Designing and Structuring the Secondary Market, Short-term Markets and their Management Mechanisms

Task 5 Report

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1. Introduction

The Comisión de Regulación de Energía y Gas (CREG) has retained *Market Analysis* and *The Brattle Group* to advise on the design of secondary markets for the trading of gas and gas transport capacity in Colombia, and their management mechanisms. Our first substantive report addressed Tasks 2 and 3 of the project, introducing the relevant analytical framework and international experience.[1] Our second report, responding to Task 4, described different options for developing secondary and short-term markets for gas and transport capacity in Colombia.

Our Task 4 report did not make specific recommendations, but rather defined objectives and criteria to assess the pros and cons of the alternatives identified. Following further consultations with the CREG and the industry, this Task 5 report describes in greater detail the markets to be introduced and their management mechanisms.

We have organized this report as follows. Section 2 provides background and summarizes the main features of the option to be implemented. Subsequent sections provide further details. Section 3 describes the contracts to be traded. Section 4 describes the roles of the Market Operator. Section 5 describes the market maker role. Section 6 discusses market power and related issues. Annex 1 contains further details on the MO's role in managing trade.

2. Background

There are currently no organized markets for secondary or short-term trading of gas or transport capacity in Colombia. Nor are there any organized methods for collecting and disseminating information on such trading activities, which occur on a private, bilateral basis. Nevertheless, a significant amount of secondary market trading does take place, mostly driven by the need for gas-fired power plants to resell gas and transport capacity purchased under firm contracts for the firm energy market. Approximately 45% of Colombia's available gas is purchased by power plants for the firm energy market and is available for resale. Some power companies sell most of their surplus gas in conditional firm contracts, while others sell only 10-15% this way, and the rest in shorter-term transactions. One distribution company told us that it purchases up to 20% of its gas supply requirements in the secondary market from the gas-fired power plants.

There is a clear demand for the creation of more organized markets or trading platforms for gas and transport from both producers and consumers in Colombia. Producers, for instance, have argued for need for more transparent information on market transactions and transport capacity availability, and for improved supply-transportation coordination. Other companies argue for organized and administered short-term and secondary markets, which exclude or limit the participation of the large producers. While there is currently no consensus on all of the details of the market reforms required, most if not all market participants in Colombia appear to believe that their trading opportunities will be improved by greater market transparency and organization of one type or another.

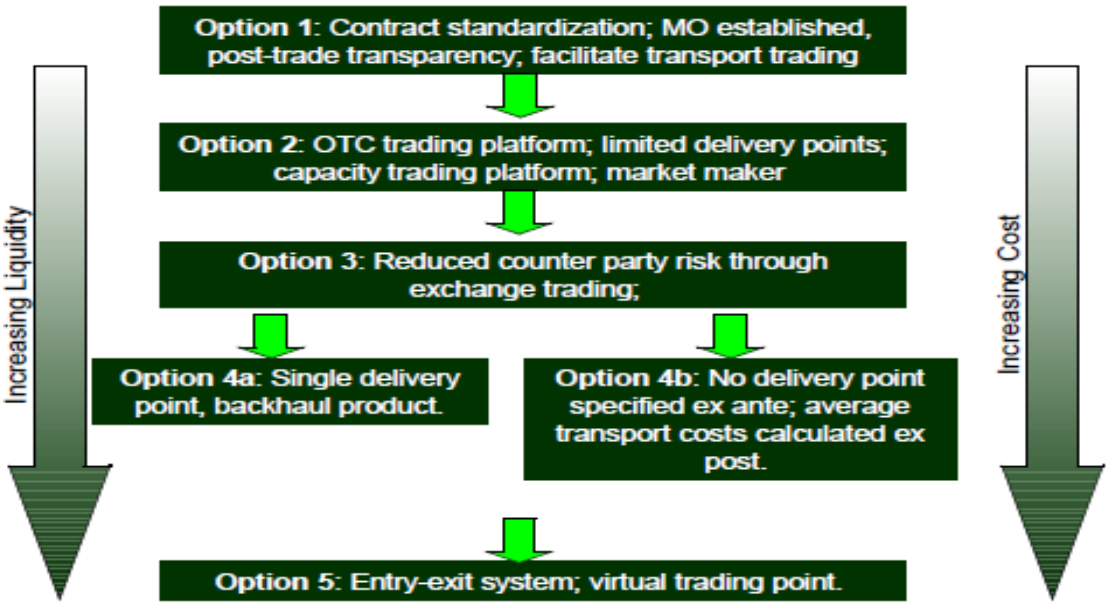
In our Task 4 report we identified a number of possible combinations of natural gas physical markets that might be developed in Colombia, presented as a number of 'nested' reform options, or policy packages, involving increasing degrees of regulatory intervention, organization and changes to the status quo. The reform options described were:

- Option 1: *Gradual Market Evolution.*
- Option 2: *OTC Trading and Development of Trading Points*
- Option 3: *A Gas Exchange*

[1] "Designing and Structuring the Secondary Market, Short-Term Markets and Their Management Mechanisms, Task 2 & 3 Report," 17 February 2011, Market Analysis (David Harbord and Marco Pagnozzi) and The Brattle Group (Paul Carpenter, Dan Harris and David Robinson).

- Option 4: *A Single Trading Point or Physical "Hub"*
- Option 5: *Entry-Exit Charges and a Virtual Trading Point*

The figure below summarizes the main options considered in order of increasing transition costs and market liquidity and competitiveness. Option 1, for instance, introduces relatively few changes to the status quo, while Option 5 requires fairly radical changes to current regulations and market organization.



Our Task 4 report did not attempt to describe these options in sufficient detail for implementation, but delineated the main alternatives and identified the key changes that would be required for their adoption.

Following our recent consultations with the CREG and the industry a consensus has emerged in favour of implementing Options 1and 2. The purpose of this report is therefore to describe in much greater detail the necessary changes and reforms to be adopted in implementing these options. We also recommend that the CREG set up an industry group to consider the desirability of implementing more comprehensive reforms, such as those described in Option 5, over a longer time horizon.

2.1 Options 1 and 2: Summary

Option 2 contains a number of elements, including all of the features of Option 1, which we briefly summarize here.

A. Standardization of contracts and delivery points

Gas supply and transport contracts in secondary and short-term markets would be standardized to make bilateral trading more practical and allow fast, low-cost bilateral trades to take place. By standardized contracts, we mean:

- the basic terms and conditions of all contracts would be identical[2]

[2] These will be determined by the results of the companion study on standardizing contracts by Auctionomics and FTI Consulting.

- a menu of standard contract durations and start dates
- the delivery points of the contracts will be partially standardized, so that all secondary gas contracts would specify delivery at one of three or four locations where most gas is already traded

Contracts for a given standard duration and start date would therefore only need to specify the counter parties, the price, the quantity and one of the standardized delivery points.

B. Establishment of a Market Operator (MO)

An MO will be established whose role is to:

1. Publish aggregate data on the volumes and prices of secondary market trades in gas, and to create trading platforms or bulletin boards, where traders can make bids and offers for the standardized gas and transport products.

2. Develop more liquid and transparent OTC trading by creating trading platforms or "bulletin boards" where:

- traders can make bids and offers for the standardized gas and transport products;
- the TSOs post information on available primary capacity and offer to sell primary transport capacity at regulated prices; and
- un-nominated gas and transport capacity be offered to the market on a daily basis by the MO, possibly by holding a simultaneous one-hour auction at the end of the nomination period ('use if or lose it' rules)

The MO might also be made responsible for managing trade at the trading points and for market monitoring.

C. Establishment of a market maker

Liquidity is to be stimulated on the OTC gas trading platform by creating a market maker and/or by mandating the sale of specific volumes of gas, e.g. 'royalty' gas, on the OTC platform. The bid-ask spread of the market maker could be capped to provide strong incentives for market maker to attempt to "bracket" the "real" market price, or determined by a competitive tendering process. The role of the market maker is to support trading in the main standardized gas contract categories.

D. Market power and related issues

Voluntary trading: An important issue is whether secondary trading on the OTC trading platforms should be voluntary or mandatory. If the OTC market is well-designed, it will be attractive to market participants, so mandatory participation may be neither necessary nor desirable. We recommend that participation in the OTC trading platform be voluntary.

Limitations on dominant producers: Market participants have expressed concern about dominant producers' participation in secondary markets. One concern is that dominant producers will offer less gas in the primary auctions in order to sell it under long-term contracts in secondary markets. Producers have legitimate reasons for trading in secondary markets, for example to replace lost production. We recommend that dominant producers be limited to trading in shorter-term products (e.g. less than three months) in secondary markets.

Transport capacity release: Numerous concerns were raised about the availability of gas transport capacity, and the potential for this to become a bottleneck for both primary and secondary market trade in gas. Short-term and longer-term "use it or lose it" rules are proposed for transport capacity to ensure that gas trading is not limited in this way.

The following sections describe each of these elements in greater detail.

3. Standardized Contracts and Location of the Trading Points

As described in Section 2 above, the gas supply or commodity contracts should be standardized to make OTC trading more practical and allow fast, low-cost bilateral trades to take place. The OTC contracts should include:

- a within-day gas product, where the gas must be delivered before the end of the gas day;
- daily, weekly and monthly products, where the gas is delivered at a constant rate over the specified gas-day, week or month;
- longer-term contracts where gas is delivered over a quarter, a calendar year, or longer periods.

The standardized products should be for Firm, Interruptible and Conditional Firm contracts as defined by the related consultancy for physical delivery of the gas, rather than contracts that are financially settled (financial contracts). Financial contracts are not practical in the early stages of the market because they require an underlying liquid physical market against which they can be valued.

We recommend that the products be specified following consultation with industry, but as a minimum a daily, weekly and monthly product should be offered initially.

Traders in secondary markets should be required to hold primary gas or transport contracts to cover their positions.

Experience in international markets suggests that short-term products tend to be more popular initially, because these products require less collateral and involve less counter party risk. For example, if party A sells gas to party B under a one year contract at a fixed price, there is ample time for prices to move significantly and the volumes of gas involved are usually large because of the time period involved. This means that while longer term products could be offered, initial trading is likely to involve short-term products.

Nevertheless, since the products are standardized, there is no real cost to introducing new products, even if they are not heavily traded. Therefore it would seem to make sense to err on the side of allowing for more products than might actually be traded in practise, because trading in these products might become more popular at a later date.

3.1 Location of the Trading Points

The delivery points of the contracts would be partially standardized, so that all secondary gas contracts would specify delivery at a limited number of locations. There should be a sufficient number of trading points to allow all market participants to trade without needing to buy and sell large volumes of transport capacity. At the same time, the number of trading points should be limited so as to concentrate trading and achieve a reasonable level of liquidity.

The final trading locations should be subject to an industry consultation. However the trading points at Ballena, Cusiana, La Creciente, and Vasconia would achieve a good balance between accessibility and liquidity. Note that, absent a physical connection, Ballena would actually be split into two hubs – “Ballena East” and “Ballena West” - one for the TGI system and another for the Promigas system. An important issue is whether it is feasible to connect the two systems so that a single delivery point is created, facilitating trade between the two networks. Connection of the two systems would appear to be highly desirable.

4. The Duties of the Market Operator

The main duties of the Market Operator (MO) are:

- to collect, verify and publish information on trading in the secondary market; and
- establish and manage the trading platforms or bulletin boards

In addition the Market Operator might be made responsible for:

- managing trade at the physical trading points; and
- market monitoring

We describe each of these these tasks below.

4.1 Collecting and Publishing Market Data

The Market Operator will publish aggregate data on the volumes and prices of secondary market trades in gas and transport. All traders will be required to report to the MO, on a daily basis, details of their secondary market transactions, including the volumes traded, the counter-parties and the agreed prices. The MO will then publish prices and volumes traded for each type of standardized contract, but not identify individual transactions.

Specifically, on a daily basis the market participants would report to the MO:

- the volume of each trade;
- the product that was traded;
- the price for the trade;
- the delivery point for the trade;
- the counter-party to the trade;

For the reports of the market participants to be a credible source of information, the MO must have a way of checking that the information reported is correct – in other words verification of the information. There must also be sanctions in place for incorrect transaction reporting.

We see two main alternatives for verification:

- the MO could have the right to audit the market participants at random. Market participants would have an obligation to retain a record of all trades for at least three years. The MO would have the right to check the trading records of each market participant and verify that the data that was reported to the MO was correct.
- market participants could send copies of all of their contracts to the MO on a daily basis. In this way the MO could verify the reported information.

The second option would be preferable, as long as the form of the contracts is electronic and the MO can manage the volume of data that would be involved relatively easily. If the form of the contracts makes the second option impractical then the first approach should be used. The MO would check if the trades reported between counter parties correspond, and query any mismatches with the parties involved.

To be useful, the reporting would have to be made and the results aggregated and published in a timely fashion. At a minimum, traders should have data on the prices for products traded on the previous day. Eventually, it would be desirable if traders also had data on prices and trades within the day.

Assuming the gas day starts at 00:00, we recommend that traders report all trades executed between 00:00 and 12:00 to the MO by 14:00 on the gas day. The trades would be reported electronically in a format that the MO can easily aggregate. The MO would then publish the first round of trading results by 15:00 on the gas day on its website. Similarly,

traders should report all trades for the gas day by 08:00 the following day. The MO would then publish this data by 09:00. This process could be heavily automated and so should require little work on the part of the MO.

Specifically the MO would publish:

- the aggregate volume traded for each product at each delivery point;
- the average price of the product.

For example, the MO could report that 100 GBTUDs of firm day-ahead gas was sold at Ballena at an average price of US$10/MBTUDs.

It has been suggested that the MO should also report additional data, such as the minimum and maximum prices for each type of transaction, and the number of individual trades. We can see no objections to the MO providing this additional information.

We also recommend a minimum reporting threshold, below which market participants would not have to report trades. This would avoid burdening small and occasional traders with reporting requirements. The MO would set the minimum threshold, based on the activity in the market and the level of trades that is regards to be too small to be significant at the time. At the beginning of the market with little activity, we imagine that all trades would be significant. But as the market and liquidity grows the MO could ignore smaller trade volumes.

4.2 Operating the OTC Trading Platforms

The MO will establish electronic trading platforms or a bulletin board where traders could make continuous bids and offers for the standardized gas and transport products. Traders would be able to see the identity of the party offering to sell or bidding to buy gas, the volumes involved, the delivery point, the duration and the price bid or offered. We refer to this bulletin board as an OTC trading platform, which would be available on the MO’s website.

To avoid bids and offers by persons that are not qualified to trade, and to ensure that the identity of the counter-party has been verified, participants would need to register with the MO for an account to access the OTC trading platforms. The process should be free and as simple as possible. We recommend that applicants simply prove that they are authorised to represent the firm, that the firm has a registered office and is registered to pay taxes etc.

Transport capacity should be sold simultaneously with gas contracts either on the same bulletin board, or on a complementary bulletin board. As above, traders would be able to see the identity of the party offering to sell or buy, the quantities offered, duration and the price bid or offered. The MO would aggregate and publish on a daily basis the prices and the volumes that have been traded in a similar manner as described above for the commodity prices.

The TSOs should post information on their available primary capacity on the MO's trading platform and offers to sell primary transport capacity at regulated prices. The TSOs should also publish on the bulletin board any planned or unplanned unavailability of transport capacity.

Gas and transport capacity that has been sold under longer-term contracts but not nominated should be offered to the market on a daily basis by the MO, possibly by holding a simultaneous one-hour auction at the end of the nomination period ('use if or lose it' rules).

Finally, the MO should be responsible for ensuring that all offers to sell commodity gas or transport capacity are backed by primary or secondary contracts.

Another model we considered for an OTC trading platform was to adopt the Subastagas auctions as a model for secondary trading, and make the OTC market a series of hourly

auctions, but with a wider variety of products than are currently traded in the Subastagas auctions. However, international experience shows that for frequent daily trading, traders seem to prefer a continuous trading process – the sentiment being that this enhances liquidity. We propose to adopt that standard model of continuous trading for the bulletin board.[3]

4.3 Managing Trade at the Trading Points

The MO could made be responsible for taking over management of the trading activity at the trading points, including capacity nominations, an activity that the TSOs currently perform. Annex 1 describes how this would work in greater detail should it be deemed desirable.

4.4 Market Monitoring

The MO might also be made responsible for monitoring trading for signs of market abuse or manipulation. The MO might report any suspicions of market abuse/manipulation to the CREG and the relevant competition authorities, who would investigate and prosecute any offences with the MO providing technical input.

This market monitor role should logically fall to the MO because it would have access to all the contract information required to perform this task.

5. Establishment of a Market Maker

Liquidity should be stimulated on the OTC trading platform by mandating a major market player, such as Ecopetrol, to act as a market maker and/or by mandating the sale of specific volumes of gas, e.g. 'royalty' gas, on the OTC platform. As described in our Tasks 2&3 report, pp. 9-10, the market maker would be obliged to offer to sell a minimum volume of gas at an advertised price every day while simultaneously bidding to buy gas at a lower price. The bid-ask spread of the market maker would be capped to provide strong incentives for market maker to attempt to "bracket" the "real" market price. The market maker could support trading in the main standardized gas contract categories.

There are precedents for regulators requiring a party to act as a market maker to address concerns over market liquidity. For example, in Denmark DONG Energy and Energi Danmark have committed to act as market makers in the electricity market, and there is a mandatory market-maker role in the electricity market of New Zealand. British Gas, the incumbent in the GB gas market, was appointed as a market maker in the earlier years of GB gas market liberalization. Ofgas, the gas sector regulator at the time, fixed the difference or spread between British Gas's buy and sell offers. Recently, Ofgem (Ofgas's successor and regulator of GB gas and electricity markets) has proposed a Mandatory Market Maker (MMM) role to stimulate liquidity in the GB electricity market. The incumbent electricity supply companies – the so-called Big 6 – would be required to offer volumes for a range of electricity products and Ofgem would approve the bid-offer spreads.[4] In discussions with market participants there has been broad support for the market maker role.

There are a number of issues which remain to decided on the market maker (MM) role:

- who should the market maker be, and how will the MM be appointed?
- how is the MM's bid-offer spread set?
- what volumes should the MM offer for each product, both at any one time and cumulatively over the day?

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[3] Note that liquidity is not a concern when auctioning a large volume of gas, since the volume of gas being sold and the advance notice of the sale should attract counter parties.

[4] For details see Ofgem, The Retail Market Review - Findings and initial proposals," Supplementary appendices, 21 March 2011, Table 2 p.30.

- should the MM receive compensation?

As indicated above, one possibility would be to require that a major market player, such as Ecopetrol, to act as the market maker with a regulated bid-ask spread.

An alternative would be to hold a tender for the role of market maker. Pre-qualified firms would submit offers to be the market maker in one of more of the standardized gas products. The offer would consist of the bid-ask spread required, with the MM role awarded to the bidder with the lowest spread.[5]

To allow for the event that there is little competition for the MM role, a maximum acceptable bid-offer spread might be set (i.e. a reserve price).

Regardless of whether the MM role was appointed or awarded by tender, the CREG or MO should specify in advance the volume of each product for which the MM should make quotations at any time, the minimum net daily volume that the MM is required to buy or sell, and the percentage of the time such quotations must be made in the market. These parameters would need to be communicated in advance of the tender procedure described above.[6]

6. Market Power and Related Issues

6.1 Requirement to Participate in the Market

An important issue is whether secondary trading using the OTC trading platform described above would be voluntary or mandatory. If trading on the OTC platform was mandatory, the Subastagas auctions, or any other bilateral selling arrangement outside of the trading platform, would no longer be permitted.

If the OTC market is well-designed, it should be attractive to market participants in its own right, so mandatory participation may be neither necessary nor desirable. It could be argued that making the OTC platform mandatory would create a trading platform monopoly that might stifle innovation and service quality improvements. Moreover, mandatory participation would make it more difficult to detect problems with the OTC platform, because people would be forced to use it regardless of how flawed it was.

One could argue that market liquidity and transparency might be increased if all trading occurred on a single platform. But international experience shows that the largest boost to liquidity is likely to come from the development of standard contracts and the standardisation of a delivery point. Whether deals are made via an OTC trading platform, or brokered bilaterally will not affect liquidity, and market participants should simply choose the platform that minimises their transaction costs. For this reason we recommend that participation in the OTC trading platform is voluntary.

6.2 Participation of Producers in Secondary Markets

A related issue is the extent to which dominant producers would be allowed to participate by trading on the OTC platform, and if so for which products. Some market participants have expressed concern about producers participating in the market. One concern is that dominant producers will offer less gas in the primary auctions in order to sell it under long-

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[5] There could be different MMs for different products, multiple MMs for the same product or one MM for all products. We recommend that initially, the market-making activity is confined to only shorter term products – for example daily and weekly contracts. This will minimise the capital requirements for the MM role, and reduce risk. The MM could be appointed for a relatively short time frame – perhaps one year – to allow the frequent re-tendering of the MM role and adjustment of bid-offer spreads.

[6] For example, in the European Energy Exchange, the MMs in the gas spot market have to quote at least 80% of the time during so-called core or peak trading periods, and 50% of the time in other periods. The MM has a maximum bid-offer spread of 0.4 €/MWh, and must offer to buy and sell a minimum of 7.2 GWh of gas.

term contracts in secondary markets. Another possible concern is that producers could exercise market power by buying gas in the secondary markets, thereby limiting supply.

Producers could have legitimate reasons for buying and selling in the secondary market, for example to replace lost production. The short-term secondary market may also be the obvious place for producers to dispose of any production not sold under longer-term contracts in the primary auctions.[7] We therefore recommend that dominant producers be limited to trading in shorter-term products in secondary markets (e.g. contracts less than a a quarter) and be restricted to only trading on the MO operated trading paltforms.

It will be preferable to address remaining market power issues via the market monitoring role of the MO discussed above.

6.3 Release of Unused Pipeline Capacity

In our consultations with the industry numerous concerns were raised about the availability of gas transport capacity, and the potential for this to become a bottleneck for both primary and secondary market trade in gas. Specifically, it was suggested that holders of long-term transport capacity contracts were sometimes unwilling to release unused capacity, thus preventing other traders from shipping gas. We propose two versions of a “use-it-or-lose-it” mechanism to deal with these issues.

6.3.1 Short-term use-it-or-lose-it mechanism

Transport capacity that has been sold under longer-term contracts but not nominated should be offered to the market on a daily basis by the MO, possibly by holding a one-hour “auction” at the end of the daily nomination period.[8] An open question is whether the MO should set reserve prices for the transport capacity offered, and whether or not these should depend upon the combination of capacity versus commodity charges in the primary transport contracts. Whatever price the MO does receive for the capacity sold should be passed on to the primary contract holder, possibly minus a reasonable charge for administration etc. and net of commodity charges.

An alternative mechanism would be for TSOs to issue interruptible contracts to shippers and to allocate un-nominated capacity under the interruptible contracts on a daily basis. Shippers holding interruptible contracts would then pay only a commodity charge for their pipeline usage.

Since gas purchased under longer-term contracts but not nominated also becomes available on a daily basis, there is a strong argument for this being offered simultaneously by the MO using the same type of auction mechanism. In this way traders could purchase both gas and unused transport capacity at the end of each day's nomination period.

Of course, holders of longer-term gas and transport contracts should have strong incentives to offer their spare capacity to the market themselves, as day-ahead or longer-term products in the secondary markets. Hence the MO's role in selling this capacity on behalf of market participants should be limited.

6.3.2 Longer-term use-it-or-lose-it mechanism

Similar issues arise with respect to the primary auctions for longer-term gas contracts. Numerous industry participants have suggested that the auctions will be affected by the fact that most, if not all, transport capacity is held under long-term contracts with the TSOs.

Again, holders of transport capacity contracts who do not succeed in purchasing gas contracts in the primary auctions could be expected to offer it in the secondary market. To

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[7] But see Section 6.3 below.

[8] An exception to this rule might be applied to gas-fired power plants which require greater flexibility due to re-despatch in the electricity market.

ensure that this takes place, however, we propose a rule requiring the capacity to made available. For example, a shipper with a long-term contract on the Ballena – Barrancabermeja pipeline for 50 GBTUDs but which purchases only 25 GBTUDs of longer-term gas contracts from the Guajira fields would be required to offer the additional 25 GBTUDs to the market.

The precise mechanism for doing so has yet to be determined in detail, e.g. whether the capacity should be offered in an auction organized by the MO, or at regulated prices.

Annex 1. Managing Trade at the Trading Points

We explain the role of the MO by way of an example that illustrates the interactions between the MO and other market actors, including the pipelines. We take the case that:

- There is an onshore receiving terminal at Ballena (the terminal)
- The offshore production must be directed to either the west side of the terminal (Ballena West or BW) or Ballena east (BE). There is no onshore connection to allow the terminal operator to transfer gas from BE to BW or vice versa;
- The pipelines start at a flange somewhere downstream of the terminal;
- The terminal operator is a different entity from the pipeline operators;
- In this examples we discuss trading at Ballena, where the delivery point for all gas trades is at the terminal just upstream of the pipelines – so the terminal is acting as a physical hub. Other delivery points would only be on one of the pipelines and so could be simpler to operate [or may even be operated by the pipelines – need to decide];
- Trading takes place day ahead, and at the end of trading nominations are made for the following gas day.
- The actors in the market are:
    - Gas producers (in this example Ecopetrol), who produce gas and deliver it to the terminal;
    - Traders who buy and sell gas and transport capacity. We refer to these traders as party A, B, C, etc.;
    - The pipeline operators, who are responsible for delivering the nominated gas flows;
    - The MO who is responsible for co-coordinating trading and balancing at the delivery point or hub.

Suppose that Ecopetrol has a (long-term) contract with party A for 100 units/day for delivery at the BE terminal (the terminal). Party A sells (day-ahead) 50 units to party B, who re-sells to C etc. At the end of the trading day the gas passes to party Z. Z has the rights for the gas for the following day, which is the delivery day. In this example 100 units of gas arrive at the terminal and 100 units leave

- Party A nominates to the gas producer (Ecopetrol in this example) that it wants 100 units delivered at BE.
- Party A nominates to the pipeline that it wants to transport 50 units of gas (the remainder of the Ecopetrol gas which party A did not sell). We call a request to the pipeline to transport gas a ‘flow nomination’.
- Party Z wants to transport its 50 units away from BE, and tells the pipeline it wants to transport 50 units away from BE the following day.

Parties making trades would also notify the MO that they have bought or sold a volume of gas, and the pipelines also report all flow nominations to the MO. The MO would then track all the parties’ net trading positions, and in the example above it would see that A has a right to transport 50 units away from the terminal, Z has a right to transport 50 units, and the obligations of all parties B to Y have been extinguished because their trades have netted out. So in this example:

- Ecopetrol would tell the MO that it will deliver 100 units to party A the next day, and A informs that MO that it has bought the 100 units from Ecopetrol.
- Each party B to Z is responsible for informing the MO of the volumes of gas that they have bought and sold for the next day and from which parties. The MO checks that buying and selling notifications match, and resolves any errors/differences.

The MO is also responsible for checking or policing that flow nominations are consistent with the party's position. In the example above, if party A tried to nominate 60 units for transport away from the terminal the MO would see that A has not bought the corresponding amount of gas and would be out of balance at the hub – that is, A would be trying to transport away more gas than it has a right to. The MO would ask A to correct its flow nomination, or to buy more gas (assuming there was time to do so).

Moreover:

- The pipeline is responsible for checking that flow nominations match capacity rights held by the nominating party. If nominated capacity exceeds the capacity rights held the nominating party is notified and asked to re-nominate;
- The pipelines then inform the MO of all flow nominations which are consistent with capacity rights held;
- The MO checks that pipeline nominations are consistent with the party's rights and obligations to deliver gas to or take gas from the hub.
- Each party is responsible for delivering to the hub or transporting away from the hub any net volumes of gas that they have agreed to buy or sell.

For example, suppose that party Z had bought 50 units of gas at BE, but only had capacity rights for 40 units of gas. If Z was unable to buy any more transport capacity, or sell its excess gas, the MO would only allow Z to transport 40 units away from the hub, and the MO declares Z to be long 10 units.

The MO would instruct Ecopetrol to reduce production by 10 units relative to the volume nominated by party A. The MO would then sell the 10 units of long gas to Ecopetrol at an administered price, thereby bringing the terminal trading back into balance.

It is worth highlighting that under these schemes:

- Parties must be balanced at each side of the terminal (BW and BE), which is to say that the sum of deliveries to each hub plus net gas bought at that hub less gas nominated to be transported from that hub must equal zero.
- Imbalances would also be calculated for each individual pipeline. In other words, the pipeline operator would ensure that for each party, flows in equalled flows out over the balancing period.