Consultation Document

Regarding Implementation Proposals for Balancing-Related Issues

Based on the Draft

Network Code on Gas Balancing in Transmission Systems

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1 Introduction

The Regulation establishing a Network Code on Gas Balancing of Transmission Networks (hereinafter NC BAL) is expected to become effective in April 2014. NC BAL is presently being reviewed by the European Parliament and the European Council prior to the regulation's publishing in the Official Journal of the European Union and its entry into force twenty days after publication. The regulation is intended, among other goals, to achieve harmonisation of the European gas balancing regimes. To this end, NC BAL outlines standards for gas balancing regimes which apply Europe-wide and must be implemented by 01/10/2015, as well as consultation obligations for affected transmission system operators (TSOs) and market area managers (MAMs) which apply in certain circumstances.

In a letter dated 09/12/2013 the German national regulator Bundesnetzagentur (Federal Network Agency) instructed MAMs and TSOs to submit by 03/03/2014 applications, proposals and a recommendation document regarding the introduction of within day obligations in the interest of enabling an efficient and focused NC BAL implementation procedure. Any introduction of within day obligations and any application of interim measures require prior consultation of market participants by the MAMs and TSOs. This document has been prepared by the MAMs and TSOs in fulfilment of their consultation obligations under NC BAL. As an aid, references are made in several places in this consultation document to the German-language version of NC BAL dated 27/11/2013 as agreed in the comitology meeting.

The consultation procedure carried out by the MAMs and TSOs runs from 17/01 - 31/01/2014. The authors will give due regard to the outcome of the consultation and submit a recommendation document to the Federal Network Agency by 03/03/2014.

Following submission of the recommendation document, the Federal Network Agency plans to start an official procedure in April 2014 by issuing a formal notice of commencement requiring market participants to implement NC BAL.

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1 Pursuant to Article 51(1) NC BAL, national regulatory authorities may permit the TSO/MAM in response to a justified request to achieve compliance with the provisions of this regulation by the end of a period of 24 months from 01/10/2014.
The "GABi Gas" system presently in place will continue to apply until the changes pursuant to NC BAL become effective. This applies particularly concerning the hourly incentive mechanism.

This consultation document includes a detailed outline of the planned modified gas balancing regime for the German market areas GASPOOL and NetConnect Germany (NCG) which meets European regulatory requirements. The MAMs and TSOs are conducting the consultation to give stakeholders opportunity to provide reasoned comments and opinions regarding the proposed model.

Pursuant to Article 26(4) NC BAL, the TSOs and MAMs in the two German market areas are obliged to consult the relevant stakeholders before introducing a new within day obligation. Article 46(2) NC BAL also provides that the TSOs and MAMs must consult stakeholders in relation to a report on interim measures to be taken. The TSOs and MAMs propose as an interim measure to maintain the physical balancing platforms in place in the market areas, which is why this consultation document also comprises a report on this measure.

Comments and opinions may be sent via e-mail (info@fnb-gas.de) to the FNB Gas association, which is conducting this consultation on behalf of the TSOs and MAMs. The deadline for submitting consultation responses is 31 January 2014. The consultation participants must designate accordingly any comments/opinions which they do not wish to be published. Please use the attached response sheet, which allows for a methodical analysis of the opinions/comments received.
2 Within day incentive mechanism

Pursuant to Article 24 (1) NC BAL, so-called within day obligations (within day incentives for network users to keep their balancing portfolios in balance) may be established with a view to ensuring the system integrity of a transmission network and minimising the need for balancing actions. The hourly incentive mechanism currently in place (structuring charge) cannot be maintained for this purpose in its presently existing form as it does not meet NC BAL criteria with regard to the courses of action available to balancing group managers (BGMs) and cost-based pricing. As part of a BDEW work programme the TSOs, MAMs and other market participants have thus jointly developed a model for a within day incentive mechanism. The intent was to meet NC BAL requirements and enhance flexibility for the BGMs while retaining the advantages of the present within day incentive mechanism. The model as well as the reasoning supporting a within day incentive mechanism are outlined in more detail in the following.

2.1 Necessity

According to Article 26 (5) (a) NC BAL the necessity of a within day incentive mechanism must be analysed. To this end the TSOs explored and evaluated the impact of running a system with no or only limited within day incentives in various scenarios. It can already be stated at the outset that a system with no within day incentives would require a very large amount of balancing gas and a high degree of flexibility, resulting in very high costs. The availability of balancing products is not expected to be guaranteed at all times. For the reasons stated, within day incentives within the gas balancing regime are considered necessary.

2.1.1 Description of the scenarios analysed

The TSOs have explored and evaluated the impact of running a system with no or only limited within day incentives in various scenarios. The specific scenarios are:

- Scenario 1: no within day incentive mechanism, i.e. balancing groups only have to be balanced at the end of the gas day
- Scenario 2: within day incentive mechanism applying to quantities allocated as Entry, EXITso, SLP (non daily metered), i.e. shippers are free to distribute the inputs used to supply end users equipped with demand-
recording metering equipment (so-called RLM customers) over the day at their own discretion

- Scenario 3: within day incentive mechanism applying to quantities allocated as Entry, EXITso, SLP. Only 50% of the entry capacity booked to supply RLM end users can be used flexibly; 50% of inputs intended for offtake at RLM exit points are distributed freely over the course of the day.

In all scenarios it was assumed that all offtake quantities not subject to within day incentive mechanisms are input as late as possible. The balancing groups are only balanced at the end of the gas day. For the resulting maximum period of zero input nominations and minimum period of maximum input nominations the demand/oversupply of flexible gas for structuring purposes were calculated. These extreme parameters illustrate the maximum utilisation of within day flexibilities possible (largest difference between inputs and offtakes). In all scenarios balancing opportunities provided by the networks and their associated linepack/storage levels (so-called internal balancing gas) are used to level out offtakes which are allocated a flat profile and to compensate for the inertia involved with balancing, thus it could not be additionally used to reduce the need for structuring actions.

The maximum entry capacity was assumed to equal the firm capacity technically available at the entry points, as this capacity is guaranteed to be available to the shippers. The average daily quantity (sum of all actual offtakes at exit points controlled by the TSO, including network connection points, network interconnection points, cross-border interconnection points, market area interconnection points and storage connection points) divided by 24 was used as the offtake quantity. As a result of this approach the quantities are considered in a 'flat' view, which means that within day fluctuations which regularly occur in reality are not taken into account and thus the structuring requirements and quantities determined would actually be even greater. The TSOs involved in the calculation all applied data for the 2011/2012 gas year, separately for the winter and summer periods. The following graphs illustrate the scenarios in detail (using sample figures):

**Scenario 1:**

Figure 1 shows an assumed average offtake of 118 GWh/h. This corresponds to a daily quantity of 2,832 GWh. The entry capacity (technically available capacity) is 197 GWh/h. At full utilisation of the technically available entry capacity it is possible to input
the entire offtakes over the last 15 hours of the gas day. This also applies to quantities the allocation of which is known in advance (case group SLP) or which are under the control of the shippers themselves (case group EXITso). Thus in the example, during the first nine hours no gas is input at all. From a system perspective the short position of the balancing groups during the first nine hours creates an undersupply resulting in a demand for flexible gas (purchases of balancing gas), and an oversupply (sales of balancing gas) in the last 15 hours due to the long position of the balancing groups. Such a behaviour on the part of the balancing group managers cannot be ruled out with certainty. It must be considered that even if shippers behave like this in a single hour or a few hours only, this may suffice to create an extremely high demand for or oversupply of gas which it may not be possible to meet on time using the corresponding balancing products.

Figure 1: Sample Scenario 1

Scenario 2:
In scenario 2, there is only full flexibility for quantities supplied to RLM end users, i.e. quantities allocated as SLP (on a flat basis) and EXITso quantities need to be input at the time and in the amounts corresponding to the time and amount of the relevant offtakes. The daily quantity for RLM end users is input as late as possible, utilising the available entry capacity -- see Figure 2.
Scenario 3:

In scenario 3 (Figure 3) it is assumed that only a maximum of 50% of the entry capacity booked for the delivery of gas to RLM end users can be used flexibly (continuous production, restrictions in purchase and supply contracts, balancing group managers do not act simultaneously and identically, restrictions on storage characteristics). 50% of the RLM quantities are input at the time and in the amounts corresponding to the time and amount of the relevant offtakes. Quantities allocated as SLP (on an even, 'flat' basis) and EXITso are also input at the time and in the amounts corresponding to the time and amount of the relevant offtakes.
2.1.2 Result of the scenario analysis

The calculations underlying scenario 1 show that a very high balancing gas demand can result, involving great cost. Physical availability of balancing products offering the capacity and flexibility required is highly unlikely. On the other hand, network instability would result if the imbalance were not balanced within a very short period of time.

Given that the quantities allocated as EXITso and SLP offtakes are known to the balancing group managers prior to their submitting input nominations, there is no reason to suspect that balancing group managers might not continue inputting these quantities at the time and in the amounts corresponding to the time and amount of the relevant offtakes. Scenario 1 was thus not given further consideration. Scenarios 2 and 3 however were further evaluated in financial terms, in consultation with market participants. For each TSO’s network analysed, the required hourly and overall flexible gas quantities (balancing gas which needs to be procured from shippers, so-called external balancing gas) were priced alternatively applying storage costs, the balancing gas price spread and the costs involved with flexible balancing products. The additional balancing costs resulting from this calculation are shown in summarised form in Table 1 below.
Table 1: Overview of additional balancing energy costs for a gas fiscal year

<table>
<thead>
<tr>
<th>Additional balancing energy costs</th>
<th>Scenario 2</th>
<th>Scenario 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage costs</td>
<td>€ 3,602 million/a</td>
<td>1,801 million/a</td>
</tr>
<tr>
<td>• Filling</td>
<td>1,776 million/a</td>
<td>888 million/a</td>
</tr>
<tr>
<td>• Withdrawal</td>
<td>284 million/a</td>
<td>142 million/a</td>
</tr>
<tr>
<td>• AGV</td>
<td>1,542 million/a</td>
<td>771 million/a</td>
</tr>
<tr>
<td>Flexibility product</td>
<td>3,312 Mio. million/a</td>
<td>1,760 million/a</td>
</tr>
</tbody>
</table>

Balancing energy price spread

<table>
<thead>
<tr>
<th></th>
<th>Scenario 2</th>
<th>Scenario 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>• NCG global</td>
<td>581 million/a</td>
<td>291 million/a</td>
</tr>
<tr>
<td>• NCG quality</td>
<td>830 million/a</td>
<td>415 million/a</td>
</tr>
<tr>
<td>• GP Commodity H-Gas</td>
<td>824 million/a</td>
<td>412 million/a</td>
</tr>
<tr>
<td>• GP Commodity L-Gas</td>
<td>1,159 million/a</td>
<td>580 million/a</td>
</tr>
</tbody>
</table>

It must be noted that price assumptions are subject to great uncertainty. Given an extreme increase in the (within day) balancing gas requirements, a much wider balancing gas price spread is likely. Furthermore, the past has shown that the balancing gas quantities to be procured from shippers cannot by any means be fully covered by global balancing gas call orders. Accordingly, the scenarios reflect alternative best-case calculations.

From a network standpoint within day balancing group management incentives are necessary, as a lack of such incentive mechanisms requires maintaining a disproportionately high level of flexibility, which increases cost. Due to the lead time for call orders requesting balancing gas from shippers, additional within day structuring products must be purchased to avoid the risk of short-term disruptions in the gas supply due to unavailability of balancing gas. At present the availability of balancing gas in the volumes calculated is not ensured.

It must be noted that all examinable approaches are of a theoretical nature. The actual behaviour of balancing group managers under a balancing model providing no within day incentives or only minimal within day incentives cannot be reliably predicted. Full use of the flexibilities provided cannot be definitively ruled out either however. It must also be mentioned that the more flexibilities are made available domestically to the balancing group managers, the more they can use these flexibilities to offer flexibility services in neighbouring countries. The costs incurred for flexible gas used to structure gas flows in a neighbouring country would then be borne by the balancing group.
managers in Germany. It can additionally be assumed that intra-day trading will increase, which would further increase utilisation of flexibilities in the network.

The GABi Gas model currently in use meets the core requirements for a functioning gas market – ensuring network stability and security of supply, and meeting external balancing gas requirements.

2.2 Description of the target model

Under the within day incentive mechanism, the sum of all physical and virtual inputs is netted against the sum of all physical and virtual offtakes for every hour of the gas day. Any remaining hourly differences occurring during the gas day are added together. If the accumulated hourly differences exceed a so-called ‘daily tolerance’ level, the amount exceeding the tolerance level is defined as the quantity relevant for billing purposes. A flexibility fee is charged on this basis, which is discussed in greater detail further below in this document. The relevant quantity is calculated on an hourly basis.

The following case groups are defined for the purposes of the within day incentive mechanism:

**Group 1**

- Entry and exit points on borders with other countries
- Entry and exit points on borders with other market areas
- Entry and exit points to/from storage facilities
- Entry points from domestic production facilities
- Virtual entry and exit points (VTP)
- Exit points to end users where gas flows are controlled by any procedure substituting the usual nomination procedure

For these points the quantities allocated for each hour as accounted for in the balancing group are included in the within day calculation. Tolerances do not apply for these quantities on a within day basis.

**Group 2**

- Exit points to RLM end users
For all RLM exit points the measured quantities ("allocated as measured") are allocated and considered in the hourly analysis. Thus the currently used distinction between RLM exit points according to whether a flat or a structured profile is allocated will no longer be necessary. A tolerance of +/- 7.5% is granted ex-post on the allocated daily quantity for Group 2.

**Group 3**

- Exit points to SLP end users

For SLP exit points, the hourly share of the daily quantity as results from the application of the relevant standardised load profile in the demand estimation procedure and distributed evenly over the gas day is relevant for the within day incentive scheme ("flat profile"). Tolerances do not apply for these quantities on a within day basis.

The example below and Figure 4 illustrate the proposed system:
Figure 4: Sample methodology for within day incentive mechanism

<table>
<thead>
<tr>
<th>Hour</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
<th>21</th>
<th>22</th>
<th>23</th>
<th>24</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entry allocation</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
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<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>240</td>
<td></td>
</tr>
<tr>
<td>Exit allocation</td>
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<td>2</td>
<td>5</td>
<td>25</td>
<td>25</td>
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<td>5</td>
<td>10</td>
<td>15</td>
<td>240</td>
<td></td>
</tr>
<tr>
<td>Difference</td>
<td>10</td>
<td>8</td>
<td>5</td>
<td>-15</td>
<td>-15</td>
<td>-15</td>
<td>15</td>
<td>7</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td>-5</td>
<td>5</td>
<td>0</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Aggregated difference</td>
<td>10</td>
<td>10</td>
<td>23</td>
<td>8</td>
<td>-7</td>
<td>-22</td>
<td>-17</td>
<td>-10</td>
<td>-5</td>
<td>0</td>
<td>0</td>
<td>-5</td>
<td>0</td>
<td>0</td>
<td>-5</td>
<td>-10</td>
<td>-15</td>
<td>-15</td>
<td>-15</td>
<td>-15</td>
<td>-5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-72</td>
</tr>
<tr>
<td>Exceeding of positive tolerance</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
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<td>0</td>
<td></td>
</tr>
<tr>
<td>Exceeding of negative tolerance</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>
A balancing group comprises entry points falling into Group 1 and RLM exit points (Group 2). The input allocation quantity in the first six hours of the gas day is a constant 10 quantity units (QU) per hour, the offtake allocation quantity varies between 0 and 25 QU. Assuming an RLM daily quantity of 240 QU, the daily tolerance is +/- 18 QU or +/- 7.5%.

The net balance of inputs versus offtakes is calculated hourly and these balances are added cumulatively. The running balance is compared hourly against the granted daily tolerance. In hour 1 the balancing group is long by 10 QU, in hour 2 by 8 QU. The daily tolerance of 18 QU was thus used up completely after the second hour. When the balancing group is again oversupplied in hour 3, the running balance is 23 QU, thus exceeding the granted daily tolerance by 5 QU. From hour 4 the utilised daily tolerance falls due to a short position in the balancing group. The continuous increase in the offtake allocations while the input allocations remain constant means that in hour 6 the daily tolerance is exceeded -4 QU. Assuming the daily tolerance is not exceeded again over the remaining hours of the gas day, the quantity relevant for billing for that day under the within day incentive mechanism is 9 QU.

2.3 Derivation of daily tolerance

The model described in Section 2.2 provides for a daily tolerance of +/- 7.5% to be applied on all offtakes at exit points to RLM end users. This value has been derived based on the GABI Gas regime, which has been applied since 2008.

Figure 5 shows the current tolerance range for the case group RLMmT, i.e. RLM exit points where a flat profile is allocated. The balancing group manager receives an hourly tolerance of +/- 15% on his allocated offtakes. Given a daily quantity of 2,400 QU and an arithmetically derived hourly allocation value of 100 QU, an hourly tolerance results in the amount of +/- 15 QU. Assuming that the balancing group is balanced at the end of the gas day, the balancing group manager could utilise the granted tolerance in one direction for a maximum of 12 hours without having to pay the 'structuring charge' currently applicable. Cumulatively the balancing group manager uses up a tolerance of 180 QU. This corresponds to 7.5% of the daily quantity or an average of 1.8 times the hourly quantity.
As opposed to today’s GABi Gas regime, under the daily tolerance model 180 QUs or +/- 7.5% of the daily quantity can be used up within a single hour. This benefit to the balancing group manager is a still-acceptable risk for the TSOs under the assumption that all balancing group managers do not behave identically at the same time. Sample calculations provided by market participants have shown that at +/- 7.5% daily flexibility, even in a small portfolio (11 customers) no flexibility fees are triggered, even though the inputs are delivered on a flat basis. The sample calculations are provided in the figures below.
Figure 7: Sample customer with a low load factor

Figure 8: Sample customer with a medium load factor

Only portfolios comprising a single customer with a low load factor exceed the tolerance granted, potentially triggering flexibility fees. This is appropriate, as in such case corresponding structuring services are provided for the balancing group manager by the TSO/MAM. The balancing group manager can reduce or even avoid these by means of structuring his inputs.
2.4 Flexibility fee

To maintain system stability and limit the balancing costs associated with guaranteeing a flexibility limit, the TSOs' model description provides for an upper limit to the daily tolerance of +/- 7.5% of the daily quantity allocated to RLM end users. This flexibility is granted to the balancing group manager. Any further flexibility used is priced by the MAM and billed to the balancing group manager.

Whether or not the balancing group manager is charged for the quantities relevant for billing as determined under the within day incentive mechanism depends on whether on that day balancing actions had to be taken in the opposite direction in the same gas quality within the market area. Such a counter-directional balancing action is deemed to be given when balancing gas was both purchased and sold within a market area on a given gas day. When this pre-condition is in evidence, the flexibility fee is calculated by multiplying the quantity relevant for billing, i.e. the quantity exceeding the daily tolerance, by the spread between the prices paid for the counter-directional balancing actions taken. For this purpose, the respective marginal prices for the counter-directional balancing actions are applied.

The example below is provided for illustration purposes.
2.5 Compliance with the criteria set out in Article 26(2) NC BAL

NC BAL provides that a within day incentive mechanism must fulfil the criteria set out in Article 26(2) (a) – (f). As outlined below, the TSOs and MAMs believe that the incentive mechanism described in this document meets the requirements:

(a) A within day obligation and related within day charge, if any, shall not pose any undue barriers on cross-border trade and new network users entering the relevant market.\(^2\)

A within day obligation is intended to motivate network users to show a usage behaviour which is on the whole beneficial to the system. Usage behaviour is beneficial to the system if it results in roughly corresponding inputs and offtakes. Without limitation, this is deemed to be the case in particular if it not only applies in relation to the entire day but also for shorter periods of time (one or a few consecutive hours of

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Table 2: Sample calculation of flexibility fee

<table>
<thead>
<tr>
<th>Balancing gas purchased</th>
<th>Balancing gas sold</th>
<th>Marginal price spread</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 MWh at € 35/MWh</td>
<td>7 MWh at € 25/MWh</td>
<td>€ 10/MWh</td>
</tr>
<tr>
<td>10 MWh at € 30/MWh</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The flexibility fee is € 10/MWh based on the above values.

The determination and billing are carried out ex-post based on the counter-directional balancing actions actually taken. This ex-post approach ensures that the potential charge serves as an incentive for the balancing group managers to manage their balancing groups within the daily tolerance. The ex-post approach also allows using actual costs incurred.

The fact that not every instance of exceeding the tolerance is billed to the balancing group manager represents a major difference versus the within day incentive mechanism presently in place. As long as no counter-directional balancing actions need to be taken, meaning that the TSOs are not required to buy flexible gas to structure gas flows during the day, the balancing group manager can exceed the tolerance limit without incurring additional cost.

All revenue yielded from the billing for the relevant quantities is booked to the balancing neutrality account, thus upholding the principle of revenue neutrality.

\(^2\) Article 26(2) (a) NC BAL
the day). Thus the purpose of having within day obligations is to promote usage behaviour in which the balancing group managers keep inputs and offtakes balanced for as many hours of a day as possible.

The relevant market for cross-border trade is assumed to comprise at least the market areas or entry/exit systems connected at a cross-border interconnection point or market area interconnection point. This is because the intention behind cross-border transports is to trade the transported gas in those submarkets, thus connecting the submarkets to form a larger market. In particular, such arbitrage transactions lead to a convergence of prices on both submarkets.

In the opinion of the parties conducting this consultation, within day obligations and the related charges do not restrict cross-border trade, as the gas quantities transported via cross-border interconnection points and market area interconnection points can be nominated precisely for each hour of the day and are allocated to balancing groups using the "allocated as nominated" procedure. Traders are able to plan, trade and nominate the corresponding gas quantities and have them transported in the relevant market without any balancing risk.

The relevant market for the entry of new network users is assumed to comprise at least one market area or entry/exit system. This is because within each market area, given that there are no hydraulic constraints, end users can be supplied using the gas quantities traded at the respective virtual trading point (VTP). The VTPs in the market areas GASPOOL and NCG as well as other trading points in EU member states bordering Germany are sufficiently liquid to ensure this. Trading volumes and churn rates have been rising for years, reflecting adequate liquidity. Prices have been converging. Every balancing group manager is thus able to supply end users in a market area at competitive prices, regardless of portfolio size.

In the view of the parties conducting this consultation, entry of new network users into this relevant market is not unduly restricted. The proposed within day incentive mechanism does involve limitations. However, this limitation is appropriate for the following reasons:

(1) No fees are incurred if the quantity differences recorded for a balancing group remain within the daily tolerance.
(2) The amount of billable fees in the event that the daily tolerance is exceeded is calculated based on costs incurred. If the costs are low, the specific flexibility overrun fee is correspondingly low. If no costs are incurred, no flexibility fee is charged.

(3) Balancing group managers have sufficient opportunity to keep their portfolios within the tolerance limits. The proposed daily tolerance of +/- 7.5% on the daily offtake quantity is sufficient to allow even a balancing group manager who is totally new in the market and only supplies a few customers to provide gas without incurring any flexibility overrun charges. In addition, the daily tolerance is limited in order to limit the potential amount of balancing gas costs and to prevent a partial utilisation of the tolerance at the expense of other market participants. This becomes increasingly easy with larger portfolio sizes, although a significant effect can already be seen with small portfolios of around ten customers. If a balancing group manager's portfolio comprises a few customers with very low load factors the balancing group manager must project his offtakes reasonably, but this is normal market behaviour. The proposed system incentivises precisely such forecasting.

The sample calculations provided in Section 2.3 show that the tolerance level, realistically feasible forecasting and potential flexibility overrun charges are reasonably proportionate to each other.

(b) A within day obligation shall only be applied where the network users are provided with adequate information before a potential within day charge is applied regarding their inputs and/or offtakes and have reasonable means to respond to manage their exposure.³

Status quo regarding within day data provision

Currently, once per day all network operators operating networks with system exit points (so-called exit network operator, ENO) measure the hourly quantities supplied at exit points to RLM end users between the hours of 06:00 and 12:00 noon. Conversion to kWh is done based on metered values and a specific calorific value set for balancing purposes. The hourly load profiles thus obtained are aggregated per balancing group or balancing subgroup and sent to the MAM by no later than 18:00, who forwards these to the balancing group managers by 19:00.

³ Article 26 (2) (b) NC BAL
Network users have the full information transparently at their disposal in advance for nominated network points and SLP end users.

Proposal for within day data provision

In view of the implementation proposals outlined in this document and in line with NC BAL requirements, balancing group managers should be provided twice daily with intraday consumption data in relation to RLM end users. Pursuant to Article 34 NC BAL, the first update must cover at least four hours of gas flows. Additionally, the hourly load data must be submitted to the balancing group managers within four hours after the gas flow. The exit network operators and the MAMs have agreed that the exit network operators will have three hours (currently six hours) and the MAM one hour (currently one hour) to process the data. A further expansion of within day data reporting is not considered productive at this time. Pursuant to Article 38 NC BAL however, the TSOs and MAMs will prepare a cost benefit analysis within two years of NC BAL entering into force on whether a greater frequency, shorter deadlines and/or an enhanced data quality of the intraday data provision are recommendable. This cost benefit analysis can then form the basis for decision-making by the Federal Network Agency on any changes regarding data provision.

The TSOs and MAMs support the proposal developed within the BDEW that the second data delivery should contain updated data from the first time window in addition to data from the second time window, the data from the first time window being overwritten. The precise structure of the time windows in compliance with aforementioned rules must be approved or determined by the Federal Network Agency. The TSOs and MAMs underscore the importance of the second intraday data report being delivered to the balancing group managers by no later than 18:00. Later delivery outside of this timeframe should be avoided due to the manual interference in the data provision process previously required in order to ensure corresponding data quality.

As a result, the frequency of intraday data provision is doubled -- while reducing the time between measurement of the gas flow and communication to the balancing group managers.

Currently, allocation values in intraday data reports can still be corrected retroactively up to the date M+12 (substitute values). Given that balancing group managers currently control inputs to and offtakes from their balancing groups using preliminary
intraday data they are exposed to financial risk. This risk is to be reduced insofar as the calculations for imbalance charge payments and any flexibility fee payments will be calculated on the basis of D+1 data. Following the end of the delivery month (M+12) the exit network operators submit adjusted values (substitute or calorific value corrections) to the MAM. The quantity differences between D+1 and M+12 are calculated for each day and billed at the respective hub price. Balancing group managers would thus no longer be billed at imbalance prices for retroactive adjustments of allocation data which they are not responsible for. For this billing process a clearing procedure yet to be defined is required. The RLM quantity reconciliation procedure between the exit network operators and shippers would be thereby eliminated.
Conclusion

Balancing group managers are under a duty to forecast gas sales and ensure an even balance within the balancing period⁴. Accurate forecasting, the ability to re-nominate input quantities (the re-nomination period at the VTP is to be 30 minutes pursuant to Article 5 (3) NC BAL), two within day deliveries of RLM load data (i.e. doubling the deliveries compared to the current procedure while shortening the applicable time limits) and the calculation of the quantity relevant for billing purposes based on D+1 data give balancing group managers reasonable means for keeping their balancing portfolios as balanced as possible, including on a within day basis.

(c) The main costs to be incurred by the network customers in relation to their balancing obligations shall relate to their position at the end of the gas day.⁵

Article 26 (2) (c) NC BAL provides that the main costs incurred by network customers as a result of their balancing obligations must be related to their balancing position at the end of the gas day. It is advisable to first consider the factors which affect the costs incurred in respect of the within day obligations and the costs for the balancing position at the end of the gas day.

Within day obligations

- Flexibility fee: Price spread between counter-directional balancing actions
- Quantity: the quantity relevant for billing purposes which exceeds the granted daily tolerance
- Billing prerequisites: The flexibility fee is only charged on days where there are counter-directional purchases and sales of balancing gas (regardless of the type of product called or the location) in the same gas quality and there is a remaining difference after offsetting with the quantities commercially converted on that day.

Balancing position at the end of the gas day

- Price: Imbalance price

⁴ References include Article 4 (1) NC BAL, Article 22 (3) Gas Network Access Regulations (GasNZV), Article 3 of Regulation (EU) No. 994/2010
⁵ Article 26 (2) (c) NC BAL
• Quantity and billing prerequisites: Remaining difference between inputs to and offtakes from the balancing group at the end of the gas day

Comparison of factors and evaluation

The flexibility fee is only billed on days when there are counter-directional purchases and sales of balancing gas. Billing of the imbalance charge however occurs daily if there are remaining differences in the balancing group at the end of the gas day.

In the NCG market area in the period 01/10/2012 - 01/10/2013 there were only 25 days on which a price would have been calculated due to counter-directional balancing actions, resulting in the flexibility fee being charged for within day differences in the balancing group. In the current gas year there are potentially nine days through 31/12/2013.

In the GASPOOL market area, only the period from 01/10/2013 can be considered reliably, as before that date within day imbalances were levelled out through other balancing products. In the period from 01/10/2013 to 31/12/2013 there were only six days on which counter-directional balancing actions were taken. A final statement can only be made after M+2M, as currently the commercial conversion quantities for months after September 2013 are not available.

However, the historical data analysis performed is only of limited value for forecasting purposes due to the time period concerned and the fact that product use may have changed.

Thus it can be summarised that due to

• appropriate daily tolerances being granted

• the fact that billing only takes place on days with quality-specific counter-directional balancing actions, and

• the fact that the quantity relevant for billing purposes is always less than the imbalance quantity,

it is ensured that the main costs incurred by network users under the balancing regime are not determined by the flexibility fee but rather related to the balancing position at the end of the day.
(d) To the extent possible, within day charges shall be reflective of the costs of the transmission system operator for the undertaking of any associated balancing actions.\(^6\)

Under the model presented here, the MAM only charges flexibility fees when counterdirectional balancing actions were actually taken. The billing principle involved is thus proper in terms of causation. Using the price spread for counter-directional balancing actions takes account of actual costs incurred.

(e) A within day obligation will not result in network users being financially settled to a position of zero during the gas day.\(^7\)

Billing for balancing portfolios occurs daily for gas balancing pursuant to Article 21 NC BAL. The model for a within day incentive mechanism as presented in this document meets this requirement, as there is no hourly billing for quantities (within or outside the daily tolerance) at the imbalance price. Daily quantities are thus unaffected by the within day obligation.

(f) The benefits of introducing a within day obligation in terms of economic and efficient operation of the transmission network outweigh any potential negative impacts thereof, including on liquidity of trades at the virtual trading point.\(^8\)

The analysis of various scenarios has shown that a balancing model providing no within day incentives is difficult to assess in the full scope of its implications. It is likely though that there would be more short-term balancing group actions towards the end of the gas day. This would generate high costs in the short term due to increased counter-directional balancing actions being required. Because internal balancing gas is insufficient for the necessary structuring and the scenario analyses demonstrated that demand for required external balancing gas is unlikely to be met, network and supply security would be jeopardised. To minimise this risk, the TSOs see incentives as absolutely necessary for keeping balancing groups as balanced as possible on a within day basis as well.

The proposed model for a within day incentive mechanism has no unreasonably adverse effects on balancing group managers due to the combination of daily tolerance (instead of an hourly tolerance) and billing for flexibility fees upon

\(^6\) Article 26 (2) (d) NC BAL
\(^7\) Article 26 (2) (e) NC BAL
\(^8\) Article 26 (2) (f) NC BAL
exceeding the tolerance only occurring in the event counter-directional structuring is necessary by the TSO/MAM (instead of charging a flat fee for exceeding the tolerance limit). Additionally, as outlined above in Section 2.5a, there would be no negative impact on liquidity at trading points. Experience with the current within day incentive mechanism in place indicates that liquidity at trading points will not be adversely affected.
3 Imbalance charges

Article 19 (1) NC BAL provides for daily imbalance charges. Under such a system network users pay or receive imbalance charges for their daily imbalance quantities, with the prices being based on the cost incurred for balancing actions.

According to Article 20 (1) NC BAL, the MAMs must submit to the Federal Network Agency a methodology for the calculation of imbalance charges which outlines

- the calculation of the daily imbalance quantity referred to in Article 21 NC BAL
- the derivation of the applicable price referred to in Article 22 NC BAL, and
- any other necessary parameter.

Consultation is not required under NC BAL. The TSOs and MAMs believe however that including this description in the consultation document is beneficial for market participants as it involves them as early on as possible and allows for consideration of feedback.

The methodology within the meaning of Article 20 NC BAL proposed by the MAMs is presented in the following.

Calculation of the daily imbalance quantity:

Pursuant to Article 21 (1) NC BAL, the daily imbalance quantity (in respect of a gas day) of a network user's balancing portfolio is the net balance of daily inputs and offtakes.

According to Article 21 (2) NC BAL, this calculation logic may only be adapted where linepack flexibility services are offered and/or an arrangement is in place allowing network users to use gas (such as gas in kind):

- to cover any gas unaccounted for as offtaken from the system (e.g. network losses or metering errors), and/or
- to cover any gas used by transmission system operators for the operation of the system (e.g. fuel gas).

The above exceptions are not planned to be implemented in the German balancing model.

A linepack flexibility service is not going to be offered, as the linepack is utilised as an internal balancing action.
An adjustment of the imbalance quantity due to the two other points mentioned is therefore unnecessary, as on the one hand network losses and metering inaccuracies are already accounted for as part of the balancing gas quantities procured from the market by the MAMs and thus are collected in the balancing neutrality account, and, on the other hand, transmission system operators' own use gas is allocated as an offtake, so no imbalances result in the network user's balancing portfolio.

Pursuant to Article 21 (6) NC BAL, the 'final' imbalance quantity forms the basis for the daily imbalance charge; the final imbalance quantity is calculated based on D+1 data (see Section 2.5). Where a network user's daily inputs differ from the network user's offtakes - each as calculated using D+1 data - the portfolio is deemed to be out of balance and daily imbalance charges pursuant to Article 23 NC BAL apply. These charges will not be applied to balanced portfolios.

In accordance with the rules currently in force, the imbalance quantity relevant for billing will be the imbalance recorded for the invoice balancing group in cases where different balancing groups are linked. Under today's system, imbalances arising in the subordinate balancing groups or balancing subgroups are transferred to the respective invoice balancing group and aggregated there. Under this approach a network user's entire balancing portfolio is considered, so that any imbalances arising within linked balancing groups and the associated balancing subgroups can be levelled out. Portfolio effects can thus reduce the imbalance quantity for the entire balancing portfolio.

Derivation of the applicable price:

In accordance with Article 22 NC BAL the applicable price for the calculation of the daily imbalance charge as provided in Article 23 NC BAL is determined using the marginal sell price or marginal buy price, the marginal sell price being applied given a positive imbalance quantity (inputs > offtakes) and the marginal buy price being applied given a negative imbalance quantity (inputs < offtakes).

Pursuant to Article 22 (2) NC BAL, the marginal sell and buy prices are calculated for each gas day.

The marginal sell price within the meaning of Article 22 (2) NC BAL is the lowest price of any sales of products with delivery at the Virtual Trading Point (VTP) in which the MAM is involved for the respective gas day, or if lower, the weighted average price of gas less any small adjustment where applicable, the weighted average price of gas
being the weighted average price of all energy quantities traded through products with delivery at the VTP transacted for the respective gas day.

The marginal buy price within the meaning of Article 22 (2) NC BAL is the highest price of any purchases of products with delivery at the VTP in which the MAM is involved for the respective gas day, or if higher, the weighted average price of gas less any small adjustment where applicable.

Figure 10 shows an example of prices in a MAM's purchase and sale transactions and the weighted average price of gas for a gas day. At the end of the relevant gas day, the respective marginal prices are calculated on this basis, the marginal buy price being the highest price of all purchase transactions and the marginal sell price being the lowest price of all sale transactions:

![Figure 10: Imbalance pricing system (source ENTSOG)](image)

While Article 22 (2) and (3) NC BAL require the MAMs to determine prices based on products with delivery at the VTP, Article 22 (5) additionally allows for the use of locational products when calculating the marginal sell price, the marginal buy price and the weighted average price of gas; in this context the extent to which the MAM employs these products is to be taken into account.

In contrast to NC BAL, in Germany there are three different categories of short-term products used by MAMs. The first, as outlined in NC BAL, is a product with delivery at the VTP. The second category comprises products which have a physical, quality-specific effect in the market area (either in the high-cal H gas network area or the low-cal L gas network area of the market area, a so-called Quality product). Such products are necessary given that the German market areas extend across networks flowing
gas in different gas qualities (cross-quality market areas), as discussed further below. The third category is for products which have a local effect.

As NC BAL does not provide for quality-specific products, these (together with local products) fall into the category of locational products as provided for in NC BAL.

Given this background, the MAMs intend to rely on Article 22 (5) NC BAL to include at least also the exchange-based trades in quality-specific products in addition to the global title products sourced at the VTP to determine the marginal sell price, the marginal buy price and the weighted average price of gas. The above products also include purchases of balancing gas on the exchange with delivery at the Title Transfer Facility (TTF) hub in the Netherlands, as this product has a quality-specific effect as well.

If the necessity arises – for example when requiring network-specific products not offered on the exchange or when falling back to other non-exchange-based purchasing options, for example in times of insufficient liquidity for quality-specific products – the MAMs would like to be able to factor in other products when calculating prices. This includes the procurement of balancing gas through the MAMs’ physical balancing platforms.

Thus the parties conducting the consultation believe all quantities purchased on the exchange or through physical balancing platforms should be used for price determination. As regards the exchange-based products this includes both day-ahead and within-day transactions with delivery at the VTP of the MAM’s own market area, quality-specific products in the MAM’s own market area and the purchases in adjacent market areas as well as non-exchange-traded locational products, where applicable.

In the view of the MAMs they need to also include the quality-specific products given the physical separation of the L and H gas networks in the German market areas NCG and GASPOOL. This makes the use of quality-specific products necessary, as otherwise the location where the physical effect occurs (in the H gas network or L gas network) cannot be managed. In the case of call orders for global quantities to be made available at the VTP, the effect occurs somewhere in the cross-quality market area. This is tolerable with regard to controlling network areas only as long as there are sufficient conversion possibilities between network areas, or if by chance there is an oversupply or undersupply in both network areas. Whenever a specific network area
needs to be controlled exactly, this can only be done using quality-specific or locational products.

The figures below illustrate – by showing the shares of the different types of products used in the German market areas NCG and GASPOOL – why the MAMs need to at least include quality-specific products for the purpose of price calculations:

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Figure 11: Share of call orders for quality-specific balancing products (in per cent), NCG market area

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9 The diversified procurement of balancing gas (separate reporting for "Quality" and "Global") was made possible by the formation of cross-quality market area as at 01/04/2011 and the availability of technical mixing plants.
On the basis of Article 22 (2), (3) & (5) NC BAL, the following price calculation is expected to be employed when the new balancing regime is launched:

The marginal sell price for a market area is the lowest price of all sales of exchange-traded products with delivery at the VTP, quality-specific H & L gas products, products with delivery at the TTF where used to meet a quality-specific balancing requirement, as well as locational products, if any, in which the respective MAM is involved for the gas day concerned, or if lower, the weighted average price of gas less any small adjustment where applicable.

The marginal buy price for a market area is the highest price of all purchases of exchange-traded products with delivery at the VTP, quality-specific H & L gas products, products with delivery at the TTF where used to meet a quality-specific balancing requirement, as well as locational products, if any, in which the respective MAM is involved for the gas day concerned, or if higher, the weighted average price of gas less any small adjustment where applicable.

The MAMs are currently reviewing whether to include locational products in the price calculation. Where the weighted average price of gas is used for price determination,
Article 22 (7) NC BAL permits MAMs to introduce a small adjustment, which may not exceed ten per cent of the weighted average price of gas (see Figure 10). For any adjustments exceeding this limit an application must be submitted and they must be approved by the respective national regulatory authority.

At the present time the MAMs see no need to introduce a small adjustment, as the system for calculating the applicable prices for imbalance charges provides adequate incentives for balancing group managers to keep their balancing groups in balance.

The sufficient incentive as seen by the MAMs is represented by the planning uncertainty involved with the amount of the imbalance prices, proceeding from the fact that the MAMs’ purchases or sales of balancing gas could at any time lead to a less favourable imbalance price. In addition, the balancing group manager always has the option of purchasing required quantities on the exchange at the current price, so obtaining quantities through the imbalance mechanism with its associated risks is not necessary.

Other necessary parameters:

To our knowledge, no other parameters within the meaning of Article 20 (3) (c) NC BAL are required at this time.
4 Interim measures

Articles 47 - 50 NC BAL provide that MAMs may submit requests for approval of interim measures. These include:

- a physical balancing platform (Article 47 NC BAL),
- an alternative to a physical balancing platform (Article 48 NC BAL),
- an interim imbalance charge (Article 49 NC BAL), and
- the use of tolerances (Article 50 NC BAL).

In addition to exchange-based trading, which under the target model is the primary means of procurement for standardised purchases and sales of short-term balancing gas from and to shippers in the NCG and GASPOOL market areas, the respective MAMs operate and use their own physical balancing platforms on which prequalified balancing gas suppliers can place offers and bids for the purchase and sale of gas required for balancing purposes. In respect of these bids/offers call orders can be issued by the MAM when needed.

The MAMs see a need for requesting as an interim measure continued use of the physical balancing platforms beyond the effective date of the regulation. As provided in Article 45 (4) NC BAL this would cover a period of five years. An extension of the approval by a maximum of five additional years may be approved by the Federal Network Agency in accordance with Article 47 (3) NC BAL.

At present it is not possible to estimate an end date for the interim measure, as the circumstances giving rise to its necessity as outlined below will likely remain in place, especially in relation to locational and point-specific products.

Introducing the interim measure is necessary as there are cases when the exchange-traded product alternatives are insufficient to meet the balancing requirements. This can be the case when a balancing action is required in a specific network zone or even at a specific system point. Meeting such requirements is extremely important for maintaining network stability. The products necessary in these types of situations are not offered on the exchange however.

Given that this concerns products which are not offered on the exchange, the liquidity of the short-term gas wholesale market is not influenced.
The balancing platforms are additionally used for tendering long-term and flexible balancing products which are likewise used to ensure network stability in the event of congestion and to provide quantities at specific network points.

The existing platforms also represent a fall-back solution in cases where the exchange is unavailable for technical reasons, e.g. planned and unplanned downtimes. For reference, a list of exchange downtimes is provided in the annex for the months October to December 2013. In view of the circumstances outlined above, physical balancing platforms must be part of the new balancing model for physical network stabilisation purposes.

For any consultations on interim measures a description of the state of development and of the liquidity of the short-term wholesale gas market at the time of report preparation is required. To the extent that relevant data were available or reported by EEX, these are listed in the following.

*Number of trades executed at the EEX virtual trading point within the meaning of Article 46, (1) (a) (i) NC BAL during the period 01/10/2012 – 30/09/2013:*

  - GASPOOL: 20,510 trades (16,674,597 MWh)
  - NCG: 36,172 trades (30,542,171 MWh)

*Bid/offer spread within the meaning of Article 46, (1) (a) (ii) NC BAL during the period 01/10/2012 – 30/09/2013:*

Tables 3 + 4 show the average spread and the best bid/offer spread for the market areas. The data only refer to the day-ahead spot market. No data were available for the rest-of-the-day market.

<table>
<thead>
<tr>
<th>GASPOOL</th>
<th>Oct '12</th>
<th>Nov '12</th>
<th>Dec '12</th>
<th>Jan '13</th>
<th>Feb '13</th>
<th>Mar '13</th>
<th>Apr '13</th>
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<th>Jul '13</th>
<th>Aug '13</th>
<th>Sep '13</th>
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</thead>
<tbody>
<tr>
<td>Best bid/offer spread</td>
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<td>0.01</td>
<td>0.02</td>
<td>0.01</td>
<td>0.01</td>
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<tr>
<td>Average spread</td>
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<td>0.44</td>
<td>3.00</td>
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<td>0.39</td>
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</table>

*Table 3: Spreads at EEX in the GASPOOL market area in [EUR/MWh]*
Table 4: Spreads at EEX in the NetConnect Germany market area in [EUR/MWh]

<table>
<thead>
<tr>
<th>NCG</th>
<th>Oct '12</th>
<th>Nov '12</th>
<th>Dec '12</th>
<th>Jan '13</th>
<th>Feb '13</th>
<th>Mar '13</th>
<th>Apr '13</th>
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</tr>
<tr>
<td>Average spread</td>
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<td>0.46</td>
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<td>0.29</td>
<td>0.95</td>
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Table 5: Trading participants active on the EEX

<table>
<thead>
<tr>
<th>NCG</th>
<th>Number of participants having access to the EEX short-term wholesale gas market within the meaning of Article 46 (1) (a) (iii) NC BAL</th>
<th>Number of participants having been active on the EEX short-term wholesale gas market within the meaning of Article 46 (1) (a) (iv) NC BAL</th>
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</thead>
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<tr>
<td>GASPOOL</td>
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<td>76</td>
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<td>NCG</td>
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Annex

Exchange downtimes (Oct. - Dec. 2013):

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<th>From</th>
<th>To</th>
<th>Affected by the downtime:</th>
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<td>05/10/2013, 16:00</td>
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<td>Trayport for NCG, Gaspool and TTF</td>
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<tr>
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<td>NCG, Gaspool and TTF</td>
</tr>
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<td>PEGAS and ComXerv</td>
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<td>Trayport for NCG</td>
</tr>
<tr>
<td>07/12/2013, 16:00</td>
<td>07/12/2013, 16:30</td>
<td>Trayport for NCG, Gaspool and TTF</td>
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