation – 2005 to 2014



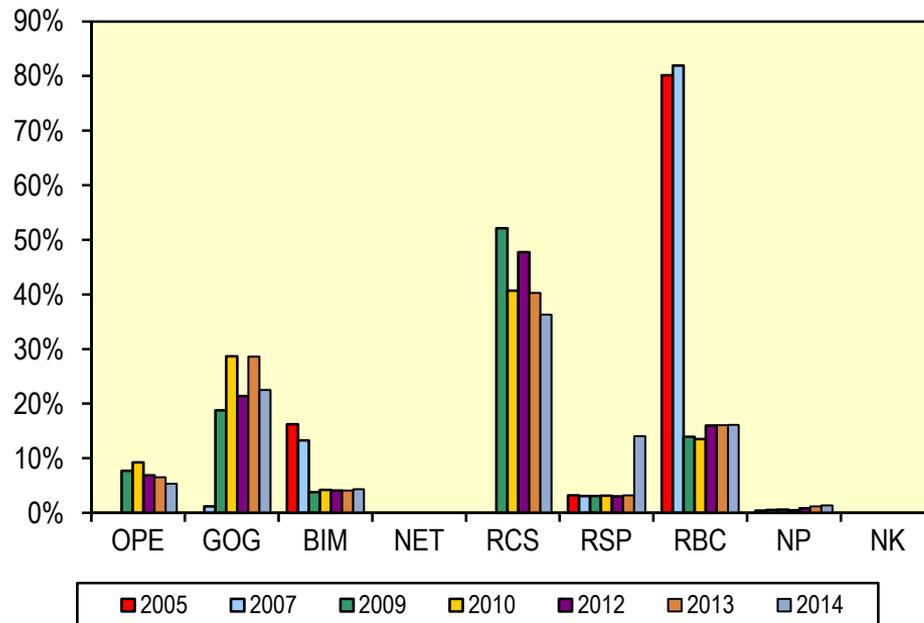
- Asia has seen gains in OPE from 35% in 2005 to 45% in 2014
- Increasing imports of both LNG and pipeline gas from Turkmenistan into China and the start of pricing reforms for domestic gas
- Beginnings of GOG at end of 2014 in India with domestic pricing reform

Asia Pacific Price Formation – 2005 to 2014



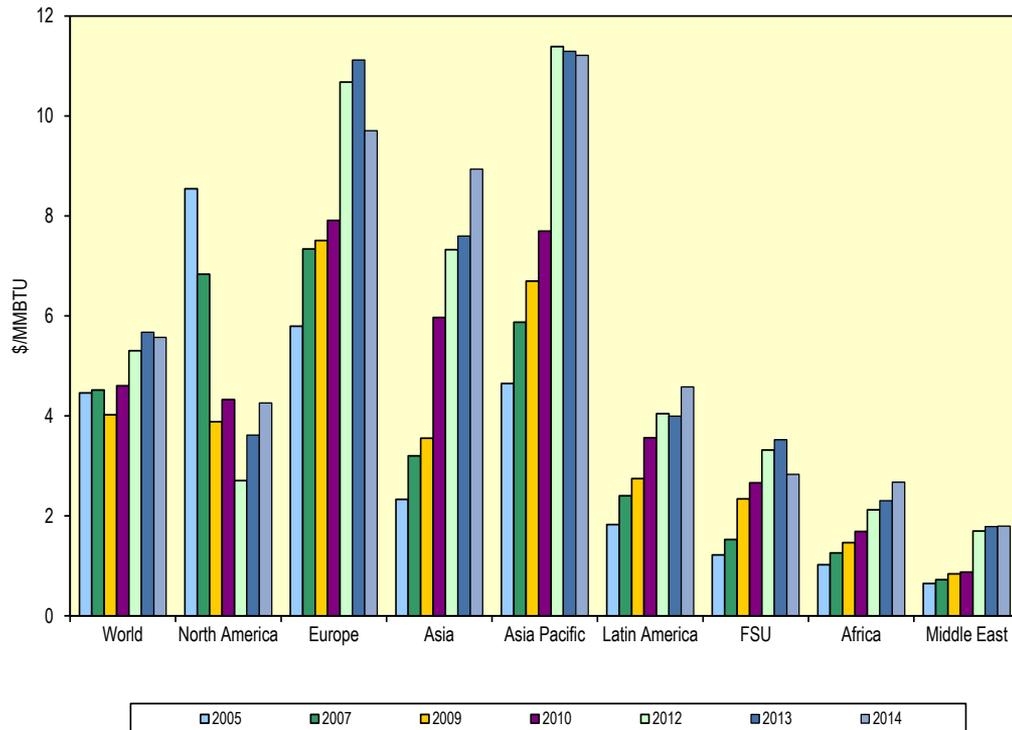
- Asia Pacific – relative stability
- Slight move to GOG reflects increasing volumes of spot LNG
- Regulated pricing in Indonesia and Malaysia

FSU Price Formation – 2005 to 2014



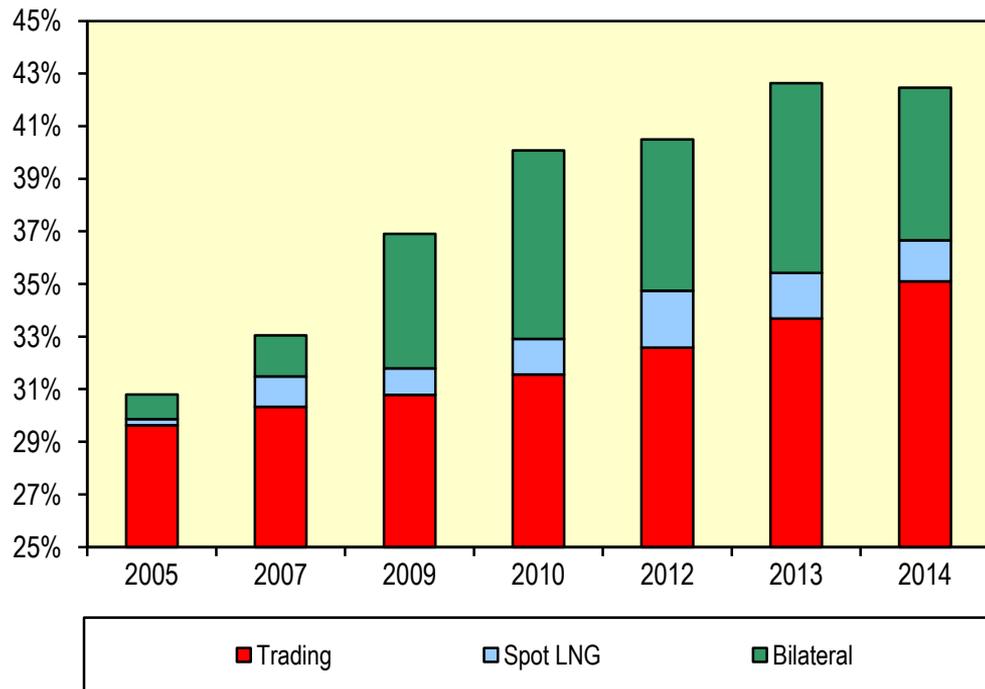
- Move to GOG away from regulation in Russia as Independents allowed to compete with Gazprom
- Rising regulated prices in Russia saw switch from RBC to RCS but freeze in prices in 2014 saw partial switch back to RSP
- Intra-FSU trade switch from annually negotiated BIM to OPE

Wholesale Price Levels by Region – 2005 to 2014



- Rising prices in Europe and Asia Pacific well documented
- Sharp rise in Asia prices as China imports more and regulated prices increased
- Rise in regulated prices in other regions as well as subsidies reduced or eliminated

Changes in Gas on Gas Competition – 2005 to 2014



- Different types of GOG
 - Trading
 - Spot LNG
 - Bilateral Negotiation
- 12 % point rise between 2005 and 2014
 - 5.5% from Trading
 - 5% from Bilateral
 - 1.5% from Spot LNG
- Rise in Trading entirely Europe

Changing Contracting Practices

Arguments For and Against Oil Price Escalation

Arguments in favour of OPE

- Competition between oil and gas (on the supply and demand side)
- Resource value of hydrocarbons
- Pricing via a third commodity
- Oil prices have lower volatility
- Higher confidence in the tradability of oil
- Shareholders prefer oil price related risk
- High level of acceptance
- Easier to hedge oil prices due to more liquid oil derivatives (outside the US)
- Easier to get financing with OPE LTCs
- Investment decisions by producers more linked to oil prices than gas prices

Arguments against OPE

- Oil and gas are separate markets
- Oil and gas are no longer substitutes in many end user markets, especially power
- Other alternatives to oil indexation are available
- Political support for change
- Political support for short term contracts
- Better interconnection between regional gas markets
- Reduced fear of market power as markets are more competitive

Changing Contracting Practices

Transition to GOG in Existing Contracts in Europe

- Commodity Pricing
 - Month Ahead / Day Ahead pricing
- Contract Duration
 - Fewer long term contracts
- Flexibility
 - Less swing
- Delivery Point
 - Border to hub
- Security of Supply / Demand
 - Liquid hubs or long term contracts?
- Renegotiation Clauses
 - No need for price reviews?

Changing Contracting Practices

Other Developments Outside Europe

- Price Transparency
 - Price assessments / METI spot prices
- Globalization of Pricing
 - Henry Hub pricing coming to a market near you!
- Buyers Going Upstream
 - Asian buyers investing in E&P – linked to offtake rights
- Unbundling LNG Contracts
 - Tolling and FOB lifting in US export arrangements

Trading Hubs and Liquidity

Development of Trading Hubs

- Market Size and Diversity
- Regulatory Change
- Effective Gas Release
- Access to and Availability of Capacity
- Unbundling
- Harmonisation and Standardisation

Trading Hubs and Liquidity

Liquidity at Trading Hubs

	Physical delivered volumes							
	NBP	Zeebrugge	TTF	PSV	PEG's	GASPOOL	CEGH	NCG
2007	66.8	7.9	7.4	6.8	5.1	2.2	6.9	4.1
2008	66.6	9.1	18.7	7.7	6.6	4.4	5.2	14.4
2009	74.6	12.9	25.0	11.0	8.1	12.9	7.6	25.0
2010	95.8	16.7	31.3	21.5	8.7	29.6	10.9	31.3
2011	79.6	14.3	35.6	23.0	12.8	29.6	11.6	35.5
2012	85.6	12.6	39.6	25.9	17.0	35.0	13.4	42.3
2013	85.4	16.8	42.5	25.3	16.3	40.0	9.7	47.4

	Net traded/nominated volumes							
	NBP	Zeebrugge	TTF	PSV	PEG's	GASPOOL	CEGH	NCG
2007	902.6	40.2	27.6	11.5	11.1	4.8	17.7	6.6
2008	960.8	45.4	60.5	15.6	16.5	9.7	14.9	25.3
2009	1016.1	64.9	73.6	23.5	23.1	28.6	22.8	56.0
2010	1095.5	65.2	106.5	43.1	27.8	65.0	34.1	84.1
2011	1137.2	69.3	151.7	57.7	39.8	75.8	39.2	108.5
2012	1271.0	66.6	187.9	64.7	46.3	88.3	47.3	133.1
2013	1094.0	69.4	786.9*	65.8	55.5	112.6	35.4	152.7

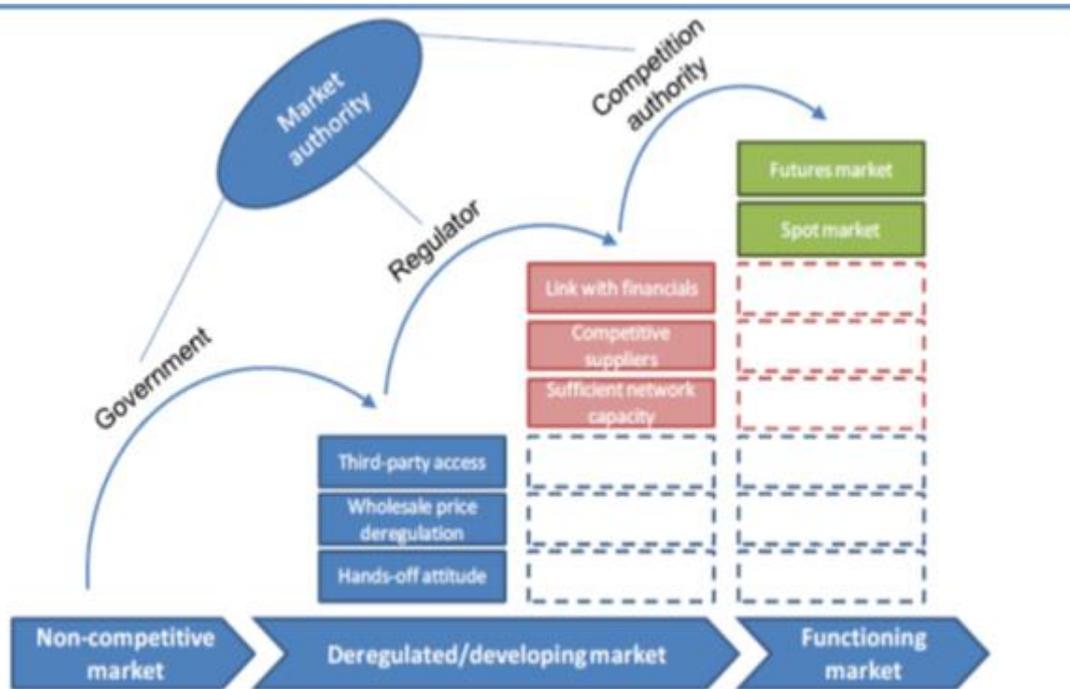
Note*: As of January 2013, the Dutch TSO GTS began to report only total traded volumes, including OTC trades. As other TSOs still report the nominated volumes, an equal comparison between TTF and the other European hub could not be made with the data currently available.

Sources: TSOs and regulators.

- Churn rates – taken from IEA MTGMR 2014
- Bid – Offer Spreads
- Market Depth
- Tradability Indices

Trading Hubs and Liquidity

Development of a Trading Hub in Asia



- IEA 2013 report – steps to creating a competitive wholesale natural gas market
- Issues in Asia
 - LNG much more difficult to trade than pipeline gas
 - Lack of liberalised and competitive domestic markets
 - Price transparency is improving slowly with reporting agencies price indices and the METI data but a long way to go on price discovery