

**Secondary and short term
natural gas markets
– International experiences**

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Contents

- Scope of work for secondary markets workstream
- Commodity trading institutions and arrangements
- Roles and responsibilities
- Liquidity and capacity rights
- Issues in Colombia
- Conclusions

Work stream: Secondary and short term natural gas markets

- The objective of this work stream is to design secondary and short-term natural gas markets for Colombia;
- The market design should:
 - ◆ Take into account lessons from international experience;
 - ◆ Account for the relevant specific features of the Colombian gas market;
 - ◆ Balance the costs of transition to new market arrangements against future benefits;
 - ◆ Describe the main institutions, roles, responsibilities and information flows on the proposed markets;
 - ◆ Be compatible with the primary gas market auctions.
- *This presentation focuses on international experience in secondary gas market design.*

Contents

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- Roles and responsibilities
- Liquidity and capacity rights
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Commodity trading institutions and arrangements

- *Bilateral trades*
 - ◆ Tailored trades;
 - ◆ All key terms (duration, delivery point, credit terms, default etc.) defined for each contract.
- *Over-the-counter (OTC) trading*
 - ◆ Bilateral trading of standardised contracts;
 - ◆ All terms except price, volume and delivery period are fixed;
 - ◆ Can be traded via an electronic platform/bulletin board .
- *Exchange based trading*
 - ◆ Trading of standardised products;
 - ◆ The exchange is the counter party to all trades;
 - ◆ Trading is continuous (unlike electricity).
- Generally the arrangements for trading short-term and long term products are the same;
- Most trading in the EU is done OTC; US has more exchange-based trading, but OTC still dominates.

OTC vs. Exchange trading (1)

- *Advantages* of exchange-based trading are:
 - ◆ No credit concerns - the exchange guarantees the delivery obligations, if one side defaults;
 - ◆ Trading is anonymous, which can have commercial advantages;
 - ◆ Allows traders to register once but can then trade with all counterparties.
- *Disadvantages* (perceived anyway)
 - ◆ Traders must post up collateral to guarantee their obligations
 - ◆ Reporting requirements are more burdensome
 - ◆ Exchange membership fees/cost of running the exchange

OTC vs. Exchange trading (2)

- In the EU and US regulators have tried to push more energy trading onto exchanges;
 - ◆ Idea is that the clearing house removes the systematic risk of a ‘cascading failure’;
 - ◆ This is one of the main points of the ‘Dodd-Frank’ US legislation.
- However, large energy firms who are trading to hedge their physical positions object, citing large collateral requirements
 - ◆ For example, a major EU utility claimed that Proposed EU legislation to regulate the OTC derivatives market could cost the energy sector “tens of billions” of Euros.
 - ◆ RWE estimates it could face costs of “between Eur1-4 billion (\$1.3-5.4 billion) associated with additional collateral margins and the related processing and documentation requirements”.

Contracts – duration and indexation

- *GB*
 - ◆ Some long-term (10 year) contracts, but indexed to the spot price.
 - ◆ Most trading OTC, using standardised contracts:
 - Week-ahead, month ahead, quarter, summer, winter, calendar year etc.
 - ◆ Some exchange trading, but volumes are still small.
- *Continental Europe*
 - ◆ More gas is sold on longer term (20-30 year) contracts, indexed to oil products.
 - ◆ OTC trading of standardised products has grown at key hubs
 - The Dutch and German hubs have the highest volumes and are most liquid.
- *US*
 - ◆ Even ‘long-term’ contracts are at most about one year
 - ◆ Nearly all indexed to spot prices;
 - ◆ Each month traded as a separate product;

Contents

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Typical roles and responsibilities

- The *Transmission System Operator* (TSO) is typically both the owner of the transmission network (the TO) and the system operator (the SO).
 - ◆ Responsible for balancing the system; delivering the gas;
 - ◆ Keeping track of trades and who owns how much gas;
 - ◆ Sells primary transport capacity
 - ◆ Monitoring ownership of transport rights and trades;
- *Market Operator* (MO)
 - ◆ Usually responsible for operating the exchange
- Specific roles and responsibilities vary according to specifics;
 - ◆ Germany has a market areas with multiple Transmission Owners and a single System Operator;

Requirements for the MO and the SO

- Usual for there to be restrictions on the relationship between the TSO/SO MO and traders/shippers.
 - ◆ Separating transmission role from trading/supply has been a major focus in the EU.
- *Should not be cross-ownership between the shippers and the MO/TSO.*
- “MO should have:
 - ◆ financial resources;
 - ◆ skilled and experienced personnel, and
 - ◆ systems;
- Adequate to ensure that the market is conducted in an orderly and proper manner according to clear and fair rules.”

Gas balancing markets

- EU is the most relevant example – balancing period is similar to Colombia;
- EU balancing markets are changing:

Old system

TSO performs balancing and applies penal charges



New system

Market-based system in which imbalances are resolved largely through trading

- But arrangements differ between countries:
 - ◆ No separate balancing market in the UK.
 - Balancing trades combined with commercial trades;
 - ◆ Netherlands has a separate balancing market
 - Remains to be seen how well this works.

Information provision - prices

- *It is not required to have an exchange to have access to pricing information.*
- Prices in the EU and the US are assessed and published by trade publications.
 - ◆ In the EU a sample of traders is taken by telephone.
 - ◆ In the US reporting is more formal and automated.
- Publications report results for OTC trading.
- While there are exchange prices available, many longer term products are not traded on the exchange, and liquidity is lower.

Platts UK Market Assessments, May 9, 2011

	p/th	change D-1 (p/th)	\$/MMBtu	Eur/MWh
UK NBP Market				
Within-Day	55.65 - 55.85	2.60	9.14 - 9.17	21.51 - 21.59
DA Midday	56.10 - 56.30	2.70	9.21 - 9.24	21.68 - 21.76
Day-Ahead	55.65 - 55.85	3.05	9.14 - 9.17	21.51 - 21.59
Weekend	55.70 - 55.90	3.30	9.15 - 9.18	21.53 - 21.61
Working week+1	56.40 - 56.60	3.75	9.26 - 9.29	21.80 - 21.88
Bal Month May	56.00 - 56.20	2.35	9.20 - 9.23	21.65 - 21.72
June	56.75 - 56.95	1.15	9.32 - 9.35	21.93 - 22.01
July	57.00 - 57.20	0.80	9.36 - 9.39	22.03 - 22.11
August	59.00 - 59.20	1.10	9.69 - 9.72	22.80 - 22.88
September	58.80 - 59.00	0.55	9.66 - 9.69	22.73 - 22.80
Q3 2011	58.25 - 58.45	0.80	9.56 - 9.60	22.51 - 22.59
Q4 2011	67.00 - 67.20	0.20	11.00 - 11.03	25.90 - 25.97
Q1 2012	71.00 - 71.20	0.20	11.66 - 11.69	27.44 - 27.52
Q2 2012	63.20 - 63.40	-0.10	10.38 - 10.41	24.43 - 24.51
Winter 11	69.00 - 69.20	0.20	11.33 - 11.36	26.67 - 26.75
Summer 12	63.10 - 63.30	-0.10	10.36 - 10.39	24.39 - 24.47
Winter 12	70.20 - 70.40	0.00	11.53 - 11.56	27.13 - 27.21
Summer 13	64.80 - 65.10	-0.05	10.64 - 10.69	25.05 - 25.16
Winter 13	72.80 - 73.00	0.30	11.95 - 11.99	28.14 - 28.22
Summer 14	66.50 - 66.70	-0.10	10.92 - 10.95	25.70 - 25.78
Oct 2011 1 yr	66.05 - 66.25	0.05	10.85 - 10.88	25.53 - 25.61
NBP Indices				
		p/th	Eur/MWh	Change D-1
Platts D/A NBP index		55.75	21.55	+3.05
Platts M/A NBP Index		56.85	21.97	+1.15
Index definitions are published in the Platts methodology guide available on the Platts website.				

Information provision – capacity

- EU law describes a very prescriptive set of information that TSOs must publish:
 - ◆ the maximum technical capacity for flows in both directions;
 - ◆ the total contracted and interruptible capacity;
 - ◆ the available capacity;
 - ◆ available capacities for a period of at least 18 months ahead;
 - ◆ daily updates of availability of short-term services (day-ahead and week-ahead);
 - ◆ historical maximum and minimum monthly capacity utilisation rates and annual average flows;
- Similar requirements in the US.

Contents

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Liquidity

- *Liquidity is the 'holy grail' of all markets*
 - ◆ But it seems particularly hard to achieve in gas markets.
 - ◆ Truly liquid gas markets are currently rare outside the US, GB and Canada.
- What does liquidity mean?
 - ◆ Prices at any time represent the fundamentals of supply and demand.
 - ◆ A trade by a single party will generally not 'move' the market. There are always willing buyers and willing sellers at a price close to the price of the previous executed trade.
- A common measure of liquidity is the 'churn ratio'
 - ◆ The number of times a molecule of gas is traded before delivery;
 - ◆ For a market to be effectively liquid, churn rate should be 10-15.
 - ◆ Churn rate at Henry Hub in the US is around 300.

Link between capacity and commodity trading

- To execute a gas trade, the seller must have gas transport capacity rights to the point of sale, and the buyer must have gas transport capacity rights away from the point of sale.
- This is the key link between trading of the gas commodity and the definition and trade of gas transport capacity rights.
- The choice of capacity rights will affect the market design

- Around the world broadly speaking two systems of gas capacity rights have been defined:
 - ◆ Point-to-point capacity rights.
 - ◆ An entry-exit system

Point-to-point (P2P) capacity systems

- Used in the U.S., Colombia, in the EU during 2000s.
- *Advantages*
 - ◆ Easy for the pipeline to manage – clear where gas will flow;
- *Disadvantages*
 - ◆ Trades must take place at a defined physical location – traders must have capacity to and from that location;
 - ◆ If gas is traded at multiple locations, parties need to simultaneously buy and sell transport capacity;
 - ◆ This is of course possible, but raises transactions costs;

Entry-Exit systems

- Shippers buy entry capacity and exit capacity separately.
- This creates a Virtual Trading Point 'inside' the gas system.
 - ◆ Entry-exit is now mandatory in the EU.
- *Advantages*
 - ◆ Parties can trade gas without the need to buy or sell transport capacity;
 - ◆ This has proven to greatly increase liquidity;
- *Disadvantages*
 - ◆ Harder for the system operator to know where gas will be flowing
 - ◆ This can reduce available firm capacity
 - ◆ Transport charges can be less cost reflective, depending on the system.
- In practice many operational problems that were foreseen with EE did not materialise.

Which system is 'best'?

- Trade-off between
 - ◆ Cost reflectivity and efficient use of the pipeline system;
 - ◆ More liquid trading;
- Solution depends largely on the pipeline system and the distribution of supply and demand.
- A successful physical trading hub (which would combine with P2P capacity) needs:
 - ◆ A large volume of physical gas to flow through it, with demand downstream;
 - ◆ A liquid market in transport capacity.
- The EU recognised the risk of losing some firm capacity with EE, but thought the gain for liquidity was worth it.

What have other policy makers done to try and promote liquidity?

- Ensuring non-discriminatory *third-party access to the transport system*;
 - ◆ Entry-exit in the EU was explicitly aimed at increasing liquidity;
- *Gas release*: force the incumbent to re-sell gas to new market entrants
 - ◆ Typical way of dealing with foreclosure of the markets, where the incumbent has 'bought all of the gas';
- *Market Maker role*: a market player (not always the incumbent) simultaneously offers to buy and sell a volume of gas in the market;
 - ◆ Ensures that there is always a counter-party willing to trade;
 - ◆ If the market maker is dominant, then the regulator can fix the maximum difference between the offers to buy and sell ('bid-offer spread').
- Forced sales of Royalty Gas onto a trading platform.

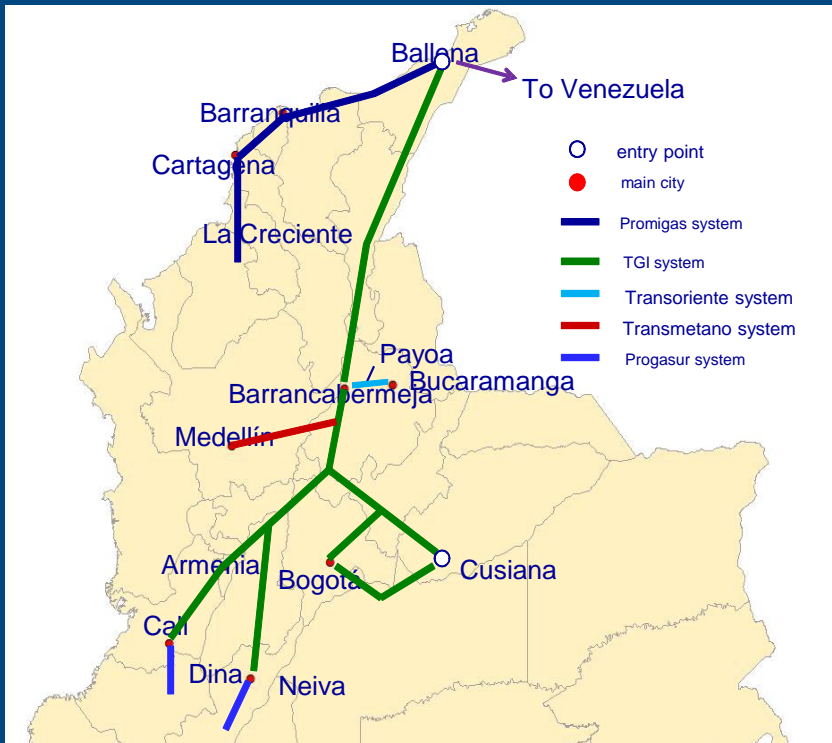
Contents

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- Commodity trading institutions and arrangements
- Roles and responsibilities
- Liquidity and capacity rights
- Issues in Colombia
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What are the current features of secondary gas trading in Colombia?

- Secondary trading largely driven by re-sale of 'conditional firm' gas by power plants;
 - ◆ Subastagas auctions are a new and interesting development;
- Lack of transparency regarding capacity and commodity trading;
- Insufficient information on prevailing gas prices;
- Trading mainly done bilaterally;
- Non-standard products delivered to multiple locations;

What are the most relevant features of Colombia that affect gas market design?



- The number of potential traders is a concern;
 - 15 buyers from Guajira;
 - 24 from Cusiana;
 - 10 from La Creciente;
- Experience suggests that we would want around 60 traders to make the market liquid.

What are the most relevant features of Colombia that affect gas market design?

- Challenge is to try and connect as many buyers and sellers as possible
- Market could dry-up during El Nino
- Market power is an issue, but not one that the a secondary market can resolve
 - ◆ This is mainly an issue for the primary gas auctions.

Contents

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Preliminary conclusions from Tasks 2&3

- Experience from the US and the EU indicates that for secondary trading to be successful, the market must be liquid.
- Challenge is to enable the largest number of buyers and sellers to interact while keeping costs proportional to the benefits.
- Lack of information is a barrier to trade.
 - ◆ Increasing the level of information available could be carried out at relatively low cost.
- In other gas markets, exchanges have typically developed after OTC trading has matured.
 - ◆ An exchange is not required to promote liquidity, and OTC prices can be reported without the need for an exchange.

Preliminary conclusions from Tasks 2&3 (cont.)

- It seems that having a combined balancing and trading market like the OCM would maximise liquidity.
- Other gas markets do not create separate trading institutions for the sale of short-term secondary trades and long-term secondary trades.
- Creating a market-maker position, and mandating the sale of specific volumes of gas 'Royalty gas' in the secondary market could help liquidity.
- The MO and TSO should be independent of shippers and traders.