GAS BALANCING LAUNCH DOCUMENTATION

Contents

1 Introduction

Regulation (EC) No 715/2009 defines several tasks for the European Network of Transmission System Operators for Gas (ENTSOG). Amongst these is the development of European-wide harmonised network codes to be applied by all Transmission System Operators (TSOs) for Gas.

On the 4th of November 2011, the European Commission (EC) formally invited ENTSOG to submit a network code which is in line with the framework guidelines on gas balancing[1] to the Agency for the Cooperation of Energy Regulators (ACER) by the 5th of November 2012. ENTSOG has formally consulted with stakeholders on its project plan[2] for preparing this network code, including extensive dialogue and consultation with industry stakeholders. The conclusions to this project plan consultation can be found in a separate document accompanying this one.

A key step in the plan is the release of this launch document which is intended to provide a foundation for discussions and the development activity that will be held during the subsequent interactive network code development process and it therefore contains several concepts for further consideration with stakeholders. There will be a number of Stakeholder Joint Working Sessions (SJWSs) during the network code development process, which are working sessions dedicated to the discussion of specific topics relevant to the draft code. Later sessions will focus on the interactions so that a robust understanding of all stakeholders can inform the finalisation of the code. The results of such debates will feed into the drafting of the network code, which ENTSOG will be carrying out in parallel with the SJWS.

2 Scope

The scope of the Launch Document is guided by ACERs framework guidelines on gas balancing. The network code on gas balancing will apply to balancing regimes within EU borders. This document has been divided into two sections, the 'Balancing Target Model' (BTM) and 'Transitional Steps', which deals with the interim measures that can be used during the transition to the balancing target model.

The framework guidelines set out the timelines that the implementation of the network codes are subject to, including the concept of a roadmap for interim measures, following the adoption of the network code.

This document is not intended to provide an examination of each issue within the framework guidelines, rather focus on the key issues for addressing in the network code development process.

[1] http://www.acer.europa.eu/portal/page/portal/ACER_HOME/Public_Docs/Acts%20of%20the%20Agency/Framework%20Guideline/Framework%20Guidelines%20on%20Gas%20Balancing%20in%20Tr/FG%20Gas%20Balancing_final_public.pdf

[2] http://www.gie.eu.com/adminmod/show.asp?wat=BAL092-11 Project plan nc development for consultation.pdf

3 Requirements from Regulation 715/2009

Article 21 of Regulation 715 sets out the principles for balancing rules and states they should be designed in a manner that is:

- Fair;
- Non-discriminatory;
- Transparent;
- Based on objective criteria;
- Market based.

ENTSOG will develop the Network Code in accordance with these principles.

4 Gas transmission and balancing; an overview

Gas in a pipeline flows as a result of pressure differentials along the pipeline, the flow rate at any point being a function of the pressure gradient at that point. In a transmission network gas flows from entry points to exit points by virtue of the pressure at key locations in the network. Facilities and equipment, both in the transmission network and at end-consumer sites, operate within specific pressure ranges; entry and exit points have minimum and maximum operating pressures and other facilities within the network also need to be operated within specific operational pressure ranges. The integrity of the transmission system and of the facilities at the end-consumer can be impacted by fluctuations in pressure. Generally, pressures are determined by the volume of gas exiting the gas transmission system and the volume of gas being put into the transmission system. The band within which pressures have to be kept allows for some difference between total entry flows and total exit flows and provides the transmission system with a capability to store an amount of gas in the pipelines, often referred to as linepack. The amount of linepack available in each system differs significantly and, over time, can vary significantly within any one system, depending on demand, supply, and operating conditions in the system.

The responsibility for balancing the transmission system (i.e. ensuring that entry, exit and internal flows are managed within an acceptable operational envelope) is to be shared between network users and the TSO. The framework guidelines advocate that the most efficient outcome will be achieved, where the primary responsibility for balancing is with the network users and the TSO is responsible for any residual balancing required to keep the transmission system within an acceptable operational envelope. Where there are multiple network users inputting and off-taking gas from the transmission system at different entry and exit points, balancing becomes very complex. The balancing and emergency regimes in the different systems have been developed to keep their system within its acceptable physical operational parameters and accommodate the needs of its network users. These needs can vary depending on specific circumstances, for example the needs of an interconnector network user will differ from a network user on other systems who have directly connected customers.

Within-day balancing

Flows into and out of any system vary over the day; many end-consumers have a diurnal profile in their off-take, flexible gas is exchanged between neighbouring markets and storage facilities can change flows to the system based on demand from its customers. The physical characteristics of and the service provided by some systems result in particular challenges to keep the system within acceptable operational limits within-day. In a liberalised market with focus on integration across borders, flows may become less predictable as they will respond to market signals, therewith decreasing predictability of gas flows and increasing complexity of balancing. Furthermore an

increasing share of gas needs will be, in the near future, less predictable because of intermittent production of electricity (wind, solar), assuming it is supported by gas fuelled power plants. All this requires the monitoring of gas flows and pressures in the system throughout the gas day and when needed, appropriate balancing actions (whether they be taken by network users or TSOs) are taken to ensure that the system remains within an acceptable operational envelope, while network users requirements are satisfied. The challenge is to ensure that network users are able perform their balancing function so as the TSOs have only a residual role.

Some examples of the issues that may be experienced are:

- The cumulative imbalance within-day approaches the limit of the acceptable envelope.
- The cumulative imbalance of a sub-system approaches the limit of the capabilities of that sub-system.
- The amount of gas entering the system is sufficient, but the gas cannot be delivered at a specific exit point because of constraints within the system.
- The quality of the entry gas does not match the quality requirements of the exit gas, for example a network user entering Hi-cal gas, supplying the low-cal market.

These circumstances must be managed to maintain supplies to consumers.

The framework guidelines indicate that where balancing actions need to be taken during the day in order to ensure system integrity, the network code shall provide for the TSO to impose specific obligations relating to network users inputs and off takes during the gas day ("Within-day obligations"). By incentivising or requiring network users to take appropriate actions during the day it is anticipated that this will minimise the need for the TSO to take balancing actions.

The shared responsibility also leads to two kinds of balancing activities:

- Portfolio Balancing: The actions undertaken by network users in order to ensure that their off-takes from a system match their inputs onto the same system over the balancing period.
- TSO Balancing: the actions undertaken by the TSO to ensure that the system stays within its acceptable physical operational limits. These actions can be as a result of differences between the aggregate inputs and off-takes of network users or may involve locational or temporal actions to resolve specific system constraints.

In order to balance their portfolios, network users need access to adequate relevant information, liquid wholesale markets and/or flexible source of gas. Most systems incentivise network users to balance their portfolios by applying charges related to imbalances in the gas transmission system ('imbalance charges'). A network user's exposure to imbalance charges varies depending on the systems' balancing rules. In some systems, network users have tolerances, which allow their inputs and outputs to vary up to a certain range and therefore reduce their overall imbalance exposure. In some other systems certain network users are expected to balance their portfolio against a pre-determined standard-load-profile for non-daily metered customers, which means that intraday changes in demand are balanced by TSOs. Whereas in other systems network users must react to any intraday changes in demand by the end of the balancing period.

However, regardless of the extent to which or how network users must balance their portfolios, network users can only do this effectively and thereby reduce their exposure to imbalance charges, if they have timely and sufficient information so that they know or can estimate their current expected imbalance and have access to flexible sources of gas such as direct access to storage and LNG capacity or other sources of flexible gas, e.g. from a traded market. Information provision is part of the scope of this project (Network code on balancing).

5 Balancing Concepts

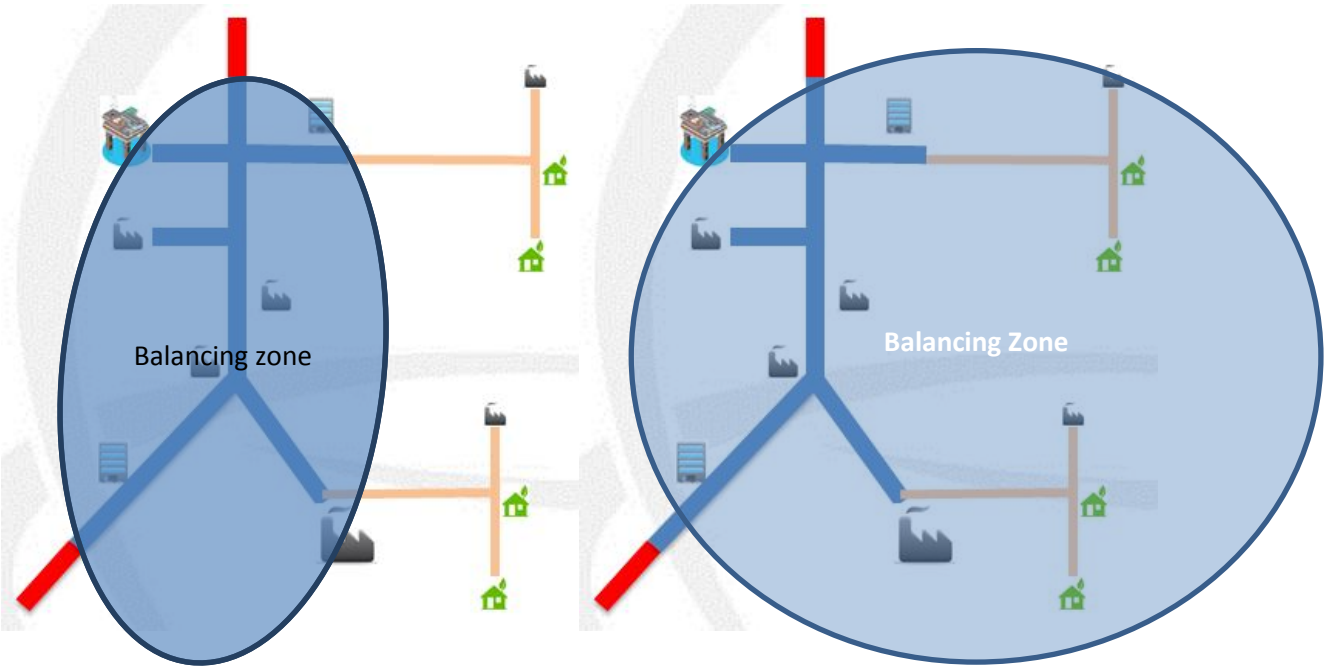
Balancing Zone

A Balancing Zone is an entry-exit system, which may consist of more than one system, as defined in Article 2(13) of the Gas Directive, to which a specific balancing regime is applicable. Distribution systems may be part of the balancing zone. The entries from storage and LNG into the transmission system as well as the exits from the transmission system into storage are part of the balancing zone.

Furthermore a Balancing Zone can be identified as the system or numbers of systems which is balanced by the combined actions of network users and the TSO over the Balancing Period, where the mismatch between the quantities of gas delivered to and offtaken from the system are maintained within acceptable limits.

The framework guidelines on gas balancing are established for gas transmission systems. They are not intended to harmonise the rules for the distribution systems.

However not all systems have a balancing zone which covers solely the transmission system and some will include one or more distribution systems. The Network Code developed by ENTSOG is based on a balancing zone which can be solely a transmission system or include distribution systems, as illustrated below.



The pipes in blue are intended to illustrate a 'transmission system' and the light yellow pipes are intended to illustrate a distribution system. The blue box shows that a 'Balancing Zone can encompass solely the transmission system or include a distribution system.

Balancing Period

The "Balancing Period" advocated in the framework guidelines is a standardised daily interval, at the end of which network users are financially settled for any deviations, as accumulated over the course of the preceding 24 hours, between their inputs into and off-takes from the balancing zone.

At the end of each Balancing Period network users are subject to imbalances charges based on the deviations between network user's inputs and outputs; the difference being the network user's imbalance. In order to provide incentives to network users to balance, each network user's imbalance quantity is financially settled at the imbalance price to determine the network users imbalance charge. After each balancing period, each network user's portfolio position will be reset to zero.

The Balancing Period is the standardised daily time interval equivalent to the Gas-day (24 hour period), defined in the CAM Network Code[3] as "the period from 5:00 to 5:00 UTC for winter time and from 4:00 to 4:00 UTC when daylight saving is applied"[4].

Virtual Trading Point

The "Virtual Trading Point" (VTP) is a notional accounting point, i.e. it does not physically exist, but through which participants in the gas market register trades. The trades are effectively a title transfer from one gas balancing account to another account.

VTP trades are not directly associated with any physical flows of gas on the system. There is no concept of physical delivery at the VTP; the trade solely defines a title transfer. The consequences of the trade will take effect via the imbalance and settlement processes within the relevant balancing regime. A completed trade defines a gas quantity transfer between the trading parties for a specific time period. The seller is debited the traded quantity from his gas account. The purchaser is credited the traded quantity of gas to his gas account.

Additionally there is no capacity booking or charging concepts associated with the VTP as there is with other Entry and Exit points at the periphery of the balancing zone. However, there may be a transaction fee associated with the VTP trade itself.

Whilst trades at the virtual trading point are title based – i.e. have no direct relationship with physical flows- the commercial framework implies that individual system users trading at the VTP may not be completely decoupled from physical entry and exit flows. Thus, for example, an upstream system user might bring gas onto the system and then sell the same quantity at the VTP thereby having no imbalance exposure. Similarly downstream system users might procure gas at the VTP and where this matches their exit flows they will have no imbalance exposure.

[3]The CAM Network Code has not yet been finalised.
[4]In practice this means a Gas Day of 06:00 to 06 :00 in Central Europe and 05:00 to 05:00 in UK and Ireland. There will be one 23 hour Gas Day and one 25 hour Gas Day each year.

For trading at a virtual trading point gas is changing ownership and not location, although there may be a lead time to support the trade matching process.

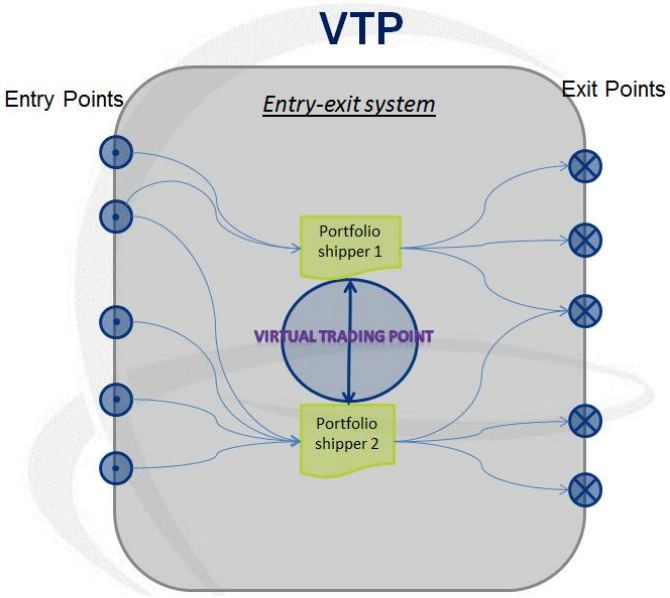
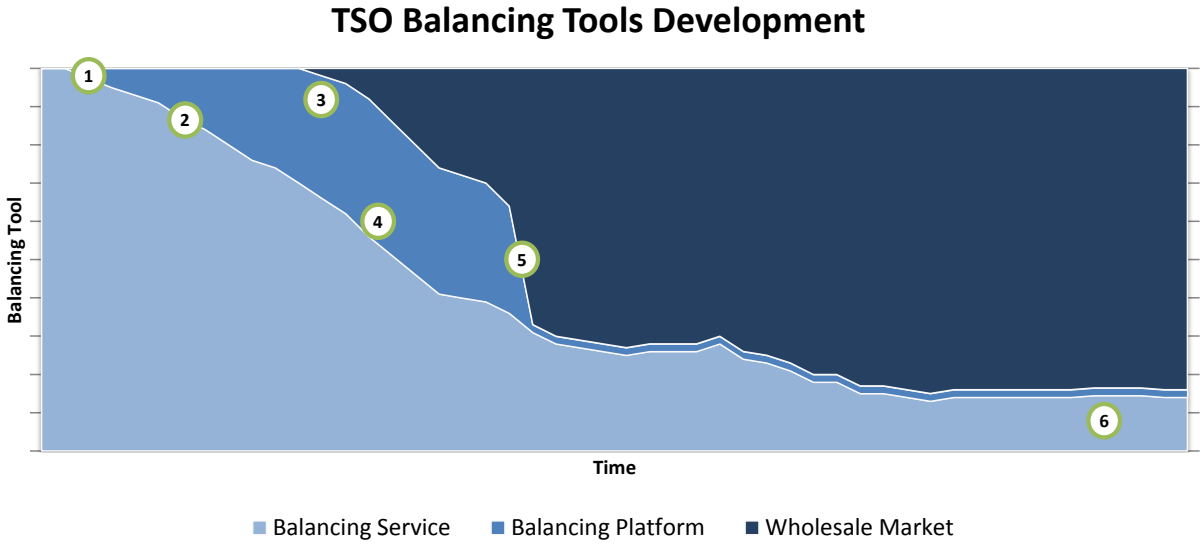


Illustration of a Balancing Evolution

The graphic below is intended to demonstrate how the TSO's balancing tools might evolve over time, from longer term balancing services to a short term traded market, i.e. the balancing target model. The diagram is illustrative only and the circumstances and scope for progression in each balancing zone will differ depending on many different factors. It should be noted that there are many other factors that will determine the development of market liquidity other than gas balancing, since liquidity might be considered in a longer time period than those transactions associated with network user and TSO short term balancing.



This table illustrates one possible transition path that might be used for a system that commences depending completely on balancing services.

Note	Discussion
1	There is not a wholesale market for the TSO to purchase short term balancing products, thus all its balancing actions are carried out via balancing service(s). The TSO creates a balancing platform in order to stimulate a short term market. All trades on the balancing platform are with the TSO.
2	The TSO starts to carry out some balancing actions via the balancing platform, but while liquidity remains low, needs to use balancing services for the majority of its balancing actions.
3	A wholesale market commences where parties can trade directly with one another (i.e. the TSO is not a party to the trade).
4	If liquidity increases on the balancing platform then the TSO carries out a greater amount of balancing actions on the balancing platform as it gains confidence in its liquidity, efficiency and reliability. As a consequence it reduces the balancing actions it requires via balancing services.
5	If market liquidity on the wholesale market has reached a sufficient level that the source is reliable for the TSO to carry out the majority of its balancing actions via the market, then it commences trading on the wholesale market. The balancing platform may be maintained for a probationary period or if the TSO requires it to source temporal or locational products. The level of balancing services the TSO holds is reduced.
6	The TSO now carries out most of its balancing actions on the wholesale market. The balancing platform may be still in use for temporal or location products, if they are not available on the wholesale market. Balancing services are maintained for meeting the balancing needs of the transmission system.

6 Role of network users and TSO

Introduction to concept

The network code shall define a European gas balancing regime which is market based. Currently in a number of systems, TSOs take most of the network balancing actions and limited trading is undertaken on the wholesale markets (where they exist). In order to achieve the requirements of the network code, the roles and responsibilities need to be shared differently between TSOs and network users.

This concept can be summed up in the following way

- Network users take primary responsibility to balance their portfolios by matching their inputs and offtakes from each balancing zone during the relevant balancing period.
- A traded market, based upon a virtual trading point within an exit/entry systems is established, that can be used by both network users and TSOs to trade.
- The role of the TSO in gas balancing is minimised, by providing incentives that encourage network users to balance their inputs and off-takes.

The framework guidelines

Balancing rules shall be market based. For this the network code on gas balancing shall set out that network users, through their portfolio balancing activities, shall take primary responsibility for matching their inputs into a system against off-takes from the system during the relevant balancing period. The principle is to provide, as much as possible, for network users to balance their individual portfolios, which is likely to minimise the need for TSOs' balancing actions.

The network code on gas balancing shall require that TSOs, during its implementation, shall not impose barriers to the development of liquid short term wholesale markets. However, to ensure that the system is kept within acceptable operational limits, the TSOs need to be able to buy balancing services in a market based manner. As such, TSOs should use the wholesale market to procure gas in a transparent manner, as far as possible on an equal footing with network users and by maximising the amount of their balancing needs to be fulfilled through the buying and selling of short term products.

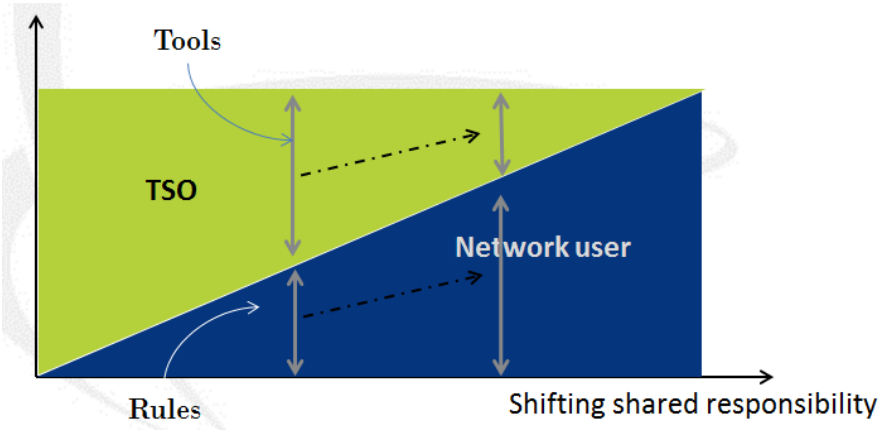
A feature of market based balancing rules is that where the TSO needs to take balancing actions it will do so by transacting in the wholesale market or balancing platform. Only where the wholesale market or balancing platform does not provide, or is expected not to be able to provide the response the TSO is looking for, will the TSO use other tools.

Specific assumptions

No specific assumptions have been made on this issue as of yet.

Development of the concept

Also, as simply described in the following illustration, the balancing rules must define the role that TSOs and network users will each play in respect of balancing tools and balancing rules, for exercising their responsibilities.



ENTSOG recognises that the roles and responsibilities of both the TSOs and network users as envisaged in the framework guidelines may be different depending on:

- Application of any Within-day obligations;
- Application of any interim measures.

Roles

The roles of the transmission system operator may be undertaken by different parties on behalf of the TSO, and the framework guidelines recognise this stating 'where there is a party different from the TSO, references in the framework guidelines relate to that party'. Examples of such roles are:

Balancing agent	This party is responsible for procuring the balancing tools and services needed by the TSO to balance the system(s).
Settlement agent	This party manages the financial flows on behalf of the TSO, for example, settlement calculations, statements, invoicing, etc.
Information flow agent	This party is responsible for gathering, processing and providing network users with the information they require to manage their portfolio.

Considerations for Network Code

It is envisaged that in order to achieve the requirements of the network code, the roles and responsibilities of both TSOs and network users need to be considered/clarified during the development of all the main sections of the network code itself.

We now examine the features of the "Balancing Target Model" and will examine later in the document the interim steps which can be used in the transition to this model.

7 TSO balancing actions

The framework guidelines

Target model

"The network code on gas balancing shall define standardised products and related balancing services that TSOs may buy or sell. These standardised products shall include short-term products, which are traded either on a physical basis or through title transfer. They may also include long-term products of up to one year. The long-term products may be either for a particular volume of flexible gas or an option to inject or withdraw a particular volume of flexible gas.

The network code on gas balancing shall require TSOs to maximise the amount of their gas balancing needs to be fulfilled through the buying and selling of short-term standardised products on the wholesale market (or, where the interim step applies, on the balancing platform). NRAs may design incentive mechanisms to encourage TSO's compliance with this requirement. The network code on gas balancing shall require TSOs' procurement and sale of flexible gas and balancing services to be market-based.

Interim steps

As an interim step, the framework guidelines allow TSO's to use Balancing Platforms where the wholesale markets is insufficiently liquid or where temporal and locational products required by the TSO cannot reasonably be procured on the wholesale market. The network code on gas balancing shall also include arrangements for TSOs holding the flexible gas in long term contracts to release back to the market any surplus gas which is not required for balancing purposes in any given balancing period, in order that network users have access to greater volumes of flexible gas. Both of these topics are covered in other sections of this document.

Introducing the Concept

To avoid excursions beyond the acceptable operational envelope, TSOs need to have access to balancing tools to enable them to manage the system. The framework guidelines require the TSO's to procure these tools in a market-based manner. This section proposes descriptions of the different balancing tools the TSO can purchase to keep the system within its acceptable operational limits.

The three types of balancing tools which are envisaged by the framework guidelines can be illustrated by these criteria.

Criteria	Standardised Short Term Products	Standardised Long Term Products = Standardised Balancing Service	Non-Standardised Balancing services
Utilisation	One-time usage *Balancing tool providing flexible gas on a one-time basis*	Recurrent Usage *Balancing tool that can provide flexible gas on a recurrent basis (or that provides an option to use flexible gas on a recurrent basis).*	Recurrent Usage *Balancing tool that can provide flexible gas on a recurrent basis (or that provides an option to use flexible gas on a recurrent basis)*
Duration	Short Term *balancing tool that provides gas intraday, day-ahead, two days-ahead of gas delivery or for 2 days over a weekend.*	Long Term *balancing tool that provides gas for more than two days and up to one year, i.e. including weekly, monthly and annual durations.*	Long Term *balancing tool that provides gas for more than two days and up to one year, i.e. including weekly, monthly and annual durations.*
Standardisation	Standardised *Tool that has standard characteristics (e.g. duration of flexible gas provision, lead time for providing gas, etc).*	Standardised *Tool that has standard characteristics*	Not Standardised *Tool with tailor-made characteristics, or anything not defined as a standardised product.*
Type of counterparty	Network user	Network user or Infrastructure Operator / Provider	Network user or Infrastructure Operator / Provider

It is proposed to consider Standardised Long Term Products as the same category of Balancing Tools as Standardised Balancing Services. Indeed, on the one hand "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 acceptable operational limits, for example the ability to inject/withdraw gas into/ from storage"* and on the other hand, we do not see the need, for TSO-balancing purposes, for buying gas for longer periods than a day or two days. So any balancing tool that would provide long-term flexible gas would be a Balancing service.

In the balancing tools, a distinction is made between standardised and non-standardised.

The three types of balancing tools are further described below.

Standardised Short Term Products

For the purpose of the network code 'Standardised Short Term Products' will be seen as short-term products which are traded either on a wholesale market or on a balancing platform. The framework guidelines require TSOs to maximise the amount of their gas balancing needs to be fulfilled through the buying and selling of short-term standardised products on the wholesale market (or, where the interim step applies, on the balancing platform). The Regulation 715/2009 also requires that balancing rules are market based.

The following types of standardised short term products can be envisaged:

- **Balance-of-day products** (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.
- I**ntra-day products** (gas to be transferred during a specific window during the day) through title transfer at the virtual trading point.
- B**alance-of-day products at a specific entry or exit point** of the network through a physical transfer (also called "physical market trade").
- **Intra-day gas at a specific entry or exit point of the network** (during a specific window during the day), through a physical transfer.
- 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 offtaken in accordance with the agreed profile.

ENTSOG expects that the above standardised short term products provide sufficient options for a TSO to balance the system in an efficient and safe manner and can be provided either via a wholesale market and a balancing platform. However it is not likely that a wholesale market exchange will provide all the products unless it is adequately paid for these services.

Balancing Services

In addition to buying and selling of short term flexible gas through Standardised Short Term Products, the TSO may purchase Balancing Services to manage those situations in which the buying/selling of Standardised Short Term Products is not sufficient for the TSO to keep the system within acceptable operational limits.

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

- **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 a standardised products within an adequate timescale, then Balancing Services shall be used instead of Standardised Short Term Products.

Two types of Balancing Services shall 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 end-of day or intraday
    - 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 storage

- **Non-Standardised Balancing Services** which are tailor-made and designed to resolve situations where the above Standardised Balancing services are inadequate to assure the system can be managed within an acceptable operational envelope,. 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 (e.g. a non standardised storage contract)

Merit Order

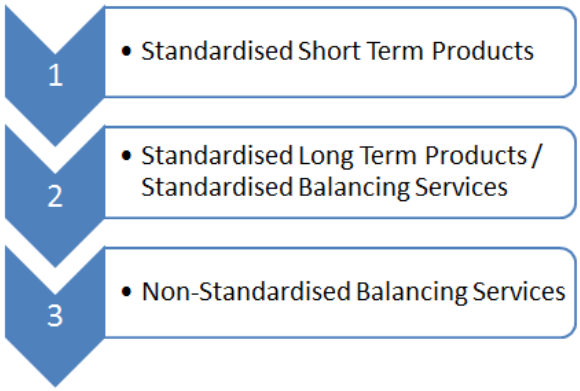
As mentioned earlier, the framework guidelines require the network code to require TSOs to maximise the amount of their gas balancing needs to be fulfilled through the buying and selling of short-term standardised products on the wholesale market (or, where the interim step applies, on the balancing platform). ENTSOG believes that to deliver this requirement, 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:

1. The TSO should first seek to use one of the Standardised Short Term Products. The short term products to be used should be adapted to the balancing action required for the system.
2. When the Standardised Short Term Products cannot provide an adequate response to the system imbalances (according to the criteria described above), TSO's shall use Standardised Balancing Services

3. 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 priority is shown graphically below:



Considerations for Network Code

The following topics will be considered when drafting the Network Code and ENTSOG will seek input from stakeholders during the SJWS:

- The definition of the different types of balancing tools (Standardised Short-Term Products, Standardised Balancing Services / Long Terms Products, Non-Standardised Balancing Services)
- The determination of the exact list of Standardised Short Terrm Products and views about the further definition of these products.
- How the Network Code should clarify the circumstances in which TSO's should consider using Balancing Services instead of Short Term Standardised Products?
- Whether the Network Code should include a merit order to prescribe the Balancing Tools hierarchy as a means of promoting the use of a wholesale market by TSOs and what forms of incentives could be developed to encourage and reward TSOs use of wholesale markets so as to accelerate the development of liquidity of those markets.
- The options for acquiring locational and temporal products, if a Balancing Pplatform is the only source, after the time for interim measures expires.

8 Within-day obligations

Introduction to the concept

The balancing regimes need to be developed to accommodate the needs of network users and keep the systems within acceptable physical operational parameters. European transmission systems were mostly designed in times where the TSO function was part of an integrated company, and in order to manage the within-day positions of the network, the integrated company could control the entry flows to ensure they matched the demand by customers. In the new market environment TSOs have limited direct control over, for example, entry flows on to the system and in the near future, demand is expected to be less predictable because of intermittent production of electricity (assuming gas plant balances intermittency of wind, solar, etc.) and different transportation paths arising from different sourcing arrangements for gas (particularly European gas importation). Given these factors the TSO may need a combination of balancing tools to influence the within-day positions of network users or adequate tools to be able to influence inputs and/or offtakes on the system. Whilst the objective of the network code is to minimise the role of the TSO, in many systems within-day obligations or incentives are expected to continue to play a key role to support the TSO in keeping the system within an acceptable operational envelope.

The framework guidelines

The aim of the network code should be to minimise the need for TSOs to take balancing actions, subject to consideration of the resultant impact on network users. Section 2.1 of the framework guidelines acknowledges that this is best achieved by a requirement on network users to take primary responsibility for balancing their inputs and off-takes: “The network code on gas balancing shall set out that network users, through their portfolio balancing activities, shall take primary responsibility for matching their inputs against their customers’ off-takes from the balancing zone during the relevant balancing period. The principle is to provide, as much as possible, for network users to balance their individual portfolio, which is likely to minimise the need for TSOs’ balancing actions”.

This principle is detailed in section 4.2 of the framework guidelines, where it is stated “Where the TSO needs to take balancing actions regarding the system’s position during the day, the network code on gas balancing shall provide for the TSO to impose specific obligations relating to network users’ inputs and off-takes during the gas day (“within-day obligations”). This shall only occur where, in order to ensure system integrity and to minimise the need for the TSO to take balancing actions, it is necessary to incentivise network users to take appropriate balancing actions during the day.”

The framework guidelines limit the choice of within-day obligation through several requirements:

1. “Within-day obligations shall not act as an undue barrier to cross-border trade or to new network users entering the market”.
2. “Within-day obligations shall only be adopted once network users are provided with sufficient information to enable them to comply with the obligations”.
3. “Within-day obligations shall not undermine the principle of a daily balancing regime, i.e. the main costs to be incurred by network users in relation to their balancing obligations shall relate to their position at the end of the day in accordance with Section 5 of these framework guidelines.”
4. “Where such within-day obligations apply, the TSO may impose on network users a charge for failing to meet the obligations. This charge shall be, to the extent possible, cost reflective and shall not pose any undue barriers on new entry into the European markets or on cross-border trade. The network code on gas balancing shall prohibit the imposition of obligations according to which network users are financially settled to a position of zero during the gas day”.

5. “Charges relating to within-day obligations shall only be a small proportion of any imbalance charges”.

The framework guidelines also indicate that the network code shall require the TSO to meet the following conditions before imposing a within-day obligation;

- Publically consult on any specific within-day obligation it proposes to impose, including the methodology and assumptions used in arriving at the conclusion that the conditions set out above apply. The proposal for a within-day obligation shall include analysis of the likely financial impact on network users, the effect this may have on market entry, cross-border trade, hub liquidity and demonstrate that it is not discriminatory.

- Seek NRA approval. In deciding whether or not to approve such within-day obligations, the NRA shall consider whether the benefits in terms of the economic and efficient operation of the transmission system outweigh any potential negative impacts. Where a NRA has a concern that the obligations proposed by the TSO may adversely impact on cross-border trade, the NRA may seek an opinion or a recommendation from ACER, based on the provisions of the Regulation (EC) 713/2009 (the “Agency Regulation”). ACER shall monitor the balancing provisions, including within-day obligations and may request the relevant NRA to review any obligations which appear to conflict with the paragraph above.

Development of the concept

Within-day obligations or incentives referred to in this document are specific obligations or incentives imposed through the balancing rules on network user’s inputs and off-takes during the gas day. The objective of these obligations or incentives is to keep the system within an acceptable operational limit whilst minimising the need for TSO balancing actions.

The difference between an obligation and an incentive is the following:

- An obligation is a course of action to which a network user is bound: the requirement is absolute and is enforceable;
- With an incentive, the network user has a choice either to stay within the specified ranges or to go beyond them and face associated financial consequences. These charges may reflect the cost of the TSO balancing actions triggered by exceeding the specified limits and can take two different forms
    - Costs related to the flexibility needed by the TSO to manage the generated divergence (generally these costs are called “structuring costs”); no settlement of the network users’ balance position is made (the network user does not buy/sell gas from the TSO)
    - A partial within-day settlement of the network user’s divergence is made (for that part of the imbalance that is beyond the specified range).

For the remainder of this section we use the term ‘Within-day obligation (Incentive)’ to capture the above.

Within-day obligations (Incentives) are aimed at reducing TSO’s balancing actions within-day. As such the design/specifications of Within-day obligations (Incentives) will depend on both network topology and the flow scenarios that need to be accommodated. The network topology is well understood by the relevant TSOs, but future flow patterns remain uncertain.. The criteria to introduce Within-day obligations (Incentives)could be based on historical observations. However, changes in the balancing regime and Within-day obligations (Incentives), gas price variations or availabilities of storage capacities may lead to significant changes to future gas flows, and may mean that historical based analysis is not the most appropriate method.

Therefore, when considering introducing Within-day obligations (Incentives), a number of factors relating to aspects of the individual transmission system can be examined, including the profile of entry and exit flows on the system and available conversion or blending capacity in or between sub-networks with different gas quality specifications (e.g. calorific value, gas composition)

Consideration: Criteria on *choice for Within-day obligations (Incentives)*

Since a global calculation methodology ("one-size-fits-all") could not evaluate the need for Within-day obligations (Incentives)in very different transmission systems across the EU, ENTSOG understands the approach of the framework guidelines of tasking the evaluation of the need of Within-day obligations (Incentives) to individual TSOs and national regulatory authorities, with ACER providing an opinion or recommendation to NRAs if requested, while the balancing network code sets out the detailed criteria for such an evaluation.

Types of Within-day obligations (Incentives)

Within-day obligations (Incentives) may be classified into three main types: obligation (incentives) on system imbalance, obligation (incentives) on network users' portfolio and obligations (incentives) on entry or exit points.

The two first types of Within-day obligations (Incentives) are only credible when within-day information[5] on gas flows is made available to the network user. This information may either be the information used to calculate the balancing charges or be a good proxy for the information used to determine the balancing charges. Network users will then be able to monitor and manage their exposure to within-day imbalance charges and contribute to balancing of the system within-day.

The three types of Within-day obligations (Incentives)are explained below, together with some worked examples

1. Obligations (incentive) on system imbalance

With this type of obligation, the network users have a joint obligation with the TSO to keep the whole system balanced without a requirement on each individual portfolio to keep cumulative imbalance within a specified range.

When the sum of the network user's system imbalance reaches the agreed limit, this will trigger a balancing action by the TSO and some form of cost targeting to those that are deemed to have caused the action. Thus imminence of a balancing action creates a potential exposure to network users via a financial consequence, thereby providing a financial incentive to eliminate the TSO balancing action requirement. This impact may differ for those network users who have caused the action to be triggered and those that helped keep the system within the specified range.

[5] Dealt with in later chapter

Worked Example: Obligation (incentive) on system imbalance

The most important aspects of this regime are:

- Every market party is responsible for its own imbalance position and should be able to manage this position based on adequate information availability.
- If so required, the TSO will restore an acceptable operational position at system level. The information concerning system balance and the means by which the TSO maintains and, if necessary, restores an acceptable operational position are transparent and market-based (to the extent possible).
- Market parties are encouraged to help the TSO to maintain and if necessary restore the system position and may be rewarded for doing so; market parties that cause system imbalance will be charged on a cost-reflective basis.

Before the gas day starts, network users send in a forecast containing predictions of their entries, exits and trades. During the gas day the TSO compares this forecast with the actual allocation on a near real time basis to determine the portfolio imbalance. The calculated imbalances per portfolio are accumulated and shared with market parties, on an individual basis and the summation of all imbalances is shared with the entire market.

The TSO monitors the overall system imbalance and takes corrective action if necessary. Network users will be aware of the likelihood of the TSO taking a balancing action by the shared status of the overall system imbalance. This might be aided by a colour code scheme, the colours indicating the potential requirement and the necessary timeline of the balancing action.

2. Obligations (incentives) on network user's portfolio

Several types of within-day obligations (incentives) on individual network users portfolio's can be fashioned:

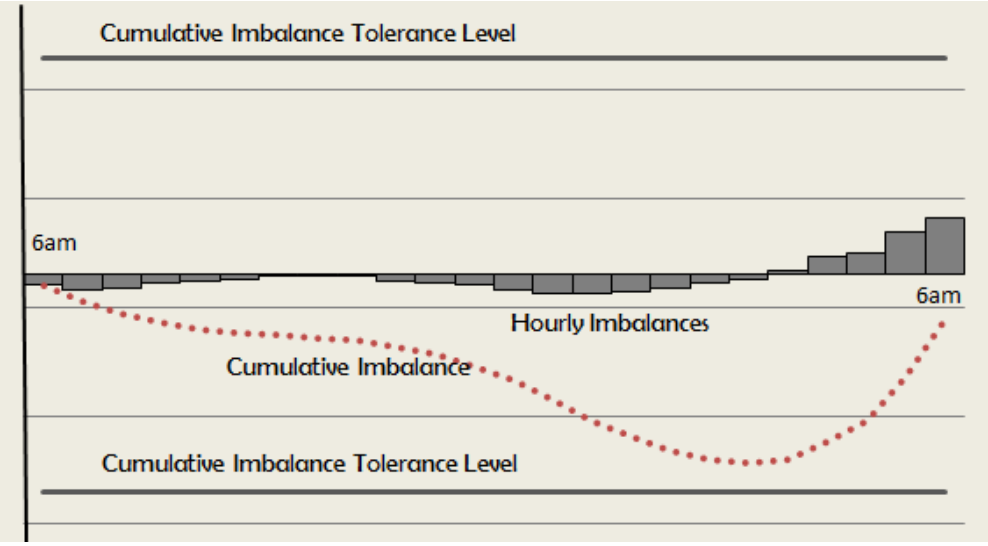
- *Hourly obligations or incentives (or "sub-daily" obligations/incentives):* every hour (or every sub-daily period such as "4 hours") network users are incentivised or obliged to match the sum of the injections and the sum of the off takes from the system. Please note that this particular obligation (incentive) is treated in an upcoming section.
- *Hourly obligations or incentives with tolerances (or "sub-daily" obligation):* every hour (or every sub-daily period such as "4 hours"), network users are incentivised or obliged to keep the difference between the sum of the injections and the sum of the off takes from the system within predefined amount of variation (called within-day hourly imbalance tolerance)
- *Within-day cumulated imbalance obligation or incentives with tolerances:* network users are incentivised or obliged to keep the cumulative imbalance of their portfolio within a pre-defined amount of variation (called within-day cumulative imbalance tolerances).

Worked Example: Examples of obligations/incentives on network users' portfolio

within-day

In this example the network user is incentivised to keep its cumulative imbalance within a pre-defined amount of variation or within-day cumulative imbalance tolerance. It is best shown using an illustration:

Individual network users illustration



In this example the network users cumulative imbalance does not exceed the tolerance levels meaning no charge is applied.

3. *Obligations (Incentive) on entry/exit points*

Depending on the applicable contractual framework of the balancing system, obligations (incentives) on entry/exit points can either be on network users or perhaps via a facility operator (e.g.: power plant operator, adjacent infrastructure operator). Several types of obligations (incentives) on entry/exit points could be envisaged and these can be used individually or in any combination:

- Information provision obligation (incentive) to provide the TSO with the expected within-day profile
- Obligations (incentives) on limitations of within-day flow variations, according to either predefined rules or circumstances on the day
- Obligation (incentive) to follow a TSO's instruction for a within-day flow variation, when the TSO expects a network constraint

Examples of this type of within-day obligation (Incentive) include:

- Requirement to feed in at a flat rate made with the operator of an off-shore pipeline
- Requirements on ramp-rate made with end-consumer/operator.

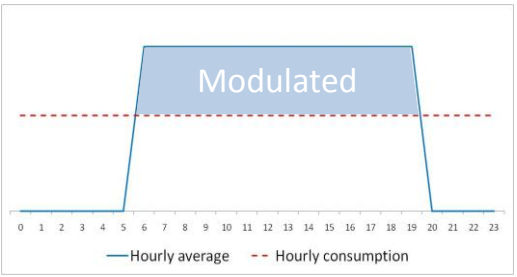
This type of WD obligation (Incentive) should where necessary be structured to have minimal impact on cross-border trade.

Worked Example One: Examples of obligations/incentives on exit points[6]

An example of within-day obligations/incentives on Exit points

The Intra-day flexibility contract has to be signed by customers which generate big within-day constraints on the system. The reference to consider intra-day swings could be defined as the "**modulated volume**". The daily modulated volume is the sum, for all hours in a gas day), of the differences in absolute value between the recorded hourly consumption and the average daily consumption, divided by two.

Any user presenting a modulated volume in excess of a threshold must subscribe to a specific intraday flexibility service, whatever its gas usage. This user is called a highly modulated Site.



Every Day D-1, the network user declares to the TSO for days D, D+1 and D+2 an hourly schedule. On the basis of the above elements, every Day D-1, the TSO will notify the network user whether or not the schedule declared for Day D is feasible. Every Day D-1, the TSO will notify the network user of the notice period applicable for Day D.

Notice Period: minimum period between the time when the network user informs the TSO to notify a modified schedule for the Highly Modulated Site and the start of its actual implementation by the network user. This period allows the TSO to take the operational measures that will guarantee security and continuity in the operation of the *network.*

[6] Can also apply to entry points

Worked Example Two: Within day obligation on entry /exit points

Obligation of information provision on expected within-day profiling

- At day ahead, adjacent facility operators, Interconnectors and storage operators are required to submit flow notifications, which provide details to the TSO of the profile for the expected entry and exit flow to or from the system reflected in hourly intervals.

- At day ahead DSOs and power stations are required to submit flow notifications, which provide the TSO with a profile of the expected offtake from the transmission system in hourly volumes.

Limitations of within-day flow variations, according to predefined rules.

The aforementioned facility operators are also expected to provide revised flow notifications if there is any increase or decrease in rate of supply or offtake from the previous notification relating to any within-day period. The level of variation from the previous notification and the prevailing flow, must comply with set tolerances and notice periods. Network users may submit a revised nomination if the change in flow will affect their end of day position.

Obligation to follow TSO's instruction on within-day flow variation when the TSO expects a network constraint

The TSO has a number of constraint management tools (gas balancing and capacity) available to it and these include:

Entry - Flow advice can be issued by the TSO in the event of a constraint, to protect the operating pressure of a pipeline and allow the TSOs to request operators to turn down the flow.

Exit - Within-day Flow Reduction, this involves the TSO notifying users at an exit point of a flow reduction request. Network users will submit a revised notice to reflect any accepted request.

Requirements on within-day obligations (Incentives)

If there is a within-day incentive then the framework guidelines put a requirement on the level of the incentive: "the main costs to be incurred by network users in relation to their balancing obligations shall relate to their position at the end of the day".

This text appears to have been written on the assumption that managing within-day positions of the system is a relatively small activity compared to managing the end-of-day position of the network. This will not be true for all transmission systems.

The additional text in the framework guidelines was added in the final version released. ENTSOG raised in its gas balancing kick-off meeting in late October the difficulty in interpreting this clause, for development into a network code. Discussions with ACER on this in the near future are important, so ENTSOG can examine the clause in a meaningful fashion with stakeholders. In the interim the requirement can be interpreted in several different ways, for example:

1. For each individual network user and for every single day the main cost shall relate to the position end-of-day

2. For each individual network user over a longer period the main cost shall relate to the cost for settlement of end-of-day positions over that period
3. The total cost over all network users for a single day shall mainly relate to the settlements of end-of-day positions
4. The total cost over all network users over a longer period shall mainly relate to the settlements of end-of-day positions.

Allowed and not-allowed within-day obligations (incentives)

The framework guidelines prohibit strict obligations (incentives) on network users to match total inputs and total outputs. All the types of within-day obligations (incentives) described above have a strong link with genuine system needs and should be allowed as they do not conflict with this very strict restriction.

The use of these within-day obligations (incentives) should however be analysed, taking the following aspects into account:

1. The fulfilment of genuine system needs (and thus system integrity) has the highest priority and the selected within-day obligations (incentives) have to be made in consideration of available balancing actions and their appropriateness to meet this target.

2. The use of these within-day obligations (incentives) should be weighed against the alternative of the TSO taking more balancing actions (such as buying/selling on the wholesale market or using balancing services). Here the costs have to be compared and the level to which these costs can be targeted to individual network users or groups of network users needs to be considered.

3. The impact of the within-day obligations (incentives) on further development of the wholesale market needs to be taken into account.

4. Also, the effect of the use of these within-day obligations (incentives) on cross-border trade and on possible barriers to new entrants shall also be assessed.

5. The impact on end-consumers who can face within-day obligations (incentives)

Considerations for network code

How should the requirement on within-day obligations (Incentives) be interpreted to meet the other provisions in the framework guidelines?

Will the requirement provide a sufficient level of harmonisation?

To what extent should the criteria for designing within-day obligations (incentives) form part of the network code?

9 Daily Imbalance Charges

Introduction of the concept

Approaches to calculating imbalance charges vary across Europe. In some balancing zones the imbalance charge is not related to the cost of the TSO procuring or selling gas. Instead the charge is either a fixed fee, which is determined in advance, or is indexed to an external reference price in a commodity market.

This section describes how imbalance charges are intended to apply and what the key considerations might be when translating the concept into a network code. The imbalance charges applied by a TSO to a network user (or payment received by a network user) are driven by a network users imbalance quantity (the differences between their inputs into and offtakes from the balancing zone). An imbalance price is applied to these volumes to incentivise network users to minimise their imbalances thereby reducing the TSOs role in balancing the system.

The framework guidelines

The framework guidelines provide that the Network Code shall require TSOs to publish transparent methodologies for the calculation of imbalance charges and establish harmonised principles for these imbalance charge methodologies. They also provide guidance on the methodology together with the requirement that the methodology should provide appropriate incentives on network users to balance their portfolios, without deterring new entry or impeding the development of competitive markets. Specific definitions are provided on key terms such as 'Imbalance', 'Imbalance Charge', Marginal Buy Price' and 'Marginal Sell Price'.

Specific Assumptions

No specific assumptions were made in order to develop the imbalance charge concepts described below.

Development of the concept

The" **Imbalance charge**" is the charge applied by a TSO to network users (or payment received by network users) for financial settlement of the differences between their inputs into and offtakes from the gas transmission system (balancing zone). The imbalance charge for each network user for each Balancing period is determined as:

Imbalance Charge = Imbalance Quantity x Imbalance Price

The **"imbalance Quantity"** for each balancing period is the difference in energy of a network users Inputs and Offtakes to and within a balancing period, where,

> **"Inputs**" into the Balancing Zone, for example inputs can include gas delivered via interconnection points, LNG terminals, production facilities, storage facilities withdrawals, adjacent areas and purchases at the virtual trading point.

"Offtakes" from the Balancing Zone, for example offtakes can include gas taken via consumers directly connected, interconnection points, adjoining distribution systems, storage facilities injections, adjacent areas, and sales at the virtual trading point.

If the inputs of a network user exceed their outputs, then this is an over-delivery and they are 'long' gas.

If the inputs of a network user are less than their outputs this is an under-delivery and they are 'short' gas.

The network code development process will explore the sources that contribute to inputs and offtakes.

An "**imbalance price**" will be determined for each Balancing Period and consist of a "marginal sell" price that is applied to over-deliveries of gas by a network user and a "marginal buy" price that is applied to under-deliveries by a network user, where;

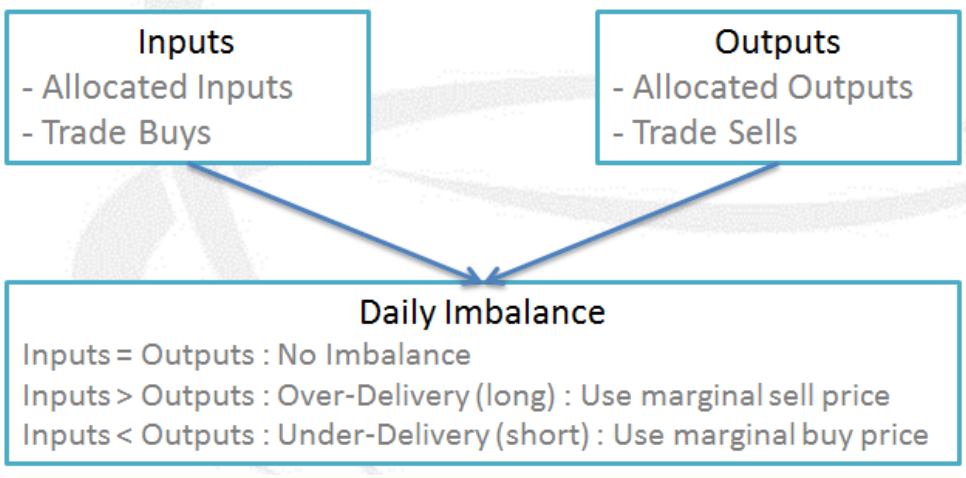
Marginal Buy Price – a price based on the higher of:

- the highest price of any gas balancing trading to which the TSO is a party in respect of the balancing period (excluding locational or temporal products); and
- The weighted average price of gas traded in respect of that day (this price may include a small adjustment to incentivise network users to balance).

Marginal Sell Price – a price based on the lower of:

- the lowest of any gas balancing trading to which the TSO is a party in respect of the balancing period (excluding locational or temporal products); and
- the weighted average price of gas traded in respect of that day (the price may include a small adjustment to incentivise network users to balance).

The charge may be either a debit or credit from the TSO to the network user depending on whether they had a positive or negative imbalance quantity.



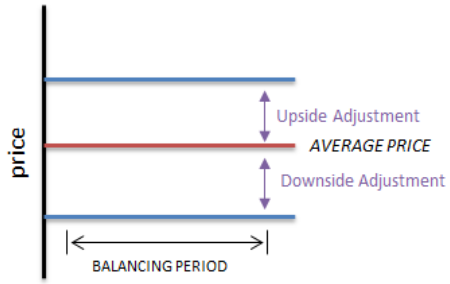
The framework guidelines require that where the TSO uses either the wholesale market or a balancing platform, including a joint balancing platform to buy or sell balancing gas, the Network Code shall set imbalance charges based on the marginal sell price or marginal buy price. The marginal buy price and the marginal sell price also apply when the TSO has taken no action, when the imbalance charge may include a small adjustment to incentivise

network users to balance their portfolios. This adjustment shall be designed and applied in a non-discriminatory manner, so that it does not deter market entry or impede the development of competitive markets

Some illustrations are provided below to demonstrate how the marginal buy price and marginal sell price might be set, for a Balancing Period:

The red stars represent a balancing action carried out by the TSO. It should be noted that the average price is depicted as a straight line. In reality it will move during the balancing period, although a single price calculated at the end of the day once all relevant trades are known, will apply on an ex-post basis, used for the determination of the imbalance prices.

Example 1 – No TSO Balancing Actions

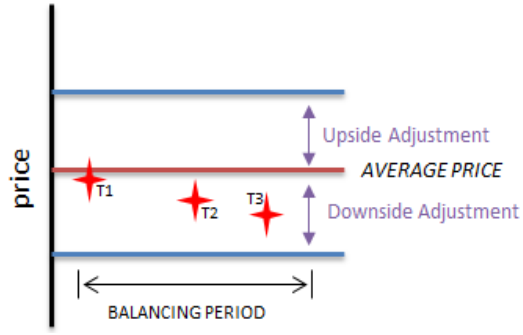


In **Example 1** the imbalance prices are set as:

Marginal Sell Price: The average price less the downside adjustment (as there are no TSO trades).

Marginal Buy Price: The average price plus the upside adjustment (as there are no TSO trades).

Example 2 – Some TSO Balancing Actions

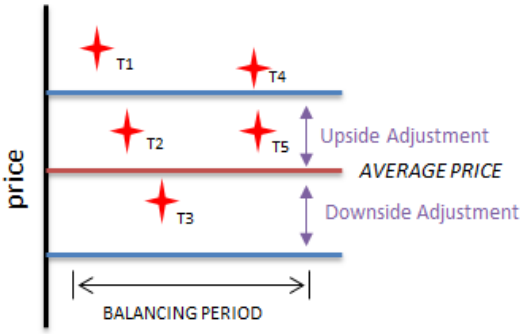


In **Example 2** the imbalance prices are set as:

Marginal Sell Price: The average price less the downside adjustment (as there are no TSO trades at a lesser price_.

Marginal Buy Price: The average price plus the upside adjustment (as there are no TSO trades at a greater price).

Example 3 – More TSO Balancing Actions



In **Example 3** the imbalance prices are set as:

Marginal Sell Price: The average price less the downside adjustment (as there are no TSO trades at a lesser price).

Marginal Buy Price: T1 sets the price (as it is the highest of the TSO balancing actions and greater than the average price plus the upside Adjustment).

It should be noted that incentive mechanisms are often used to encourage the TSO to minimise balancing costs and this concept is explored in another part of this document.

Considerations for Network Code

The concept on balancing charges is quite well developed within the gas balancing framework guidelines.
However, there are some decisions that will have to be made when translating this concept into a Network Code:

- The establishment of the quantities that will feed into the imbalance quantity determination.
- The exact definitions of each parameter used within the imbalance charge methodology, for example:
  - The average gas price for a balancing period:
  - Should the price effecting balancing actions by a TSO be limited to within-day actions only? If not, why?
- Whether the Network Code should include principles or rules of how the upside and downside adjustment to the marginal prices where no balancing action has been taken by the TSO, should be determined – how can they be calculated in such a manner so as not to deter new entry and impede the development of competitive markets.
- Whether the Network Code should include principles or rules around the timing of both the Initial and final imbalance charge and allocation information provided to network users.

10 Settlement / Neutrality

Introduction of the concept

The TSO shall be cash neutral with respect to all its balancing activities. The TSO shall only recover from all network users, any costs incurred from undertaking balancing activities that are not directly attributable to a network user. This section looks at what charges can be attributed directly to network users and the means of recovering the charges for those costs / revenues that cannot be attributed to a specific network user.

The framework guidelines

The framework guidelines state that the Network Code shall require TSOs to be cost neutral with respect to its balancing activities, levy imbalance charges separately from other transmission charges and that imbalance charges shall be levied on the network users that were out of balance at the end of the balancing period. The framework guidelines also require that the TSO shall only recover from all network users, any costs incurred from undertaking balancing activities that are not directly attributable to a network user.

Regulation (EC) 715/2009 provides that Member States shall ensure that transmission system operators endeavour to harmonise balancing regimes and streamline structures and levels of balancing charges in order to facilitate gas trade.

Specific Assumptions

It is assumed that in order to satisfy the above requirements specified in the framework guidelines a settlement/neutrality mechanism should be included in the Network Code. The provision set out in Regulation 715 places a higher requirement on streamlining structures and balancing charges than the framework guidelines do.

Development of the concept

The balancing neutrality mechanism is an arrangement whereby the TSO remains cash neutral with regards to the balancing activities undertaken in its role as the system Residual Balancer and the settling of network users imbalance charges ("imbalance settlement process") – i.e. it does not make or lose money from this role.

The balancing neutrality mechanism enables the TSO to recover and appropriately apportion charges and revenues related to its balancing activities. All the money that changes hands during the imbalance settlement process and any TSO market balancing actions costs feed into a "neutrality pot". Other charges such as scheduling charge payments may also feed into the pot. The balance of the pot (whether positive or negative) is apportioned back to network users:

ENTSOG believe there are four main groupings of financial features, within the balancing target model:

- Imbalance settlement
- Charges on Within-day Obligations (incentives)
- TSO Balancing Actions (can be for short or long term products)
- Other charges related to the TSOs balancing activities

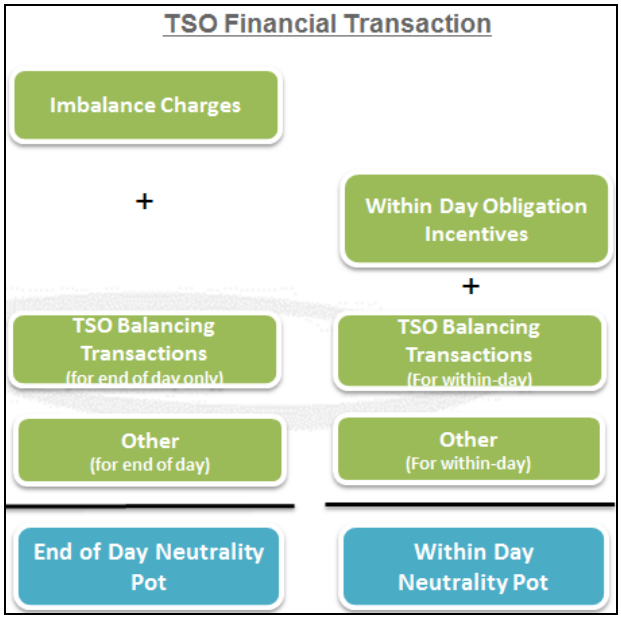
Considerations for Network Code

The concept of a balancing neutrality mechanism is not explicitly defined within the gas balancing framework guidelines and some decisions will have to be made when further developing this concept:

- The determination of the key principles and parameters of a neutrality mechanism
- Consideration as to whether separate neutrality mechanisms should be defined for both end of day balancing and within-day obligations (incentives) or whether one mechanism is appropriate. The illustration below is intended to demonstrate these two options:

Single Balancing Neutrality Mechanism

Dual Balancing Neutrality Mechanism



- The determination of the types of balancing charges that are appropriate to recover via this mechanism
- Consideration of how balancing neutrality charges should be recovered from network users – in terms of the frequency of the neutrality invoice and the exact basis of the neutrality apportionment.

11 Information provisions – TSO to Network User

Introduction of the Concept

The balancing target model gives network users the responsibility to balance their portfolio. This means as the demand changes or the forecast of demand changes that network users will be incentivised to track these demand changes to minimise their imbalance exposure. This will leave the Transmission System Operator (TSO) to carry out residual balancing actions (can include actions for overall network imbalance, locational balancing, etc.). The network user will be incentivised to balance its portfolio through the imbalance charge mechanism, which should be reflective of the TSOs cost of balancing, to the extent this is possible.

In undertaking this role the network user needs information to allow it to manage the risks associated with balancing its portfolio and the opportunities associated with offering flexible gas to others to balance their portfolios. This section addresses the information flows that network users will require and examines the steps required to deliver such information, and considers the frequency with which network users receive information from the TSO. As some of the information flows pertain to gas flows on the distribution system, Distribution System Operators (DSOs) cooperation will be needed to deliver the information from the TSO to the network users. In addition, the information provision will also allow network users to participate efficiently in wholesale markets (or balancing platforms).

ENTSOG and the DSO representatives have worked closely together to examine the framework guidelines and to try to understand what their implementation is likely to mean for both TSOs and DSOs. The parties have cooperated through:

- A monthly workshop in Brussels attended by ENTSOG, DSO representatives (Eurogas, CEDEC, Geode) and some specific DSOs.

ENTSOG appreciate the significant input provided by the DSOs to date and look forward to continuing this close relationship throughout the network code development phase.

Gas Regulation 715/2009

Article 21 of the Regulation states that TSOs shall provide sufficient, well timed and reliable on-line information on the balancing status of network users. No charge shall apply for the provision of information under Article 21. This information shall reflect the level of information available to the TSO and the settlement period for which imbalance charges are calculated

The framework guidelines

The network code on gas balancing contains several distinct information provisions:

(i) Overall status of the system in accordance with Chapter 3 of Annex 1 of the Gas Regulation;
(ii) Individual network user information;
(iii) Aggregate network user information
(iv) TSO actions to buy and sell gas from network users or other TSOs.

Specific Assumptions

The framework guidelines state that TSOs shall be cost neutral in relation to their balancing activities. In their discussions with DSO representatives, ENTSOG and the DSO representatives have assumed that both the TSOs and the DSOs will be remunerated for the capital and operational cost changes incurred to deliver the requirements of the framework guidelines.

Development of the Concept

In this section we examine each information requirement individually.

(i) Overall status of the system

The overall status of the system is intended to indicate to network users whether the TSO is likely to have to carry out any balancing actions which might affect the imbalance price to be set for that balancing period. network users might be particularly interested if they are in the same position as the system, meaning a potential greater exposure to a marginal price. The framework guidelines state that in order to ensure barriers to cross border trade are prevented; consistency across Europe is also required on how this information is published.

The framework guidelines indicate that in accordance with chapter 3 of Annex 1 of the Gas Regulation the network code on gas balancing shall provide that the TSOs publish, per balancing zone:

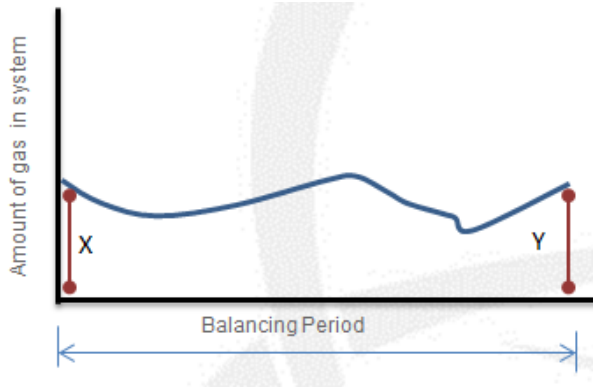
- The amount of gas in the transmission system at the start and end of each gas day; The forecast amount at the end of each gas day will also be published each hour;

  Alternatively

- TSOs shall publish the aggregate imbalance position of all network users at the start of each gas day and the forecast of the aggregated imbalance position of all users at the end of each gas day.

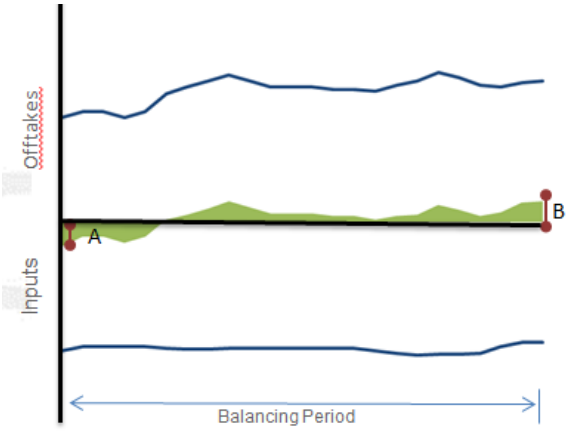
The diagrams below are intended to illustrate the options for publishing the overall status of the system:

Gas in the System **Or**



Description

Aggregate Imbalance



Description

For each Gas Day the amount of gas at the start of the gas day (X) and the forecast amount at the end of the Gas Day (Y) is published, with Y being updated on an hourly basis.

For each Gas Day the aggregate network users' imbalances at the start of the gas day (A) and the forecast aggregate network users' Imbalances at the end of the Gas Day (Y) is published.

Regulation 715 also states if the national NRA is satisfied that such information could give rise to potential abuse by network users, it may decide to exempt the TSO from this obligation.

(ii) Individual network user information

The framework guidelines indicate that the network code shall require TSOs to provide free of charge to each network user the available information regarding its inputs to and offtakes from the balancing zone at appropriate intervals during the balancing period in order for network users to balance their portfolios (the aggregate of a network users inputs and offtakes from a balancing zone. Network users may have more than one portfolio). Secondly the framework guidelines state that the appropriate interval shall be at least twice a day or more frequently if necessary to enable network users to meet their balancing requirements, and to comply with any within-day obligations (incentives).
The framework guidelines also state that in the absence of information being metered during the balancing period and in order to facilitate new entry, the network code shall oblige TSOs to provide a detailed forecast of the offtake volumes for non-daily metered customers at a day ahead stage, updated at least twice a day at appropriate intervals during the balancing period unless network users are able to fulfil their balancing obligations (incentives) with information provided day-ahead.

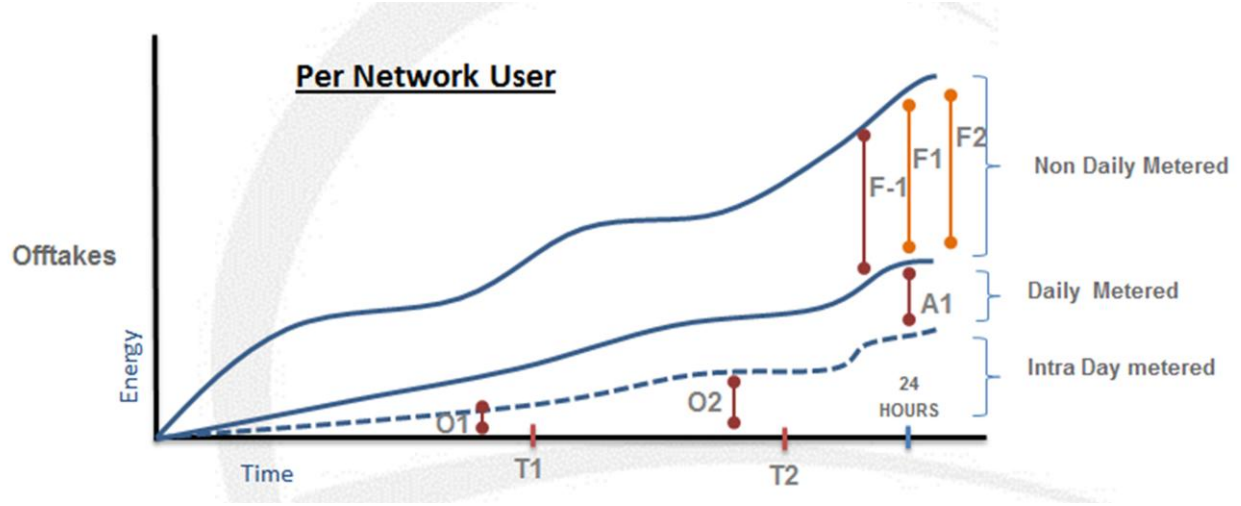
Considering input and offtake volumes, and information available to the TSO and DSO, we need to take into account the fundamental and technical different categories of information available to the TSO and DSO. The table below focuses on 3 categories we think it's necessary to consider in order to give a correct and adapted answer per category to the framework guidelines requirements.

Category	Description
Intraday metered	An input or offtake from the balancing zone whose meter value is read and collected at least twice within the balancing period; This type of meter will be telemetered and they are typically used for large gas demand loads such as power stations and very large industrial customers, although each system will have different volume thresholds and / or criteria for deciding which inputs and offtakes would have such a meter fitted. For intra-day metered customers, their offtake information is available for the TSO & DSO to provide to the network users. In some cases network users will already have access to this information or it may be provided directly from their customer, meaning it may be limited benefit from a TSO providing such information? Gas flows inputting the balancing zone are typically metered on an intra-day basis. In circumstances inputs allocated to network users are equal to the network users Nomination Confirmation. In this instance ENTSOG is keen to explore whether network users value within-day information and if so, why?
Daily metered	*An input or offtake from the balancing zone whose meter value is read and collected once per balancing period after the close of this period.* They are mainly used for industrial and large commercial customers, although each system will have different volume thresholds and / or criteria for deciding which customers would have such a meter fitted. They are often connected to both the transmission and distribution systems. By their very nature there is no within-day information at hand for this customer category.
Non-Daily metered	*An input or offtake from the balancing zone whose meter value is read and collected less frequently than once per balancing period.* These customers will most likely be domestic, small commercial, etc. An end of day consumption estimate can be derived using an algorithm based upon standard patterns for particular classes of load (perhaps reflecting weather sensitivities). NDM offtakes are often connected to primarily the distribution systems. There can be no real within-day information for these non-daily metered offtakes. However in some systems within-day information is provided. This information is derived from intra day metered infeeds of the distribution networks and from an algorithm based upon standard patterns for particular classes of load (sometimes reflecting weather sensitivities).

In order to understand what the information flows might look like to a network user in a daily balancing regime, a worked example has been included below. The portfolio information shown on the diagrams excludes any transactions carried out at the virtual trading point. **The diagram is not intended to represent a position rather to aid discussions in the SJWSs and the subsequent network code**.

Worked Example - Offtakes

In this example, the network user is provided with:



Non Daily Metered

- A day ahead forecast of F-1 which represents Network Users forecast NDM offtakes at the end of the balancing period, expressed in energy per day. The Network User is provided with at least two updates during the day, of its end of day forecast quantity, in this case F1 & F2, provided respectively at T1 & T2. The framework guidelines state F1 & F2 are not required if network users are able to fulfil their obligations with information provided day ahead. It should be noted that some TSOs provide within day information on NDM offtakes and therefore will not need to provide such an NDM forecast.

  NDM gas demand can change significantly depending on the type of customer, prevailing weather conditions, the day of the week, structure of network users' portfolio, etc. An algorithm can be carried out to support the forecasting of demand from this customer category. This algorithm is typically based on 'standard load profiles', which are a means of capturing forecasts of a consumers' gas consumption patterns against variables such as temperature, wind speed, day of week etc. Each customer can then be assigned a "standard" profile for its gas consumption meaning its demand can be predicted using the algorithm, allowing an aggregate forecast of end of day consumption per network user can be prepared.

Daily Metered

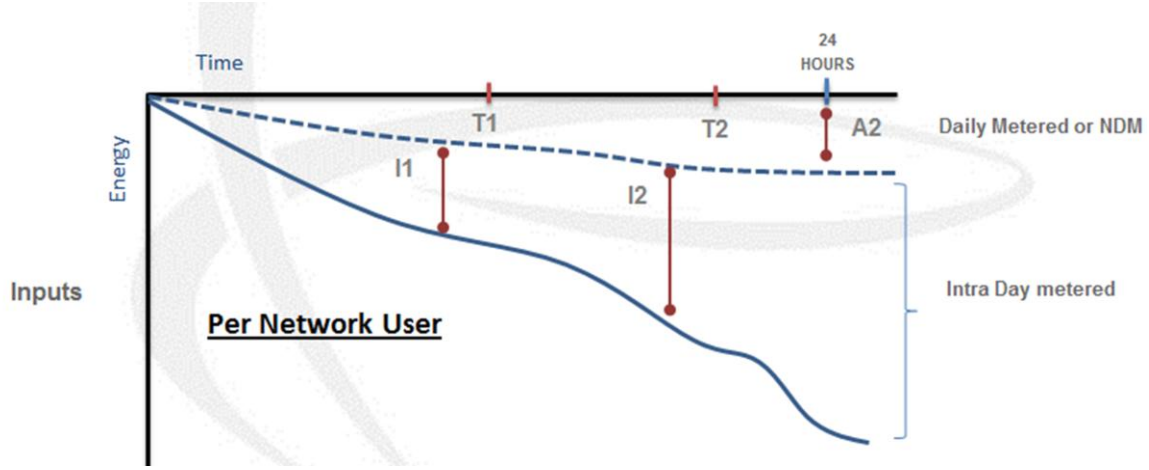
- Allocation for the daily metered offtakes after the Balancing Period, represented as A1.

Intra Day Metered

- The Network User is provided with at least two updates during the day of its intra day metered offtakes up-to a certain time in the gas day, in this case the volumes are O1 & O2, provided respectively at T1 & T2. The time difference in O and T in both cases represents the time required to collect and process data. In some cases Network Users will have this information directly available through their supplier or customer

Worked Example - Inputs

In this example the network user is provided with:



Daily Metered

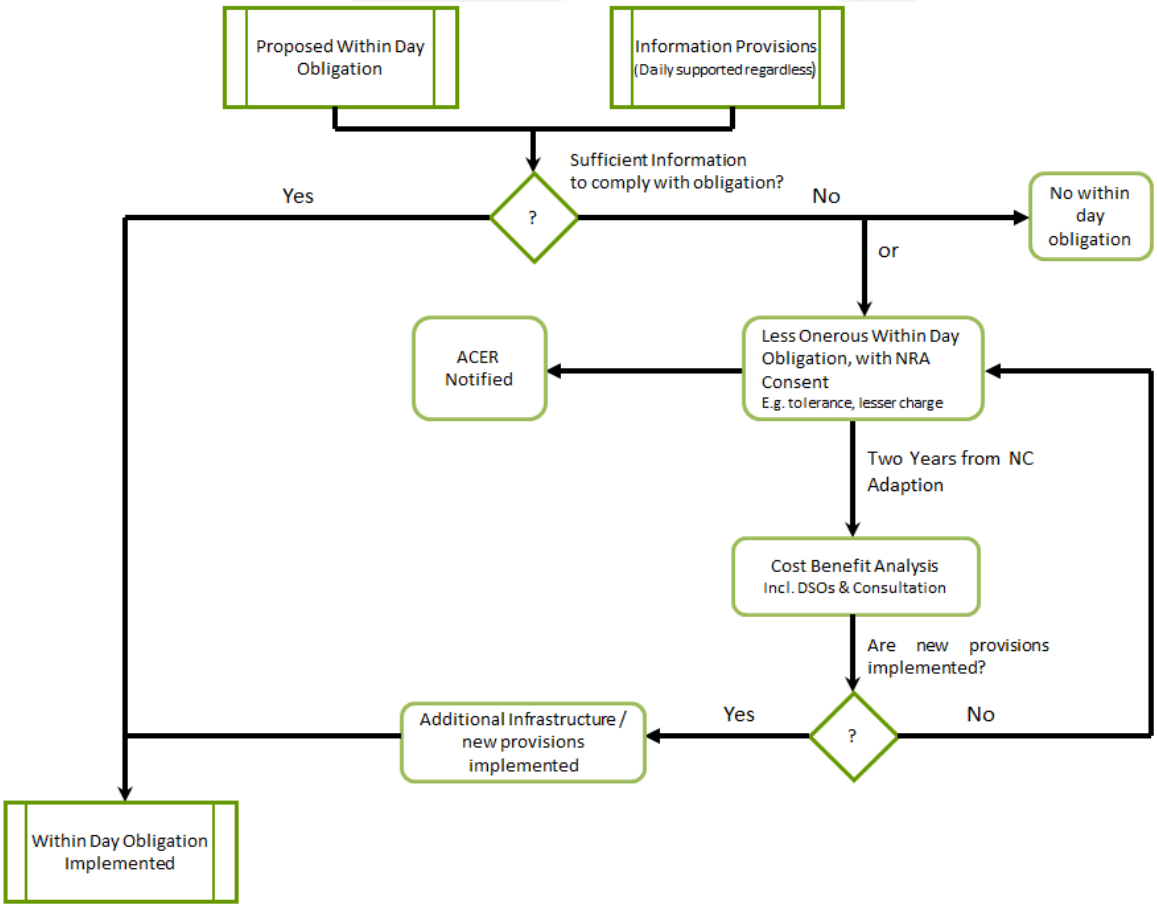
- Allocation for the daily metered inputs after the Balancing Period, represented as A2.

Intra Day Metered

- The Network User is provided with at least two updates during the day, represented as I1 & I2, at a specific entry point up to a certain point in the balancing period, provided respectively at T1 & T2. There are some specific points to note on entry point flows:
    - At certain inputs the allocation data equals the confirmed nomination, meaning the relevant information will relate to the nominations.
- This information is often published in aggregate per entry point, which is developed further in part (iii) of this section.

Information Requirements when within-day obligations (incentives) are used

The framework guidelines require that within-day obligations (incentives) shall only be adopted once network users are provided with sufficient information to enable them to comply with the obligations (incentives). It also provides for circumstances where the information is not deemed sufficient, together with a cost benefit analysis concept to test the value of collecting this sufficient information. ENTSOG have attempted to capture this scenario in the below diagram.



Options for making information available within the day

For offtakes that are intraday metered there will be information available which can be used to manage any within-day obligation (incentive) that are in place. For daily metered offtakes and non-daily metered offtakes, options for providing within-day information include:

- Change of metering / more frequent reading: This would result in creating only two categories: NDM and intra-day metered offtakes. It would increase capital and operational costs. Cost recovery would need to be addressed. Some systems will have a significantly larger amount of daily metered offtakes than others; viability would need to be considered in any cost benefit analysis.

- Diurnal load profiles: this is a significantly more extensive forecast algorithm than a daily forecast as it allocates gas to network users on a within-day basis, i.e. with a 24 hour profile. In conjunction with this algorithm for diurnal load profiles, extensive intra-day metering may be required to be placed across the system (or at least for samples that might be used in within profile allocation algorithms).

Provision of Sufficient Information

A key element of the network code development will be understanding what is deemed sufficient information for a within-day obligation (incentive).

Accuracy and timing of Information

There are different accuracy parameters that can be considered in terms of information accuracy:

- The accuracy of the forecast provided to network users versus the data network users are allocated against for balancing purposes;
- The accuracy of the data network users are allocated against versus the final reconciliation value.

(iii) Aggregate network user information

The framework guidelines indicate that the network code on gas balancing shall provide that aggregate network user input and off-take information is made available by the TSO in a clear, timely manner and on the same timescale to all network users in order for them to be able to take necessary actions to correct their imbalances. It is anticipated that the information on aggregate flows into and offtaken from the system provided by the new transparency requirements arising from EC 715/2009 are sufficient.

(iv) TSO actions to buy and sell gas from network users or other TSOs

Earlier in this document, several standardised short term products were introduced. Under this requirement when the TSO buys or sells gas to balance its system, the TSO will make information available to network users its trading actions which may have a direct impact on the imbalance price set for each Balancing Period. It is ENTSOGs initial view that network users interest here will be to understand what impact the balancing actions of the TSO may have on the imbalance price.

(V) Key TSO / DSO information provisions

In order to comply with the information provisions section there are some specific requirements the TSO will need from DSOs. The level of cooperation will of course depend on the information solution put in place in each system:

- Intra-day metered: meter readings (or confirmed nominations) as needed to satisfy the information provision requirements.
- Daily metered: this can vary from after the day allocation data to the information required to satisfy a within-day information requirement (if within-day obligation (incentive) necessitate this).

- Non Daily metered: depending on national circumstances either an NDM forecast or estimated hourly allocation updated when required or the information needed to create such a forecast. Where the DSO does not prepare such a forecast or allocation the Network Code will have to consider how this responsibility is allocated. Again information may be required to satisfy a within-day obligation (incentive).

The exact requirements responsibilities will clearly depend on the network code that is developed. There will be some parameters required to support the above transfer of information such as accuracy, timing, etc.

(VI) Format of Information

The framework guidelines state that information should be published in English as well as the local language in a harmonised format to be defined in the network code.

ENTSOG have identified some criteria in order to harmomise the provision of information:

- Available via the internet;
- Possible to use immediately;
- In a common unit (check with transparency WA);
- Using harmonised terminology.
- Be downloadable.

Considerations for Network Code

- Determination of the exact rules required with relation to the various information provision obligations (incentives) to be placed on TSOs. It is anticipated that the delivery of this suite of information (TSO balancing action information, information on the overall status of the system, NDM forecast of demand and where available individual network user input and offtake information) will enable network users to effectively balance their portfolios. The views of network users in this regard will be very important.
- It can be recognised that in relation to the provision of individual network user's inputs and offtakes data, that only certain information related to intraday metered customers is likely to be available to TSOs (or DSOs) within the day. However, the provision of within-day information is pivotal to the success of any within-day obligations (incentives) that a TSO may wish to use and therefore robust arrangements need to be defined with regards to the way input and offtake data is estimated by the TSO, in the absence of the actual within-day input and offtake information. The appropriate interval for the provision of network users input and offtake information should equally apply to any estimates provided.

- Determination of the exact co-operation required by DSOs in enabling TSOs to comply with the different network code requirements on information provision. We envisage that this will require clarification of the roles and responsibilities of both the TSO and DSO, determination of the exact information required and its timing, accuracy and format. The role of agents and incentives may also be factors that require consideration.

12 Information Provisions – Network User to TSO

Introduction of the Concept

The above section provided for network users with the information they require in order to be able to manage their portfolio. This section addresses the information the network user needs to provide the TSO, through nominations and re-nominations. Nominations and re-nominations are important as they provide TSOs with valuable information in terms of each network users intentions with regard to gas flows and the re-nomination process allows network users to change their inputs and offtakes in order to manage their portfolio.

The framework guidelines

The framework guidelines have a specific section on nominations and re-nominations;

If not covered by other legal obligations, the network code on gas balancing shall set out criteria for nomination and re-nomination procedures to be harmonised at both sides of the border at interconnection points and consistently across Europe, as these may be needed to enable network users to adjust their own positions and buy or sell flexible gas for balancing purposes. The criteria shall minimise response times by allowing network users to adjust their balance position during the gas day up to a specified time in accordance with other legal obligations. The network code on gas balancing shall prevent TSOs from requiring that network users nominate input volumes which match their output volumes or vice versa.

Specific Assumptions

No specific assumptions have been made in preparing this section.

Development of the Concept

Here we examine some of the key features of the framework guidelines requirements:

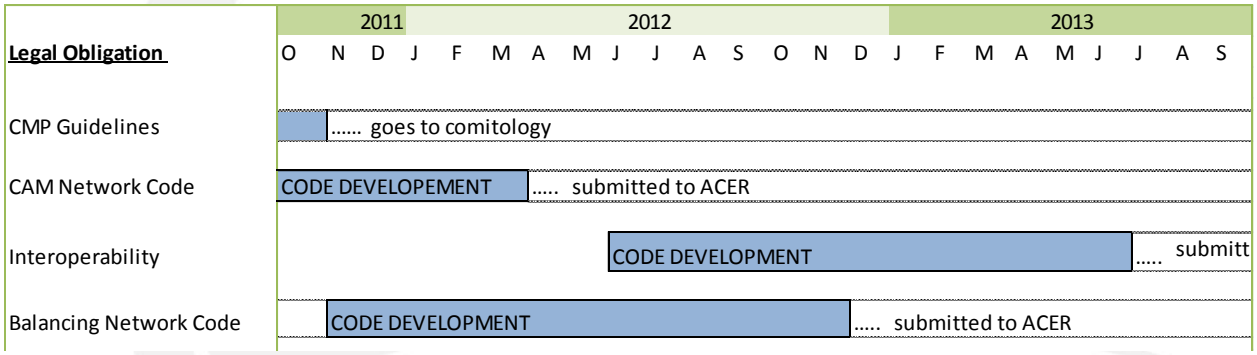
(i) If not covered by other legal obligations;

ENTSOG have identified the following areas that are expected to have a legal impact on nominations:

- The ***CAM Network Code***[7] is expected to provide that 'adjacent transmission system operators shall establish a joint nomination procedure for Bundled Capacity, providing network users with the means to nominate the flows of their Bundled Capacity via a single nomination'.
- ENTSOG understands that the ***CMP Guidelines***[8] may restrict re-nomination rights against certain capacity products at congested interconnection points, from a defined date.
- The draft framework guidelines[9] on ***Interoperability*** require harmonised nomination and re-nomination process processes to be implemented at all interface points across Europe.

Following on from the CAM Network Code and the CMP Guidelines, the Balancing Network Code should define the high-level principles for nominations / re-nominations procedures developed by TSOs. Interoperability will then deal with the operational implementation of these rules in terms of defining any technical parameters, including units and the timing of certain provisions?

ENTSOGs' latest understanding of the timing of the delivery of these documents by ENTSOG to ACER (except CMP guidelines which will go from EC to comitology procedure) is illustrated below.



Based on the above timings, ENTSOG's view is that the code should be developed in the following manner: be compliant with expected provisions of CAM and CMP, while working closely with Interoperability developments when preparing the code, ultimately however the interoperability code development team will have to ensure their proposals are consistent with CMP guidelines, CAM and balancing and provide the necessary details to ensure that the codes adequately complement each other.

[7] Draft CAM network code released 21 June 2011
[8] EC currently developing final guidelines for comitology.
[9] Published on ACER website version 28 October2011

(ii) criteria for nomination and re-nomination procedures to be harmonised at both sides of the border at interconnection points (IPs) and consistently across Europe

It is apparent from the above that detailed procedures for nominations are not required rather 'criteria' for consideration in developing the procedures. These criteria for nomination and re-nomination procedures will concentrate on specifying the principles of what the procedures must contain as a means of ensuring they are consistently used at IPs across Europe.

As mentioned earlier Interoperability is expected to deal with the operational implementation of these rules in terms of defining any technical parameters, including units and the timing of certain provisions.

ENTSOG have identified some principles that might be considered to be important to ensure that the balancing regime envisaged in the framework guidelines functions correctly:

- Network users are able to adjust their gas positions at interconnection points to facilitate portfolio balancing and if necessary within-day obligations (incentives);
- Network users are able to adjust their position through buying and selling gas;
- TSOs shall minimise response times;
- TSOs may not require that network users nominate input volumes which match their output volumes or vice versa;
- The TSO is provided with adequate information to allow it plan its operation in a safe and secure manner;

In terms of delivering the above characteristics into a practical solution, the following may need to considered:

- Network user ability to nominate ahead of the balancing period;
- Network user ability to renominate, both day-ahead and within-day;
- The extent to which an approval / rejection process is maintained by the TSO;
- A confirmation process to confirm nominations have been accepted or rejected;
- Single nomination under a bundled capacity regime;
- Matching process, particularly when set against the above point.

(iii) The application area

The framework guidelines state the criteria for nomination and re-nomination procedures are to be prepared for interconnection points, between balancing zones. As balancing applies to the wider system any rules that will apply for IPs need to be sensed checked against those in place (or to be developed by TSOs) for the wider system to ensure that the balancing rules as an overall package are effective and efficient.

Considerations for Network Code

In developing the Network code ENTSOG will be considering:

- The exact nomination and re-nomination criteria to apply to the procedures developed by TSOs at interconnection points.
- Ensure the criteria complements any system wide rules that may be currently utilised by TSOs or may be required going forward.
- Consideration of how nominations interact with delivery of balancing services (for example TSO might require an increased nomination in respect of delivery of locational gas).
- Interaction with other working areas, such CAM , CMP and interoperability

13 Cross-border cooperation

Introduction of the concept

Currently, there are a number of balancing zones across Europe, including within individual Member States. There are a number of reasons for the current structure and size of these balancing zones, including technical ones such as separate ownership, historical development of the systems, lack of physical interconnection between zones or gas quality differences (such as between low calorific and high calorific gas). Different zones might also be the result of different TSOs operating the network in different areas.

During the last couple of years there have been significant developments seeking to improve integration of gas markets within Europe and in some places a high level of integration is already in place.

Framework Guidelines

The framework guidelines indicate that the network code on gas balancing shall require relevant TSOs to continue to cooperate in order to integrate European gas markets by merging entry and exit zones or create cross-border balancing zones wherever this is technically feasible and economically reasonable or through other means such as market coupling. The relevant TSOs shall consult stakeholders on proposals to integrate European gas markets, including an impact assessment of the expected costs and benefits and on the timeline for completion. ENTSOG shall share the results of the stakeholder consultations with the relevant NRAs and ACER. The final proposal shall be submitted for approval to the relevant NRAs and for information to ACER. The involved NRAs shall coordinate to reach the best outcome possible when providing a decision on this proposal. The NRAs may seek an opinion or a recommendation from ACER, based on the provisions of the Agency Regulation.

ENTSOG are required to regularly review the progress of harmonisation of rules in adjacent balancing zones in order to identify opportunities for the creation of cross-border balancing zones and market coupling.

The framework guidelines also state that TSOs are required to cooperate in merging entry and exit zones to create cross-border balancing zones when it is reasonable from a technical and economic point of view. This signifies that the cross-border arrangements in the network code shall be based not only on the results of a public consultation, but should also include a cost/benefit impact assessment of the options for cross-border balancing. Stakeholders are therefore to be consulted on specific proposals both before and after the Network Code development on the best practise on how to integrate national gas markets. The results of the consultation process will be shared with the National Regulatory Authorities and ACER in order to inform the coordination between NRAs and a possible recommendation by ACER, based on the provisions of the Agency regulation.

Finally, European regional initiatives are considered as a platform to bring forward cross-border balancing cooperation, and the NC´s requirements shall not prevent TSOs in any of the gas regions from bringing forward or consulting on proposals of cross-border projects.

Specific Assumptions

It is assumed that the Network Code provides general guidelines on merging of balancing zones and market integration mechanisms (ENTSOG prefers the use of market "integration" to "coupling" to avoid confusion with electricity regime precedents) and specific projects will be proposed and consulted upon by TSOs.

Development of the concept

The cross border section in the framework guidelines contains two broad elements. Firstly a procedure is explained on how TSOs can cooperate to integrate markets through merging zones, creating cross-border balancing zones or though market integration. . The second element is that the network code shall include a framework for TSOs to implement cross border projects.

Procedure for Cross Border Cooperation

It is clear that all market participants will be involved in this process in the future and any proposal needs to be approved by the relevant NRAs. ENTSOG has the following comments to make on how the procedure described in the framework guidelines will be developed:

- The review to be conducted by ENTSOG has to be worked out in more detail. For example specifying what the preconditions for successful cooperation are, the level of harmonisation required in adjacent balancing zones to implement such cooperation and the possible additional measures required to promote harmonisation.
- The role of NRAs and ACER should be described in more detail; criteria and preconditions identified might then also be applied by NRAs and ACER to get a transparent and clear procedure that limits uncertainty where possible.
- Stakeholders will be participating actively on the development of the proposals, following the requirements on stakeholder involvement as applied in the individual Member State.

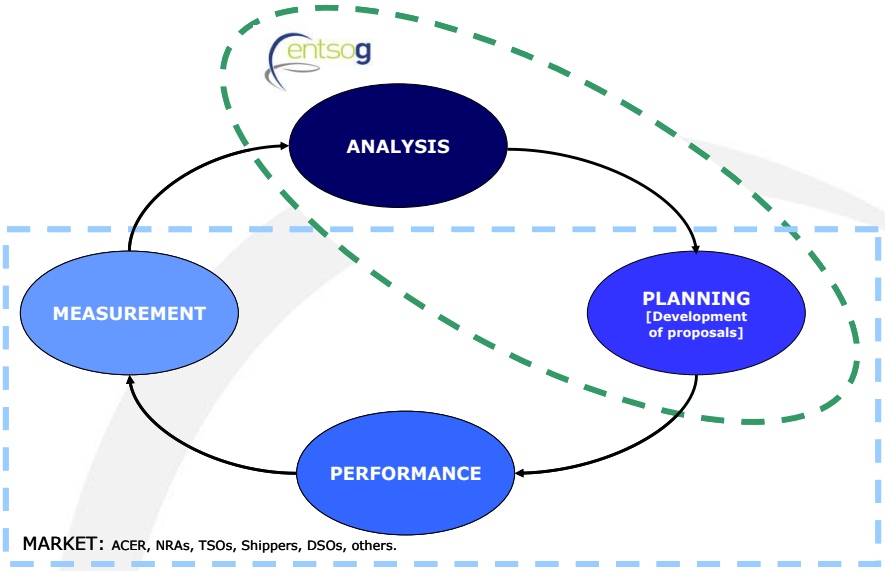
ENTSOG Review

The balancing framework guidelines state: *"The network code on gas balancing shall require ENTSOG to regularly review the progress of harmonisation of rules in adjacent balancing zones in order to identify opportunities for the creation of cross-border balancing zones and market coupling. The review will also consider whether there are additional measures needed to harmonise rules, which may facilitate the achievement of cross-border balancing zones."*

The process of monitoring could be based on:

- Effective reviewing of harmonisation of rules in a prudent manner, consistent with standards of performance related to this activity.
- Regular reviewing of any analysis or information provided from different agents/TSOs in each market on potential projects.
- An evaluation of the performance of any non-binding proposals in place or being proposed by TSOs,

The process is illustrated by the following graphic, which includes details of the parties involved:



Cross Border Proposals

In the framework guidelines TSOs are required to include proposals on cross border balancing. Suggested options for consultation by a TSO are:

1) shipper-led cross-border balancing
2) cross-border TSO balancing
3) a joint balancing platform for TSOs.

The overall intention behind these models is to increase flexibility and competition in neighbouring balancing markets.

In practical terms it would be inappropriate for the Network Code to include detailed proposals for such projects. The Network Code shall describe the process by which project proposals shall be developed. As mentioned previously, any process shall include consultation with stakeholders regarding the options for cross-border balancing. This shall include a cost/benefit analysis of the options and a proposed timeline for completion.

Projects can be developed either on a bilateral basis, between two adjacent transmission systems or on a regional level.

With regards to the **Shipper Led Cross Border Portfolio Balancing** the framework guidelines state that this procedure: "Allows network users to net their imbalances between cross-border neighbouring balancing zones; this shall be without prejudice to a fair allocation of balancing costs among network users of interconnected balancing zones." This proposal appears to be confirming the current e-e model, where shippers can move gas from one balancing zone to another based on transmission rights and nominations of cross-border flows.

Cross Border TSO Balancing is a proposal that would allow TSOs to act as intermediaries to facilitate access to flexible gas in neighbouring markets for example by allowing their neighbouring TSOs to accept bids and offers for balancing services in the balancing zone. The model is based on unused capacity held by both network users (they need to have the right to make renominations) and therefore congested markets could require some sort of consideration with the use of this model.

A ***Joint Balancing Platform*** for TSOs in neighbouring balancing zones to buy and sell gas, where sufficient interconnection exists is the third model presented. The model is based on unused capacity and distinguishes itself from the other two models by creating a whole new platform rather than adjusting two zones towards each other.

Considerations of the Network Code

In developing the network code ENTSOG will have to consider:

- Examine the responsibilities that have been set out in the framework guidelines.
- Identify the scenario and high level criteria required to promote a cross – border integration project.
- Examine the proposals for cross-border projects in the framework guidelines and any other appropriate models that could be used
- Consider a review process for ENTSOG to monitoring harmonisation.

14 Incentives

Introduction to concept

Incentives are used to encourage certain behaviour by either the TSO or the network user. They have a key role to play in driving innovation and positive change.

The framework guidelines

There are three specific incentives provided for in the gas balancing framework guidelines:

(i) The network code on gas balancing shall require TSOs to maximise the amount of their gas balancing needs to be fulfilled through the buying and selling of short-term standardised products on the wholesale market (or, where the wholesale market is not sufficiently liquid, on the balancing platform). NRAs may design incentive mechanisms to encourage TSOs' compliance with this requirement.

(ii) The network code on gas balancing shall require TSOs to procure flexible gas and related balancing services in a way that helps minimise the cost of balancing the system. NRAs may incentivise TSOs to procure efficiently by allowing them to receive a payment if balancing costs are minimised.

(iii) The network code on gas balancing shall require that within-day obligations (incentives) shall not act as an undue barrier to new network users entering the market. Where such obligations apply, TSOs may impose on network users a charge for failing to meet the obligations.

Specific assumptions

The design of the first two incentives has been tasked to the NRA's. The third incentive which is on network users does not contain a duty upon the NRA other than to approve the use of the specific within-day obligation (incentive).

However as there is not a definitive list of within-day obligations (incentives) envisaged it does not seem possible to design a specific harmonised incentive mechanism, although it is likely that incentives will need to be developed for each type of system and the network code might be expected to define the basis for such schemes.

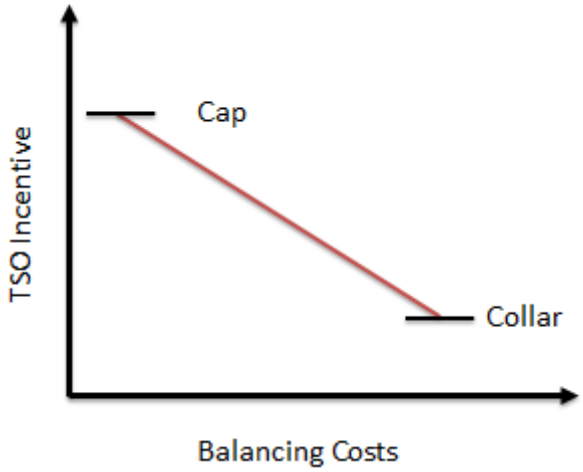
Development of the concept

Given that it is the responsibility of the individual NRA to approve any incentives or within-day obligations (incentives) proposed by a TSO, it is envisaged that the Network Code ultimately may only provide guidance on the principles that could be considered when designing an incentive and the work in preparing the network code will provide examples of the types of incentives that the TSO may wish to pursue in order to facilitate an efficient and economic balancing regime.

Initial thoughts on the principles for incentive mechanisms on the TSO are as follows:

- Different incentive structures can be put in place and should reflect the liquidity of the individual TSOs gas market and their genuine system needs.
- Incentives mechanisms may have an upside and downside and should provide the TSO with an appropriate level of risk and reward. An appropriate level of risk and reward may be best achieved by the use of uncertainty mechanisms or profit caps/loss floors.
- Incentive mechanisms should undergo a periodic review to enable appropriate changes to be made in conjunction with network users and the NRA.

An example of the structure of an incentive mechanism to encourage the TSO to reduce its balancing action costs is shown in the illustration below:



In this example the incentive to the TSO has a direct relationship with the overall balancing costs. A cap and collar are in place. A further feature might be a fixed payment for the TSO if no balancing actions are taking.

Considerations for Network Code

Although the gas balancing framework guidelines do not facilitate specific incentive rules being included in the Network Code, it is expected that a decision will be required on the determination of the key principles the determination of the types of gas balancing incentive mechanisms that could be considered by a TSO/NRA

15 Linepack (Sold as flexibility & trading tool)

Introduction to the Concept

Linepack is the volume of compressed gas stored in the transmission system (on a given day), which may be used to manage the differences in flow rates onto and out of the system. The concept in this section is that it could be sold as a flexibility and trading tool, subject to NRA approval, in accordance with specific criteria.

The framework guidelines

The framework guidelines define linepack as the storage of gas by compression in gas transmission and distribution systems, but not including facilities reserved for TSOs carrying out their functions, as defined in Article 2(15) of Directive 2009/73/EC5 (Gas Directive).

The framework guidelines provision for linepack is as follows:

The network code on gas balancing shall not prevent TSOs from allocating linepack to network users if approved by the relevant NRA. Where linepack is sold, TSOs shall allocate the linepack to network users as a commercial product on a transparent and non-discriminatory basis and it shall be offered at a cost reflective price. The price may also be determined through competitive mechanisms. The decision by the relevant NRA to allocate linepack shall be based on objective criteria, including the physical characteristics of the networks,

whether the provision is consistent with Section 4 of these framework guidelines and whether offering a linepack product would facilitate a more efficient use of the transmission system.

Specific assumptions

This chapter covers the high-level criteria that should be considered by a TSO in developing a linepack service or product for allocating linepack to network users. The calculation methodology for determining the volumes that could be offered for a linepack flexibility service and other technical requirements are out of the scope of the Network Code.

Development of the Concept

The decision by the relevant NRA to allocate linepack shall be based on a list of objective criteria. The following sections cover some initial thoughts of the criteria that should be considered in the development of such a linepack product.

(i) the physical characteristics of the networks

The level of linepack flexibility in transmission systems varies across Europe, where some gas systems have significant amounts while others have low levels. Given that linepack flexibility is normally used to absorb mismatches in flow rates across the system, the calculation methodology developed by the TSO, to determine the amount of linepack to be offered to the market should be based on the technical criteria of the relevant TSOs system and the best information available on the utilisation of that flexibility. It would be envisaged that the TSO should not need to contract any other infrastructure (e.g. storage or terminals) to provide this service, so the extent of linepack flexibility available would be limited to that beyond which otherwise might be used to manage imbalances in flow rates on the system.

(ii) whether the provision is consistent with the framework guidelines sections on network users and TSO roles and responsibilities on Balancing period and nominations

ENTSOG has extracted what it believes are the key features of the balancing framework that the linepack provision must be consistent with:

- Network users shall take primary responsibility for matching their inputs and offtakes through their portfolio balancing activities, for example by means of nominations/re-nominations, from their storage facilities, or exchanges at wholesale markets.
- At the end of the balancing period network users imbalance will be reset to zero;
- The concept of a Balancing period which is 24 hours;
- Criteria for nomination and re-nomination procedures should be set out at both sides of the border at interconnection points and consistently across Europe.
- The impact on the evolution of wholesale markets.

(i) whether offering a linepack product would facilitate a more efficient use of the transmission system.

The following are some initial proposals that might be considered as a more efficient use of the transmission system:

- If offering the service reduces the overall cost of operating the system and the total costs of network users and the TSO, does not place any additional cost on those network users that do not avail of the facility;

Once the linepack service has met the above criteria, its sale as a product must:

a) be a commercial product
b) be sold on a transparent and non-discriminatory basis
c) be offered at a cost reflective price or competitive mechanisms.

Considerations for Network Code

ENTSOG are keen to explore stakeholder views on the following issues in developing a Network Code:

- Determination of the objective criteria (including physical/technical criteria) that could be considered to determine linepack services could be deployed.
- Determination of how the TSO ensures that such a service is transparent and cost reflective.
- The impact on the imbalance calculation (if any);
- Responsibilities of affected parties.

TRANSITIONAL STEPS

The next section examines the interim measures that act as transitional steps towards the Balancing Target model, outlined in earlier sections.

16 Tolerances

Introduction to concept

This section looks at tolerances that can apply as an interim measure on the daily imbalance quantity for network users.

The framework guidelines

The framework guidelines allow tolerances to be introduced as an interim step where network users do not have access to a liquid short-term wholesale gas market or to sources of flexible gas (including the associated infrastructure) to trade in order to be in a position to balance their portfolios. The tolerances shall reflect genuine system flexibility and user needs and address in particular the needs of small users and new entrants. These tolerances may be free of imbalance charges. The rules for the level of tolerances allocated to categories of network users shall be approved by the relevant NRA.

Finally the framework guidelines state that network users shall be financially settled based on their individual imbalance position. After each Balancing Period, each network user's portfolio position will be reset to zero.

Specific assumptions

The tolerances in this section only apply to the end of day imbalance quantity and are not relevant to any charge that may be applied to a network user as a result of a breach of a within-day obligation (incentive). This is a separate concept covered in another section of this document.

Development of the concept

Calculating the tolerance volume

The level of tolerances available for network users should meet the following criteria:

1. Consistency with technical transmission system requirements.
2. Reflection of the level of risk assumed by network users.
3. Useful tool in order to evolve towards the BTM.

4. The tolerance level applied to each network users should not be too small to prevent the management of the network users risk (related to not having access to a liquid short-term wholesale market or to sources of flexible gas) and not too big to not hinder their adaptation to the BTM.

The framework guidelines state that tolerances should not discriminate in particular against network users with smaller gas portfolios. Some potential measures for consideration might include:

- fixed imbalance quantities which provide small network users with a relatively larger tolerance;
- A percentage tolerance which is larger for small users.

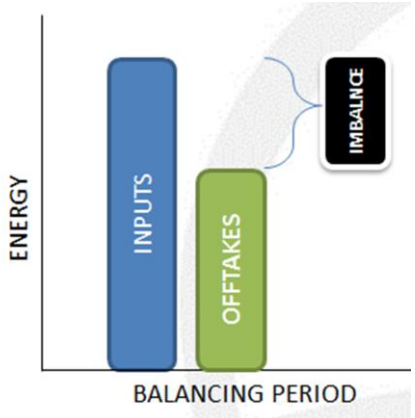
There is a trade off between enabling easy access for new small entrants and common treatment for all network users. Both of the above could be considered discriminatory by many network users.

Treatment of the Tolerance Quantity

Considering the framework guidelines, a tolerance can be defined as a part of the imbalance volume to which a different price can be applied than the marginal price, for example at the average price, i.e. effectively free of charge. This means that the volume within the tolerance can be applied to a different price to the imbalance quantity that would normally be subject to the marginal price.

Example

If we consider a simple example where a network users inputs exceed their offtakes over a balancing period. Normally the difference will be treated as an under delivery, meaning that the network users would buy the shortfall off the TSO at the marginal buy price (i.e. dearer than the average price).



If a tolerance regime applies then the price for the imbalance quantity is treated differently considering the imbalance below the tolerance and the imbalance which exceeds the agreed tolerance.

Network users will settle some or all of the imbalance gas at a more favorable price than the marginal price. e.g. the average price. This will require a definition of a threshold and the way to calculate it. Alternatively a multiplier can be applied to the price to strengthen the signal somewhat. A further variation might include

different multipliers for different tranches of the imbalance quantity. This might mean a portion of the imbalance quantity is settled at the average price while the remaining imbalance quantity is settled at a price closer to the defined marginal prices. The incentive properties of these arrangements need careful consideration.

Considerations for the Network Code

In preparing a section on the Network Code on tolerances several decisions will have to be made:

- Determination of the rules for tolerances (including how the level(s) / threshold is (are) defined and the prices to be applied) and whether different rules could apply to different categories of network users, especially new entrants or small users.
- The framework guidelines provide for tolerances where network users do not have access to a liquid short term wholesale gas market or to sources of flexible gas. The Network Code shall determine the criteria for the use of tolerances. TSOs that comply with these criteria can then discuss the use of tolerances, as an interim measure with the relevant NRA. While this is not expected to be the case it may be in the early years.

17 Imbalance Price Proxy

Introduction to concept

The balancing target model envisages an imbalance price based on the TSO balancing costs from purchasing/selling in the wholesale market, which provides the incentive for network users to balance their inputs and offtakes over the balancing period. However in the early stages of the development of this model there may not be enough liquidity in the wholesale market to fulfill this requirement. In this case an imbalance price proxy can be used, for example the imbalance price can be set using a neighboring markets price for or based on another measure such as a flexibility contract the TSO is a party to. This proxy price should incentivise the same behaviours of the network user that the enduring imbalance price calculation is expected to do.

The framework guidelines

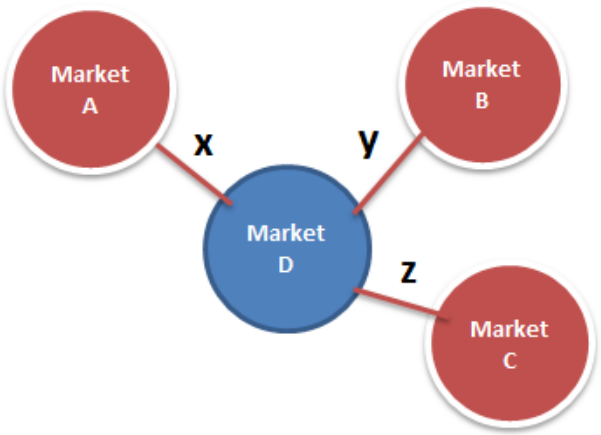
Where, because of insufficient liquidity in the wholesale market or balancing platform, the imbalance charge may be based on an administered price or a proxy for a market price. This proxy may be based on the prices in different wholesale gas markets. The imbalance charge may then include a small uplift or reduction in order to incentivise network users to balance their portfolios. This charge should not deter new market entry and must be approved by the relevant NRA to ensure that it still provides an appropriate incentive for the network user to balance its portfolio.

Specific assumptions

No specific assumptions have been made on this issue as of yet.

Development of the concept

The illustration below is shown to stimulate ideas on what an imbalance price proxy might look like.



If we assume Market D does not have a liquid market, but the three connecting market do. There are several examples of how a proxy maybe set.

Example 1: Simple Average Calculation

Market D price = (A + B + C) /3

Example 2: Weighted Average Calculation

As per example 1, except this time the flows are weighted based on the volumes of gas being imported from each market. So if 90% of the gas came from Market A and 10% from Market B and none from Market C then:

Market D price = (A *90%) + (B*10%) + (C*0%).

Further consideration would then be required on how to treat exports, i.e. should they be netted off?

Example 3: Bespoke Calculation

In this example the price is based on an bespoke formula.

For example: choose the highest market buy price from each of the markets each day and the lowest for sell price. Variants are possible – for example if there are four proxy markets then choose the second highest / lowest.

Example 4:

Examples where price based on something else entirely – storage contract, etc.

Considerations for Network Code

In preparing a Network Code, ENTSOG believes the following will be the key considerations on this matter:

(i) Determination of the exact criteria for using an imbalance price proxy. Insufficient liquidity in the wholesale market and /or balancing platform is one criterion but also if there are any other circumstances that need to be considered.

(ii) At what point does one transfer to using the market price within ones balancing zone – will this drive liquidity.

(iii) Determination of the principles for an imbalance price proxy and any related price uplift and reduction.

18 Balancing Platform

Introduction to concept

A balancing platform is a trading platform on which flexible gas is bought and sold, balancing services are procured and the TSO is party to every trade. A balancing platform is typically set up in the absence of a liquid wholesale market and can act as a bridge from having no short term market to the development of one.

The framework guidelines

The framework guidelines provide for TSOs to procure flexible gas on a balancing platform where a wholesale market is insufficiently liquid (or temporal and locational products cannot be procured on the wholesale market). The framework guidelines require that the network code shall set out criteria on the design of a balancing platform.

Specific assumptions

No assumptions were made in preparing this section.

Development of the concept

ENTSOG have prepared some potential criteria that might be used when developing a balancing platform:

Criteria	Commentary
Transparent	The operation of the platform is carried out in a transparent manner.
Non-discriminatory	The TSO does not discriminate against users of the platform.
Minimum participant requirements	Set out requirements that a party must satisfy before being able to trade, as specified by the respective TSO
Balancing products to be consistent with Network Code	This will help move towards the balancing target model.
Bid-offer based mechanism	The TSO accepts the lowest offer when buying gas and highest bid when selling gas.
Moving from balancing platform to wholesale market	Criteria for how the move from a balancing platform to a wholesale market will be assessed.
Cross Border examination	The TSO should consider the possibility of a cross border balancing platform.

Considerations for Network Code

The network code development will need to address the design of a balancing platform and examine how it interfaces with the TSO systems.

19 Flexible Gas Release Programme

Introduction to concept

It is recognised that in order to establish a competitive gas market all network users need to have fair and economic access to customers, transmission networks, gas supplies and flexibility services. In line with this principle, ACER proposed that where bilateral long-term contracts for the option to utilise balancing services are in place, the network code should introduce arrangements for the TSOs to release back to the market any gas, it does not require for balancing purposes and reduce the volumes contained in these contracts.

The framework guidelines

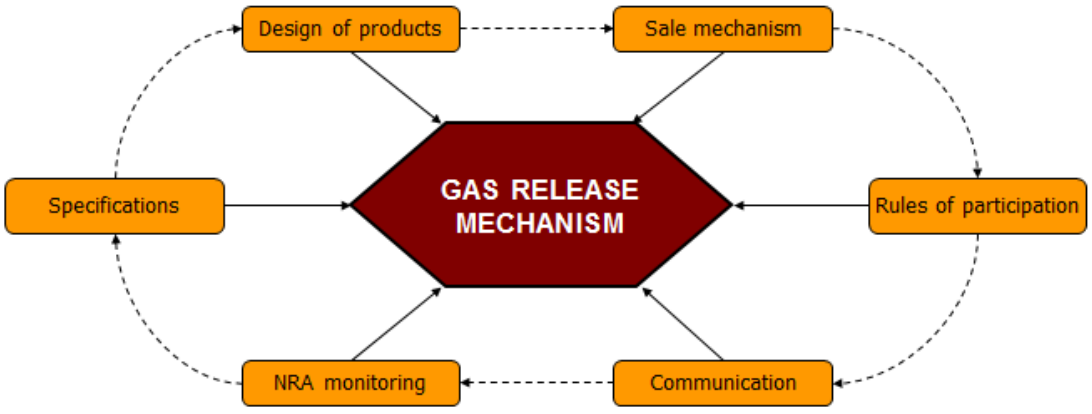
Where long term contracts for the procurement of flexible gas are already in place and provide TSOs with an option to take specific volumes of flexible gas, the network code on gas balancing shall provide for the volumes of flexible gas covered by the option to be reduced. The network code on gas balancing shall include arrangements for TSOs or the undertaking holding the flexible gas to release back to the market any surplus gas which is not required for balancing purposes in any given balancing period, in order that network users have access to greater volumes of flexible gas. The relevant NRA(s) may set targets regarding the proportion by which these long term contracts should be reduced. This interim step can increase liquidity in short term gas markets.

Specific assumptions

No specific assumptions have been made in preparing this section. Development of the concept

Development of the concept

The illustration below is intended to demonstrate some of the possible concepts of a flexible gas release mechanism:



Some considerations/criteria of this mechanism would be:

- The gas release mechanism should be based on transparent and non-discriminatory criteria;
- The duration of the mechanism will consider the duration of the length of the flexibility contract;
- The treatment of capacity pertaining to the flexible gas;
- TSO may offer the gas released jointly with transportation capacity. In this case, the gas release mechanism may have to be coordinated with third party access procedures;
- TSO may have an option to offer flexible gas both on a firm and interruptible basis, taking into account technical criteria and the best information available about forecast demand;
- The programme would need to consider the flexibility that is available in the nomination / re-nomination process;
- The released gas should be freely tradable on the wholesale market.
- Rules of settlement: based on the best market practices.

Considerations for Network Code

Some of the considerations when developing the network code will be:

- High level criteria;
- Requirements and specifications of the process;
- Find methodology to determine what surplus gas is available;
- Sale mechanisms;
- Responsibilities;

20 Glossary (Working Document)

ENTSOG have compiled a list of definitions from relevant documents as a reference for stakeholders. The definitions are intended to be used as a working document only – i.e. new definitions may not be appropriate in a balancing context and new definitions will be required. We expect that a common cross code definition register may be required.

Term	Description	Source	Info	CF
Balancing Period	means the period within which the off-take of an amount of natural gas, expressed in units of energy, must be offset by every network user by means of the injection of the same amount of natural gas into the transmission network in accordance with the transport contract or the network code	Regulation 715	y	y
Balancing period	a standardised daily interval, at the end of which network users are financially settled for any deviations, as accumulated over the course of the preceding 24 hours, between their inputs into and off-takes from the balancing zone. In the network code this standardisation shall be set out from 5:00 to 5:00 UTC/GMT or any other time period harmonised across the EU as decided for daily capacity products in the network code on Capacity Allocation Mechanisms. (From Section 4.1 and not Definitions Section)	Balancing Framework guidelines		y
Balancing Platform	a trading platform on which flexible gas is bought and sold, balancing services are procured and the TSO is party to every trade	Balancing Framework guidelines	y	y
Balancing Regime	the rules and agreements that apply to portfolio and TSO balancing, including the procurement of flexible gas, balancing services and imbalance charges.	Balancing Framework guidelines	y	y
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.	Balancing Framework guidelines		y
Balancing Zone	An entry-exit system, which may consist of more than one system, as defined in Article 2(13) of the Gas Directive, to which a specific balancing regime is applicable. Distribution systems may be part of the balancing zone. The entries from storage and LNG into the transmission system as well as the exits from the transmission system into the storage are part of the balancing zone.	Balancing Framework guidelines	y	y
Comitology Procedure	means the procedure according to article 5a (1) to (4) and article 7 of Council Decision 1999/468/EC of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission, OJ 1999 L 184/23.	Draft CAM Network Code	y	
Customer	means a wholesale or final customer of natural gas or a natural gas undertaking which purchases natural gas;	DIRECTIVE 2009/73/EC	y	y

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Distribution System Operator	means a natural or legal person who carries out the function of distribution and is responsible for operating, ensuring the maintenance of, and, if necessary, developing the distribution system in a given area and, where applicable, its interconnections with other systems, and for ensuring the long-term ability of the system to meet reasonable demands for the distribution of gas;	DIRECTIVE 2009/73/EC	y	
Eligible Customer	means a customer who is free to purchase gas from the supplier of his choice, within the meaning of Article 37;	DIRECTIVE 2009/73/EC		
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.	Balancing Framework guidelines		y
Framework Guideline	means the ERGEG Revised Pilot Framework Guideline on Capacity Allocation Mechanisms dated 7 December 2010.	Draft CAM Network Code	y	y
Gas Day	means the period from 5:00 to 5:00 UTC for winter time and from 6:00 to 6:00 UTC when daylight saving is applied.	Draft CAM Network Code	y	y
Imbalance	the situation in which individual network users' injections into the balancing zone differ from their off-takes from the balancing zone or in which aggregate inputs to the system differ from aggregate off-takes from the system in a balancing period. This may result in either individual network users and/or the TSO buying or selling gas (or the TSO buying balancing services) in order to offset the imbalance. Inputs into and off-takes from the balancing zone can take the form of either physical gas at a specific point or gas exchanged at a virtual point in the market.	Balancing Framework guidelines	y	y
Imbalance Charge	the storage of gas by compression in gas transmission and distribution systems, but not including facilities reserved for TSOs carrying out their functions, as defined in Article 2(15) of the Gas Directive.	Balancing Framework guidelines	y	y
Interconnection Point	means a cross-border interconnection point, whether it is physical or virtual, between two or more Member States as well as interconnection between adjacent entry-exit-systems within the same Member States, in so far as these points are subject to booking procedures by network users.	Draft CAM Network Code	y	y
Linepack	the storage of gas by compression in gas transmission and distribution systems, but not including facilities reserved for TSOs carrying out their functions, as defined in Article 2(15) of the Gas Directive.	Balancing Framework guidelines		y
Linepack	means the storage of gas by compression in gas transmission and distribution systems, but not including facilities reserved for transmission system operators carrying out their functions;	DIRECTIVE 2009/73/EC		y
Liquidity	the ability to quickly buy or sell reasonable volumes of gas without causing a significant change in price and without incurring significant transaction costs. A key feature of a liquid market is that it has a large number of buyers and sellers willing to transact at all times. The assessment of market liquidity shall include a consideration of the volumes traded, churn rates and the number of players on the market.	Balancing Framework guidelines		y

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Liquidity	Local balancing – the actions undertaken by the TSOs addressing imbalances at particular locations within the system.	Balancing Framework guidelines		y
LNG Facility	means a terminal which is used for the liquefaction of natural gas or the importation, offloading, and re-gasification of LNG, and includes ancillary services and temporary storage necessary for the re-gasification process and subsequent delivery to the transmission system, but does not include any part of LNG terminals used for storage;	DIRECTIVE 2009/73/EC		y
Locational Product	Flexible gas products traded for delivery only at specified locations within the balancing zone.	Balancing Framework guidelines		y
Marginal Sell Price	a price based on the lower of: the lowest price of any gas balancing trading to which the TSO is a party in respect of the balancing period (excluding locational or temporal products); and the weighted average price of gas traded in respect of that day. (This price may include a small adjustment to incentivise network users to balance).	Balancing Framework guidelines		y
Minimum Amount of Capacity	means the minimum amount for a Standard Capacity Product which the network user is willing to be allocated.	Draft CAM Network Code		
Network Code	means this Network Code on Capacity Allocation Mechanisms pursuant to article 8 (6) lit g) of Regulation (EC) 715/2009.	Draft CAM Network Code	y	y
Network User	means a customer or a potential customer of a transmission system operator, and transmission system operators themselves in so far as it is necessary for them to carry out their functions in relation to transmission	Regulation 715	y	y
Network User	a party that uses the transmission system to transport gas from one location to another or to trade gas at the virtual trading point.	Balancing Framework guidelines	y	y
Nomination	means the prior reporting by the network user to the transmission system operator of the actual flow that the network user wishes to inject into or withdraw from the system	Regulation 715	y	y
Portfolio Balancing	the actions undertaken by network users in order to help ensure that their off-takes from a balancing zone match their inputs onto the same balancing zone over the duration of the relevant balancing period.	Balancing Framework guidelines		y
Re-Nomination	means the subsequent reporting of a corrected nomination	Regulation 715	y	y
System	means any transmission networks, distribution networks, LNG facilities and/or storage facilities owned and/or operated by a natural gas undertaking, including linepack and its facilities supplying ancillary services and those of related undertakings necessary for providing access to transmission, distribution and LNG;	DIRECTIVE 2009/73/EC	y	y
System User	means a natural or legal person supplying to, or being supplied by, the system;	DIRECTIVE 2009/73/EC		y
Temporal Product	flexible gas product traded for delivery during a certain time period within the balancing period	Balancing Framework		y

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		guidelines		
Transmission system	a high pressure transmission network consisting of terminals, compressor stations, pipeline systems and off-take points. For the purposes of these Framework guidelines, Liquefied Natural Gas (LNG) and storage facilities are not included in the transmission system.	Balancing Framework guidelines	y	
Transmission system operator	means a natural or legal person who carries out the function of transmission and is responsible for operating, ensuring the maintenance of, and, if necessary, developing the transmission system in a given area and, where applicable, its interconnections with other systems, and for ensuring the long-term ability of the system to meet reasonable demands for the transport of gas;	DIRECTIVE 2009/73/EC	y	y
TSO balancing	the actions undertaken by the TSO to ensure that the system stays within its accepted operational limits6.	Balancing Framework guidelines	y	y
Wholesale Market	a physical or virtual point at which network users trade gas with each other either bilaterally, or via an exchange. The TSO can also trade in this market for balancing purposes. A range of products can be traded including: financial/virtual, physical (where the gas is required to be delivered at a certain point) and temporal (where the gas is required to be delivered during a certain time period within the gas day).	Balancing Framework guidelines	y	y
Within-Day	means daily capacity offered and allocated during the relevant Gas Day, or within the relevant period preceding the relevant Gas Day.	Draft CAM Network Code		y

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