

Balancing tools –product definition and deployment

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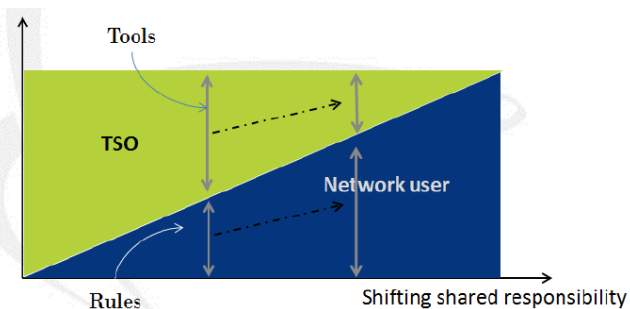
1 Introduction

1.1 Why does the TSO need to balance the system?

The Framework Guidelines on Balancing provide overall guidelines on how balancing responsibilities have to be shared between network users and the TSO:

- Network users take primary responsibility to balance their portfolios by matching their inputs and offtakes from each balancing zone during the relevant balancing period
- The role of the TSO in gas balancing is thereby minimized, and will only consist of residual balancing:
 - Manage end-of-day line-pack level to be close to target
 - Balancing actions resulting from differences between aggregate inputs and off-takes by network users over the day
 - Managing within-day positions of the network
 - keep the system line-pack within accepted operation envelop
 - Keep line pack of sub-systems and pressures within accepted operational envelope and/or within contractually agreed limits

As represented in the picture below, the more the responsibility is shifted from the TSO to the network user, network users need to have incentives on their balancing behaviour the less the TSO needs balancing tools to solve residual balancing issues.



In an entry/exit system with a daily balancing regime, any complexities related with locational issues¹ and with temporal issues² that arise from the operation of the regime have to be managed by the TSO in its residual and system balancing roles. To manage these issues, the TSO needs balancing tools.

As seen elsewhere in the NC development process, within-day obligations may be necessary to deliver an efficiently functioning regime and to limit the TSO's need to access to balancing tools for temporal balancing issues.

In an entry/exit system in principle there are no locational requirements on network users. However there may be scenarios in which gas flows are such that pressures will either exceed maximum levels or drop below minimum levels. The TSO needs tools to manage these scenarios.

1.2 How does the TSO perform its role of residual balancer

The dynamic nature of flow rates onto and off the system will manifest themselves as changes in linepack levels (here the amount of gas in the system) and pressures at different locations in the system. The TSO will seek to manage linepack within an acceptable operational envelope³. In this context the role of the TSO is to either remove excess gas from the system or get additional gas onto the system. In a market based balancing regime the TSO should do this through market based mechanisms. Where possible the balancing regime should give price signals that incentivise network users to help balance the system; where necessary the TSO can trade gas on a more physical basis. Only where the market can't or doesn't respond in a way to keep the system within the operational envelope should the TSO take a balancing actions using balancing services it has procured as a back-up for these situations.

¹ possible physical limitation to move gas from one part of the system to another or possible linepack depletion within a particular area of the system

² possible linepack depletion of the system at particular periods within a day

³ This may also relate to the distribution of gas throughout the system which may to an extent be influenced by the TSO's limited scope to move gas around the system including the use of compressors and valves.

2 Two types of balancing tools: Short Term Standardized Products and Long Term Balancing Services

TSOs will need balancing tools to keep the system within accepted operational envelope.

Balancing Tools shall be defined by ENTSOG as: *“means by which the TSO can ensure flexible gas is input into or offtaken from the system (or part of it) in order for the system to remain within safe operational limits. These balancing tools may require flexible gas to be input or offtaken*

- *during the whole balancing period or during a specific time window within the balancing period*
- *In the whole system or in a specific part of the system*

These balancing tools can be provided for use by TSO s via short term arrangement or through long term arrangement. The Framework Guidelines provides the following definitions related to balancing tools:

- *“Flexible gas – gas required to meet short term fluctuations in demand by customers. It also contributes to overall system security by responding to unexpected system requirements”*
- *“Short term flexible gas products - flexible gas products traded intraday, day-ahead, two days-ahead of gas delivery or for two days over a weekend (or three days in the event of a national holiday attached to a weekend)”*
- *“Long term flexible gas products – flexible gas products traded for delivery over more than two days (or three days in the event of a national holiday attached to a weekend) and up to one year, i.e. including weekly monthly quarterly and annual durations”*
- *“Balancing services –additional services (i.e. additional to the buying and selling of flexible gas) that a TSO may buy in order for the system to remain within safe operational limits, for example the ability to inject/withdraw gas into/ from storage”.*

Two hypotheses are introduced at this stage:

- ***Any short term gas procurement of flexible gas for balancing purpose shall be made on the basis of standardized products*** (on wholesale markets or on balancing platforms as an interim step).
- ***Any long term arrangement TSO’s make for balancing purpose will be considered as balancing services*** (as defined in the Framework Guidelines). Indeed, for balancing purpose, TSOs have no need to buy or sell gas on long term basis. Therefore, any long term

arrangement TSOs can make for balancing (examples are given later but include: options to inject gas at a point in the network, capacity reserved at a storage site, etc.) fall under the definition of *Balancing Service* of the Framework Guidelines

In short, the two types of balancing tools can be characterized as follows:

Short Term Standardized products	Long Term Balancing Services
<ul style="list-style-type: none">• Buy/Sell commodity on a market• Short Term• One-time usage	<ul style="list-style-type: none">• Option/capacity to inject/withdrawal gas• Long Term• Recurrent Usage

3 Short Term Standardized products

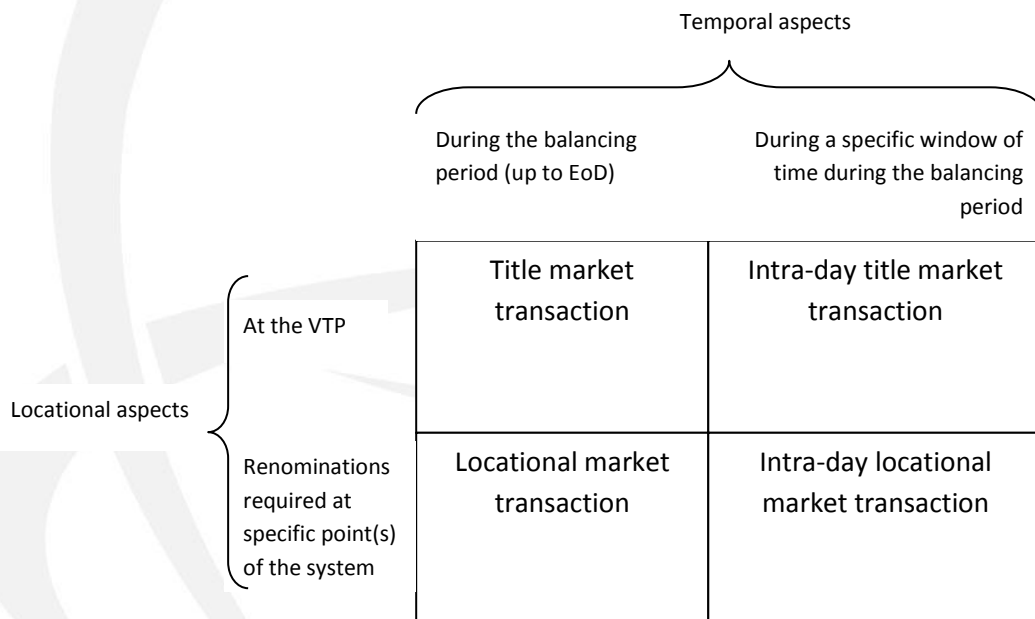
3.1 Definition of short term balancing tools

Short Term Standardized Products are commodity products by which TSO buys or sells an amount of gas on a market.

Four basic types of Standardised Short Term products are considered for TSO balancing purposes. Flexible gas can be traded

- with or without requirement to make a (re)nomination at a physical entry or exit point
- with or without specifying a within-day window

These four basic types are illustrated in the diagram below:



These products are defined below

- **Title market transaction:** gas to be transferred from the beginning of the day, if the trade was made before the day, or from a time after the confirmation of the trade, if the trade is made during the day, bought or sold through title transfer at the virtual trading point.
- **Intra-day title market transaction:** gas to be transferred during a specific window during the day) through title transfer at the virtual trading point.

- **Locational market transaction:** Title market transaction with an accompanying obligation on the originating network user to make a (re)nomination at a specified entry or exit point of the network matching the VTP trade.
- **Intra-day locational market transaction:** locational market transaction in which the (re)nomination on the specified entry/exit point has to be made for a specific window within the day.

In addition to these four products a fifth one could be added: a profile products at specific entry or exit points, defined as a **time swap**, where the amount of gas to flow by the end of the day is unchanged (no gas is bought or sold) but gas is input or off taken in accordance with the agreed profile. Such a product can be considered as a combination of two intra-day physical trades, with equal and opposite amounts.

3.2 Using standardized products

To allow the TSO to have effective access to flexible gas through trading in the short term market it is necessary to have an electronic trading platform where the TSO can trade in these standardized short term products. Where more than one electronic trading system exist the TSO will transact on the platform where its requirements are best met.

For the intra-day and locational product the party that puts the bid/offer on the screen will have to indicate the delivery window and/or the entry/exit point at which the (re)nomination will be made. This initiating party will then also be the network user that commits to making the (re)nomination at the point indicated once the bid/offer has been accepted by a counter-party.

In an entry/exit system, in which there are no locational requirements on network users, it is not likely that two network users will trade based on locational transactions; the TSO will be the counterparty in these transactions, even though two network users will not be prohibited to enter into a locational transaction.

4 Long Term Balancing Services

“Balancing Services” is defined in the Framework Guidelines as *“additional services (i.e. additional to the buying and selling of flexible gas) that a TSO may buy in order for the system to remain within safe operational limits, for example the ability to inject/withdraw gas into/ from storage”*.

Since it is unlikely that the TSO can pre-determine a specific high probability of the system being long or short at some future period buying and selling long term flexible gas has no sense for balancing purpose, all types of Long Term arrangements that TSO may need to have for balancing purposes fall under the category of Balancing Services.

4.1 Description of long term balancing services

Two types of Balancing Services will be distinguished

- **Standard Balancing Services** which are characterised by standard contractual conditions (e.g. quantity of gas, lead time for gas delivery, duration of applicability of contract, injection and withdrawal capacity of gas into the system, etc.). Examples include:
 - Long term option to buy/sell flexible gas
 - at a predefined price
 - for day-ahead, end-of day or within-day
 - at the virtual trading point or at a specific entry or exit point
 - for a limited or unlimited number of times during the option period
 - Standard capacity bundles for accessing storages
- **Non Standard Balancing Services** which are tailor-made, based on the specific needs of the TSO. Examples include:
 - Option to receive a specific within-day gas profile at a specific entry or exit point for a critical duration (e.g. when there is a maintenance planned on a neighbouring installation)
 - Tailor made parking-and-loaning type services, at a specific point in the network

4.2 Use of long term balancing services

Criteria for using Balancing Services instead of Standardised Short Term Products might include:

- Lack of liquidity in the market
- Frequency of balancing actions
- Response time needed

Lack of liquidity of the market, which could lead to operational inefficiencies and system security issues if Standardised Short Term Products are not available when needed. These inefficiencies may generate higher balancing costs or a threat to system integrity if no flexible gas provider is able to provide the required gas product on the market. The market we are referring to (which needs to be sufficiently deep to be able to balance the system) may be the end-of day or intra-day wholesale title market if the flexible gas is not required at a specific location and is not required at a specific window of time during the day. However if the gas is required at a specific location or during a specific time window during the day, it is the locational market that needs to be sufficiently deep.

Frequency of balancing actions: in case the system requires balancing actions on a frequent basis (e.g. inject gas every day in the morning and withdrawal gas every day in the evening), the cost of repeated buy/sell actions may make it more economic and efficient to turn towards Balancing Services instead of trading flexible gas through Standardised Short Term Products.

Response time needed: if the TSO faces some issues which require a quicker response than could be provided from standardised products within an adequate timescale, then Balancing Services shall be used instead of Standardised Short Term Products.

5 Merit Order

5.1 Elements in the merit order

As mentioned earlier, the network code will require TSOs to maximise the amount of their gas balancing needs to be fulfilled through the buying and selling of short-term standardised products. Maximizing this amount will require increasing faith in markets to deliver adequate availability. The TSO can foster this faith by actively trading in the markets. To avoid a chicken-and-egg situation the TSO should trade and initially have one or more balancing services as a back-up when the market does not provide the response the TSO is looking for. As confidence grows the size of the options held by the TSO in long term balancing services can decrease, ideally to a level necessary to avert problems (very) close to emergency. A merit order could be used to define the preferred sequence in which the various Balancing Tools would be considered for deployment.

To resolve an expected excursion outside of an acceptable operational envelope:

- The TSO should first seek to use one of the Short Term Standardised Products; within this category the TSO will first consider using title market transaction and only when necessary resolve to the use of intra-day and/or locational transactions.
- When the Short Term Standardised Products can't/don't provide an adequate response to the system imbalances (according to the criteria described above), TSO's shall use Standardised Balancing Services
- When the balancing needs are so specific that Standardised Short Term Products or Standardised Balancing Services cannot provide an adequate response to the needs, TSO shall use Non-Standardised Balancing Services.

This gives a merit order that will look like:

1. Short term standardised services
 - a. Title market transactions
 - b. Intra-day market transactions
 - c. Locational market transactions
 - d. Intra-day locational transactions
2. Long term standardized balancing services
3. Long term non-standardized balancing services