NetConnect Germany

simply gas

Annual System Balancing Report pursuant to the GaBi Gas 2.0 ruling

Current as at November 2017

TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

TABLE OF ABBREVIATIONS

BAL Code	Regulation (EU) No 312/2014 establishing a Network Code on Gas Balancing of Transmission Networks
BGM	balancing group manager
BK7	the Federal Network Agency's Ruling Chamber No. 7 (*Beschlusskammer*)
BMWi	the German Federal Ministry for Economic Affairs and Energy (*Bundesministerium für Wirtschaft und Energie*)
DA	day-ahead
DSM	Demand-Side Management (balancing product)
Federal Network Agency	the German national regulatory authority (*Bundesnetzagentur*)
GaBi Gas 2.0	the administrative ruling on gas balancing handed down by the Federal Network Agency on 19 December 2014 (ref: BK7-14-020)
GY	gas year
ICE Endex	the Intercontinental Exchange
ID	individual days
IP	interconnection point
Konni Gas	the administrative ruling on the gas quality conversion mechanism handed down by the Federal Network Agency on 27 March 2012 (ref: BK7-11-002), as amended by the administrative ruling BK7-16-050 dated 21 December 2016
LTO	Long-Term Option (balancing product)
MA	market area
MAM	market area manager
MOL	merit order list
MOL 1	exchange-traded spot contracts for delivery of gas at the NCG VTP
MOL 2	exchange-traded spot contracts for delivery of gas at the NCG VTP (high CV gas/low CV gas)
MOL 3	short-term bilateral balancing products for delivery of gas at the NCG VTP (high CV gas/low CV gas) contracted through the NCG platform
MOL 4	long-term bilateral balancing products contracted through the NCG platform
NCG	NetConnect Germany GmbH & Co. KG
OBA	operational balancing account
PEGAS	the Pan-European Gas Cooperation
Q	quarter
RoD	rest-of-the-day
SA	Saturday
STB	Short-Term Balancing Service (balancing product)
SU	Sunday
TTF	Title Transfer Facility
VIP	virtual interconnection point
W	calendar week
WD	within-day

1. INTRODUCTION

Section 9(a) of the operative provisions of the administrative ruling on gas balancing handed down by the German national regulatory authority Bundesnetzagentur (below referred to as the "Federal Network Agency") on 19 December 2014 (the so-called "GaBi Gas 2.0" decision) places an obligation on NetConnect Germany GmbH & Co. KG (NCG) in its role as market area manager (MAM) of the market area NetConnect Germany to submit a summary report to the Federal Network Agency's Ruling Chamber No. 7 once a year, in which NCG is to report on the internal and external balancing actions in its market area as well as on the related procurement activities.

This second System Balancing Report covers the gas year (GY) 16/17 and describes current developments in our balancing activities, which are analysed in comparison with the previous GY 15/16. It also includes additional analyses in fulfilment of our annual review obligations under the GaBi Gas 2.0 ruling and under the Network Code on Gas Balancing of Transmission Networks (below referred to as the "BAL Code"). In this report we describe and review the interim measures approved or planned under Article 46 of the BAL Code, provide a review of our use of balancing services in accordance with Article 8(6) of the BAL Code and analyse our balancing-related procurement activities in adjacent market areas and the associated balancing actions pursuant to Article 9(3) of the BAL Code.

Chapters 2 and 3 of this year's System Balancing Report describe the internal and external balancing actions and related procurement activities NCG has carried out in accordance with the merit order set out in the GaBi Gas 2.0 ruling (the so-called "merit order list", usually abbreviated to "MOL"). In the following chapter we analyse for the first time whether and in what way the introduction of the within-day obligation rules impacts the scale of our within-day balancing actions taking place in opposite directions. Our use of balancing services, which rank at MOL 4, is described in chapter 5. Following this, we present the measures to further increase natural gas supply security in our market area we have taken in accordance with the corresponding policy paper published on 16 December 2015 by the German Federal Ministry for Economic Affairs and Energy (BMWi; the policy paper is referred to below as the "BMWi policy paper"). The locational balancing products used by NCG in GY 16/17 are described in chapter 7. Chapter 8 contains an analysis of the necessity of interim measures pursuant to Article 46 of the BAL Code. Moving on from the topics covering our main balancing activities, in chapters 9 to 11 we provide our annual review of the cost allocation methodology used under the balancing neutrality arrangements (chapter 9), describe our approach to managing the supply of gas to certain extraterritorial network areas, an activity that falls within the category "other balancing activities" (chapter 10), and provide information on the fees and neutrality charges we levy from 1 October 2017 under the GaBi Gas 2.0 ruling as well as under the administrative ruling governing the gas quality conversion mechanism in the German multi-quality gas market areas (the so-called "Konni Gas" decision) along with information on potential surplus distributions under the corresponding neutrality mechanisms.

We conclude this year's System Balancing Report by summarising our key findings from the above chapters.

2. INTERNAL BALANCING ACTIONS

The charts in this chapter show the gas quantities that were provided in each direction (positive/negative) in the course of the so-called "internal" balancing actions (i.e. balancing actions effected by network operators by way of linepack and network storage measures) taken in the market area NetConnect Germany in GY 2015/16 and GY 2016/17, with separate charts being provided for the two gas qualities high-cal gas (below referred to as "high CV gas") and low-cal gas (below referred to as "low CV gas"). Figure 1 shows the internal balancing actions taken in the high CV network areas and Figure 2 those carried out in the low CV network areas, with all quantities provided on a monthly basis. It can generally be noted that the internal balancing quantities have been almost at the same level for four years now, with only a slight increase notable.

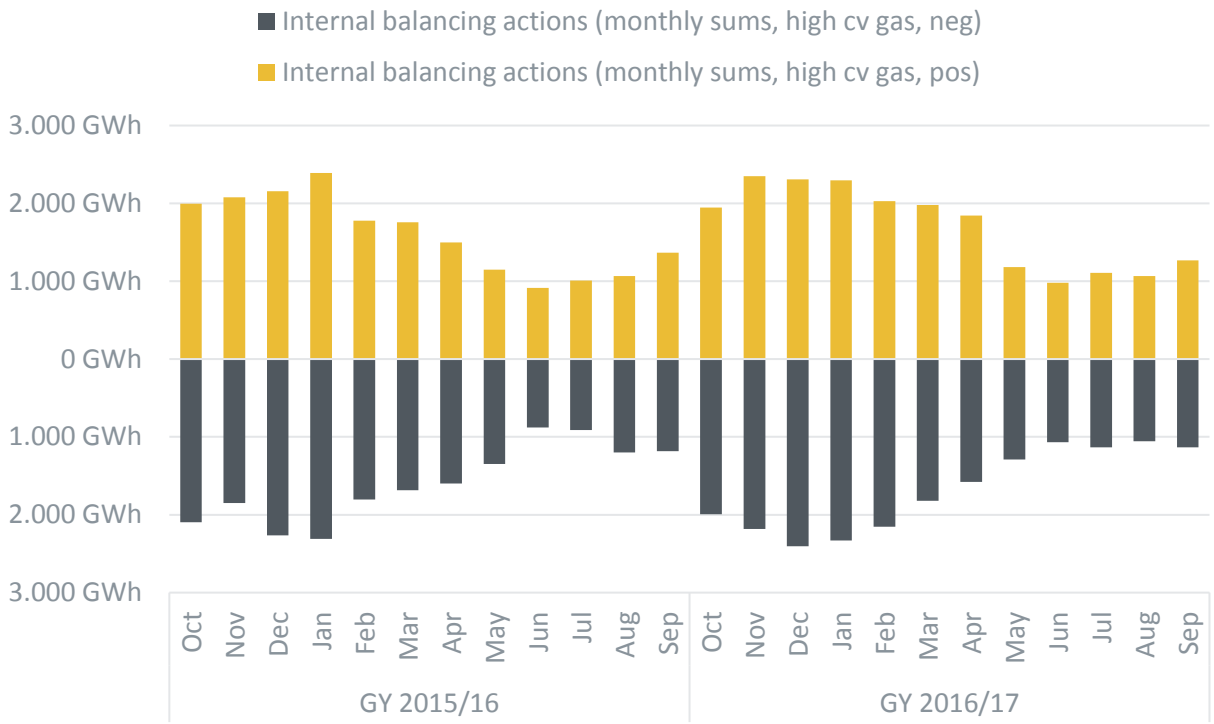

Figure 1: Internal balancing actions – quantities (high CV gas; by month)

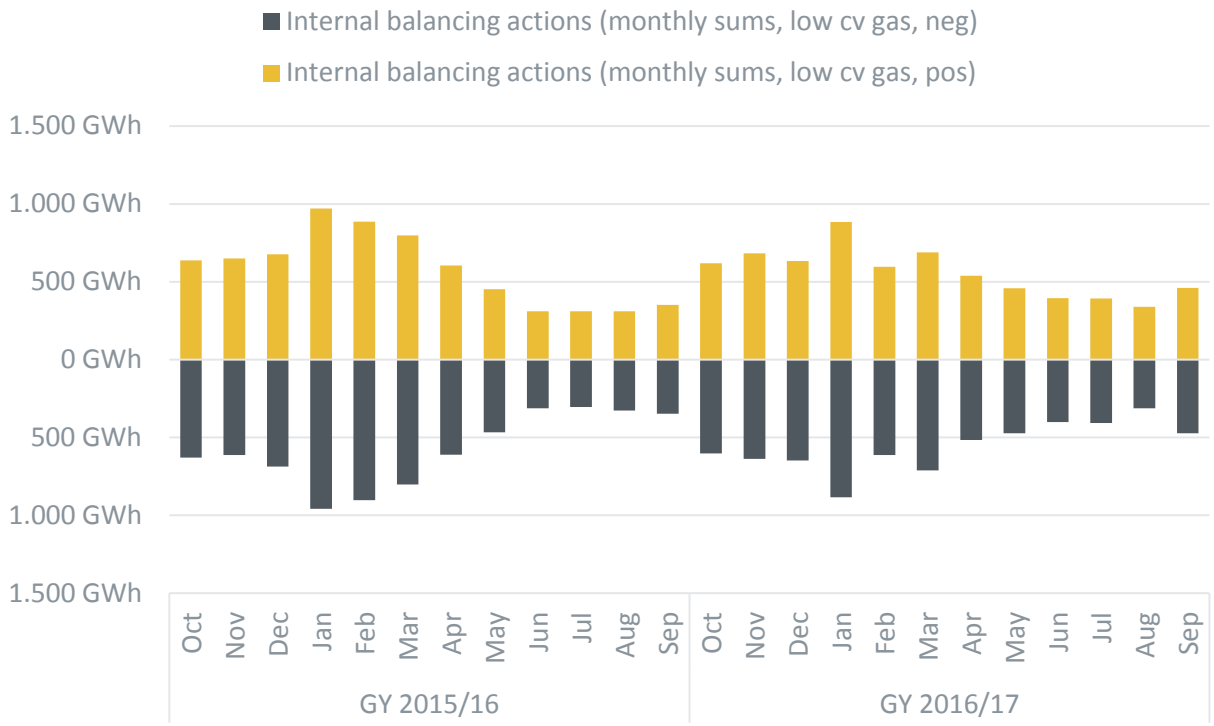

Figure 2: Internal balancing actions – quantities (low CV gas; by month)

3. EXTERNAL BALANCING ACTIONS AND RELATED PROCUREMENT ACTIVITIES

3.1. OVERVIEW OF SYSTEMBUY AND SYSTEMSELL BALANCING ACTIONS BY MOL

PRODUCT PORTFOLIO AVAILABLE FOR BALANCING ACTIONS

We use a wide variety of exchange-traded as well as bilaterally contracted balancing products to procure the gas and services we need to meet our external balancing requirements (i.e. those balancing requirements that cannot (fully) be met by means of the internal balancing tools available). Figure 3 shows the NCG balancing product portfolio as arranged by MOL and balancing criterion.

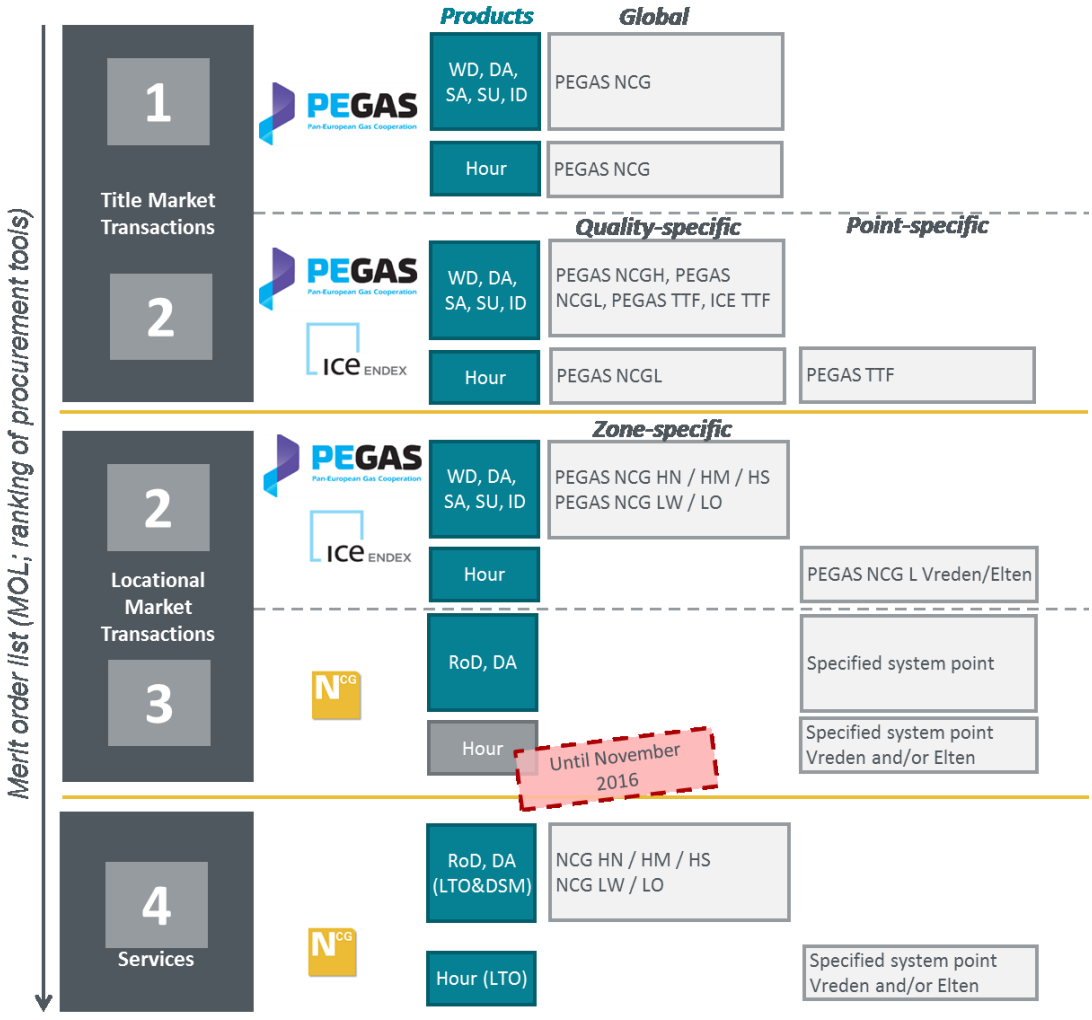

Figure 3: Overview of balancing products used in GY 16/17

Quantities supplied/received and associated costs by MOL

Below we describe the gas quantities that were supplied and received in the course of our external balancing actions in GY 15/16 and GY 16/17 as well as the associated costs and revenues, with the corresponding information being provided separately for SystemBuy balancing actions (purchases of gas for system balancing purposes) and SystemSell balancing actions (sales of gas for system balancing purposes) as well as by MOL.

Figure 4 shows the balancing quantities we procured on a day-ahead basis (product variant "DA") by MOL, month and direction (SystemBuy/SystemSell) along with the associated costs and revenues. The balancing quantities we procured on a rest-of-the-day basis (product variant "RoD") are shown in Figure 5.

Compared with GY 15/16, our external balancing quantities (excluding the "Hour" product variant, where balancing actions are required at specific system points in specific individual hours) nearly fell by half in GY 16/17, from a total of 84,000 GWh to 44,000 GWh. Also, the proportion of global, MOL 1 balancing actions (RoD and DA) went up ("global" means that no specific physical delivery restrictions as to gas quality or location apply). While in GY 15/16 MOL 1 balancing actions via spot market trades on PEGAS using title products for delivery of gas at the NCG VTP accounted for no more than 6% of our total balancing requirements, this share rose to 11% in GY 16/17. MOL 1 balancing actions are only taken if there is sufficient capacity available to technically convert the required quantities, taking into account the overall state of the high CV and low CV networks, the calorific properties of the gas and the availability of the relevant facilities (measures etc.).

The proportion of our MOL 2 balancing actions using quality-specific products (i.e. where either high CV or low CV gas is expressly required) fell from 93% in GY 15/16 to 89% in GY 16/17. This development is due to changes in market participants' use of the virtual gas quality conversion mechanism, among other factors. In GY 15/16 a net quantity of 27,000 GWh was virtually converted from high CV to low CV quality. The net direction of conversion reversed in GY 16/17, with conversion now taking place from low CV to high CV quality and the total net virtual conversion quantity falling to some 22,000 GWh. Conversion activities in this direction facilitate the deployment of the technical mixing plants in the network area of Open Grid Europe GmbH (OGE) as well as quantity swaps between adjacent transmission system operators (TSOs). Both of these have the effect of reducing the need for commercial conversion measures, for which purpose we would otherwise have to take balancing actions in opposite directions (by both buying and selling gas for balancing purposes on the same gas day).

Only 0.1% of our quality-specific balancing requirements were met through our bilateral short-term balancing products ranking at MOL 3. These minor quantities had to be procured bilaterally because the exchange was unavailable due to planned maintenance works or unplanned downtimes at the time and we were thus unable to take balancing actions via the exchange.

As sufficient quantities were available within MOL 1 and MOL 2, the existing contracts for our MOL 4 balancing product "Long-Term Options" (LTO), which is contracted ahead on a

long-term basis, were only used to request delivery as part of test call orders issued on some of our LTO contracts, with only the product variant “RoD” being affected.

Similar to the situation for our RoD and DA balancing actions, our hourly balancing requirements at specific points (below referred to as “point-specific” balancing requirements) were also almost entirely met using MOL 2 products. Since May 2016 we have taken over 99% of our point-specific balancing actions via PEGAS by trading in the point-specific order books for hourly delivery at the cross-border interconnection points (IP) at Elten/Zevenaar and Vreden/Winterswijk (see Figure 6).

In Figure 7 the balancing quantities procured in each merit order rank are broken down by product variant (DA, RoD and Hour) and day of the week. The delivery rates we requested on a DA and RoD basis are shown by time (commencement of delivery) in Figure 8.

Table 1 (EUR) and Table 2 (GWh) provide an overview of our costs/revenues and balancing quantities by MOL and direction for each of the gas years covered by this report.

Figure 4: External balancing actions – quantities and costs/revenues (DA by MOL and month)

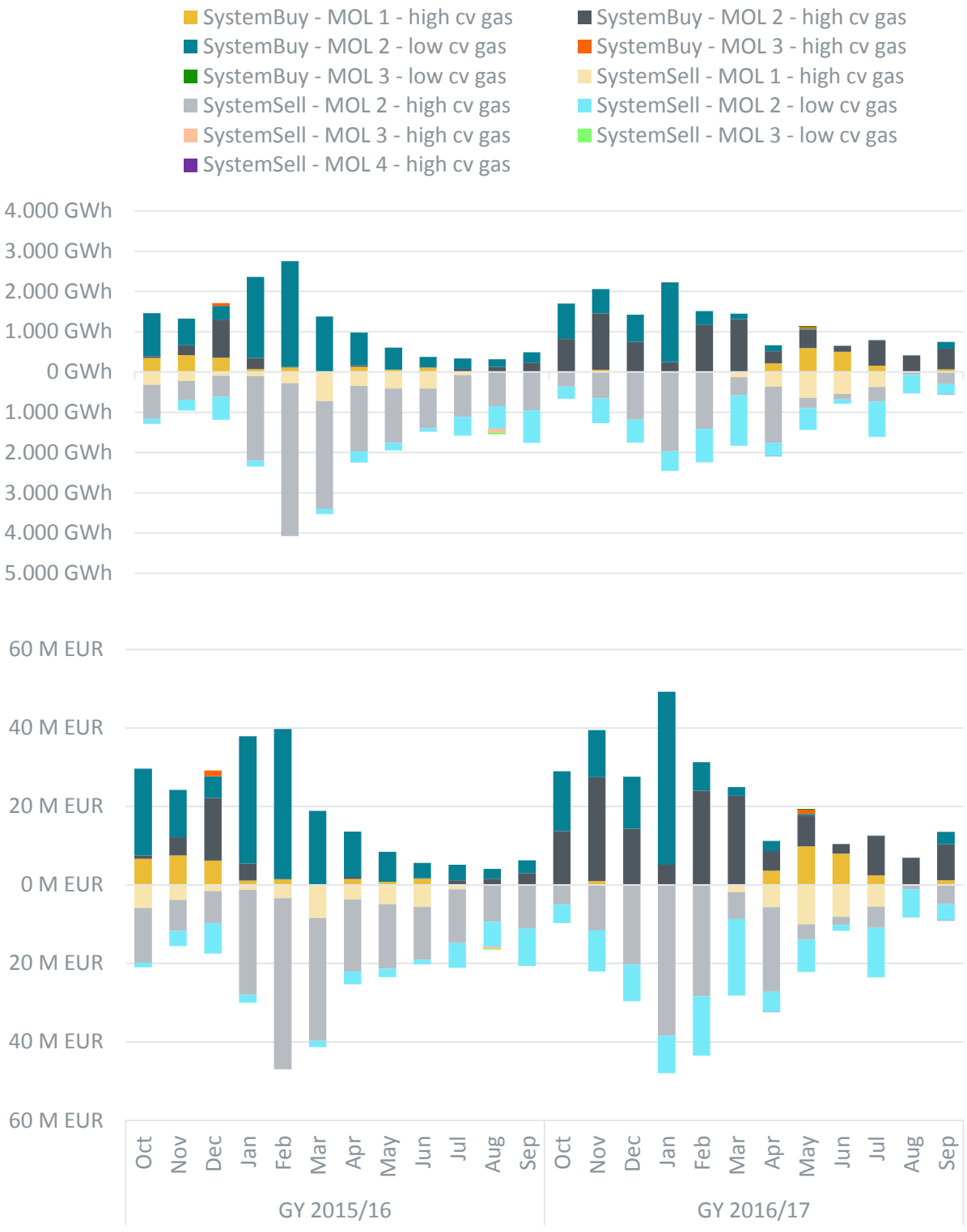

Figure 5: External balancing actions – quantities and costs/revenues (RoD by MOL and month)

Figure 6: External balancing actions – quantities and costs/revenues (Hour by MOL and month)

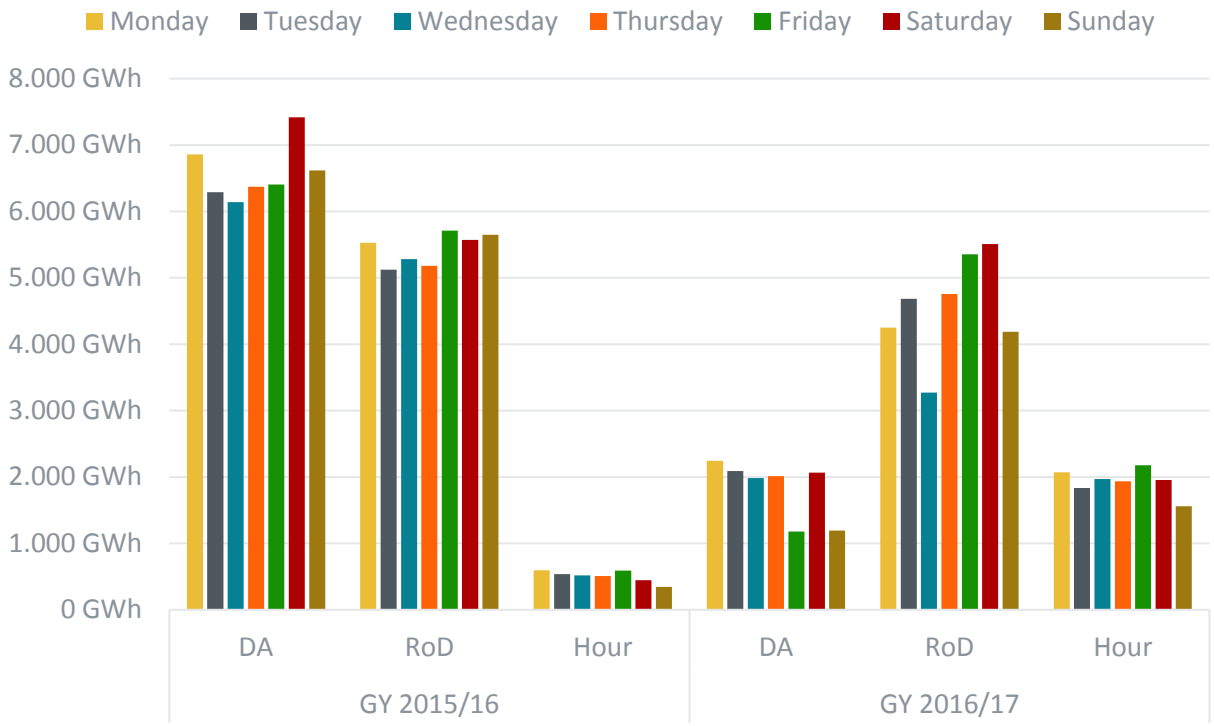

Figure 7: External balancing actions – quantities (DA, RoD and Hour by day of the week)

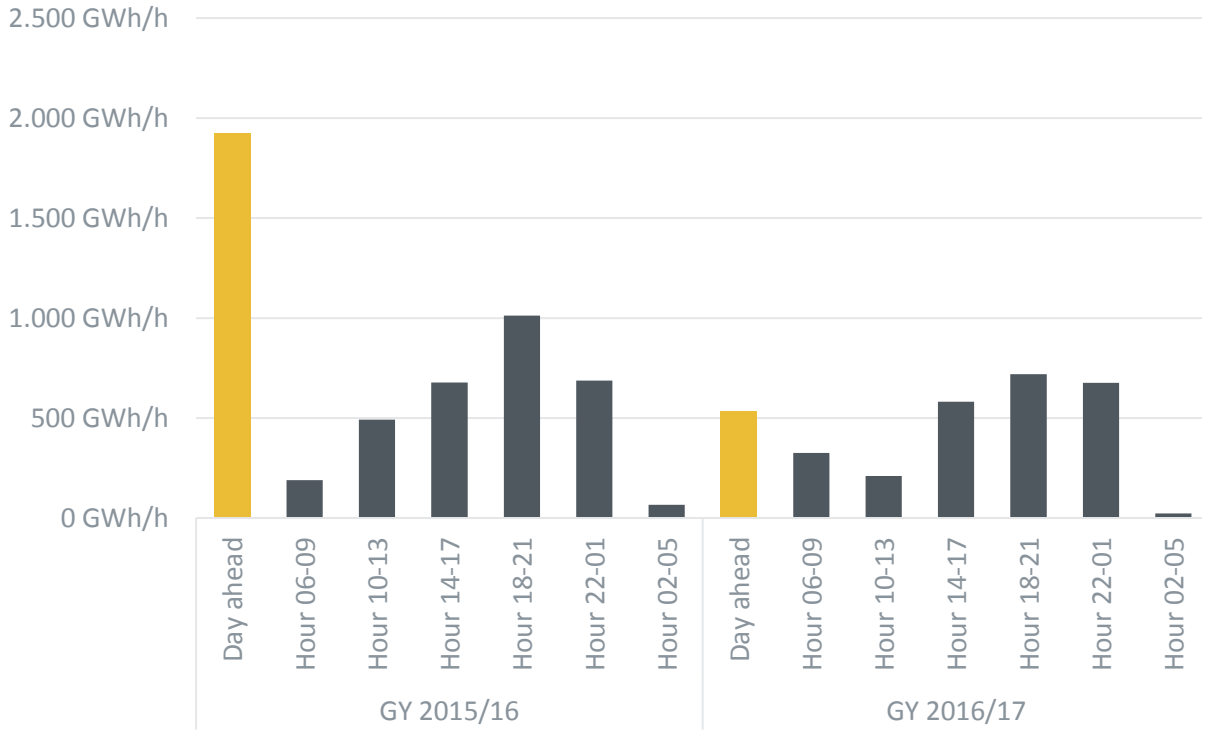

Figure 8: External balancing actions – delivery rates (DA and RoD by call hour)

Balancing costs/revenues	GY 2015/16		GY 2016/17	
	Costs (SystemBuy)	Revenues (SystemSell)	Costs (SystemBuy)	Revenues (SystemSell)
MOL 1	**€38,850,156.79**	**€40,489,178.32**	**€32,437,025.66**	**€42,411,133.62**
DA	€11,829,676.80	€729,514.80	€6,390,246.00	€11,174,161.20
RoD	€27,020,479.99	€39,759,663.52	€26,046,779.66	€31,236,972.42
MOL 2	**€643,219,512.69**	**€491,266,861.44**	**€557,456,564.07**	**€423,965,231.01**
DA	€410,266,164.70	€214,117,209.05	€155,454,341.71	€63,848,466.00
RoD	€194,233,972.80	€259,352,844.74	€248,169,504.62	€256,779,123.15
Hour	€38,719,375.19	€17,796,807.65	€153,832,717.74	€103,337,641.86
MOL 3	**€1,692,282.00**	**€640,376.70**	**€1,286,449.60**	**€54,258.90**
RoD	€1,461,105.00	€603,183.40	€1,286,449.60	
Hour	€231,177.00	€37,193.30		€54,258.90
MOL 4	**€117,835.20**	**€65,582.50**	**€204,717.70**	**€1,188,755.00**
RoD				€13,489.00
Hour	€117,835.20	€65,582.50	€204,717.70	€1,175,266.00
Total	**€683,879,786.68**	**€532,461,998.96**	**€591,384,757.03**	**€467,619,378.53**

Table 1: External balancing costs/revenues (DA, RoD and Hour by MOL)

Balancing quantities	GY 2015/16		GY 2016/17	
	Quantity (SystemBuy)	Quantity (SystemSell)	Quantity (SystemBuy)	Quantity (SystemSell)
MOL 1	**2,291.2 GWh**	**3,046.4 GWh**	**1,975.5 GWh**	**2,793.1 GWh**
DA	688.8 GWh	41.7 GWh	398.3 GWh	730.0 GWh
RoD	1,602.4 GWh	3,004.7 GWh	1,577.2 GWh	2,063.2 GWh
MOL 2	**42,474.8 GWh**	**39,629.1 GWh**	**27,681.2 GWh**	**25,668.3 GWh**
DA	28,164.3 GWh	17,198.5 GWh	7,781.8 GWh	3,856.2 GWh
RoD	12,405.7 GWh	20,825.9 GWh	13,120.8 GWh	15,183.7 GWh
Hour	1,904.9 GWh	1,604.7 GWh	6,778.5 GWh	6,628.4 GWh
MOL 3	**76.0 GWh**	**135.8 GWh**	**65.4 GWh**	**8.6 GWh**
RoD	71.9 GWh	126.4 GWh	65.4 GWh	
Hour	4.1 GWh	9.4 GWh		8.6 GWh
MOL 4	**10.1 GWh**	**5.6 GWh**	**12.0 GWh**	**76.1 GWh**
RoD				0.8 GWh
Hour	10.1 GWh	5.6 GWh	12.0 GWh	75.3 GWh
Total	**44,852.2 GWh**	**42,816.9 GWh**	**29,734.1 GWh**	**28,546.2 GWh**

Table 2: External balancing quantities (DA, RoD and Hour by MOL)

Development of SystemBuy and SystemSell prices by MOL

In this chapter we provide information on the lowest ("min"), highest ("max") and average ("mean") monthly procurement prices we paid and received within each merit order rank to meet our respective SystemBuy and SystemSell balancing requirements.

It should be noted that – as was the case in GY 15/16 – nearly all balancing actions taken in GY 16/17 were priced at market price levels, with the volume-weighted average procurement prices (buy/sell) paid or received in relation to MOL 1 and MOL 2 balancing actions taken on a RoD and DA basis being almost entirely in a price range of ±2 EUR/MWh relative to the weighted average prices of gas traded on PEGAS. In both merit order ranks there have been improvements on the previous year, with 100% of MOL 1 lots falling in this price range (GY 15/16: 97%) and 96% of MOL 2 lots (up from 95%).

Figure 9 shows the procurement prices we paid and received for RoD and DA balancing actions in the high CV network areas (MOL 1 and higher) in GY 15/16 and GY 16/17.

Figure 10 shows the procurement prices we paid and received for RoD, DA and Hour balancing actions in the low CV network areas (MOL 2 and higher) in GY 15/16 and GY 16/17.

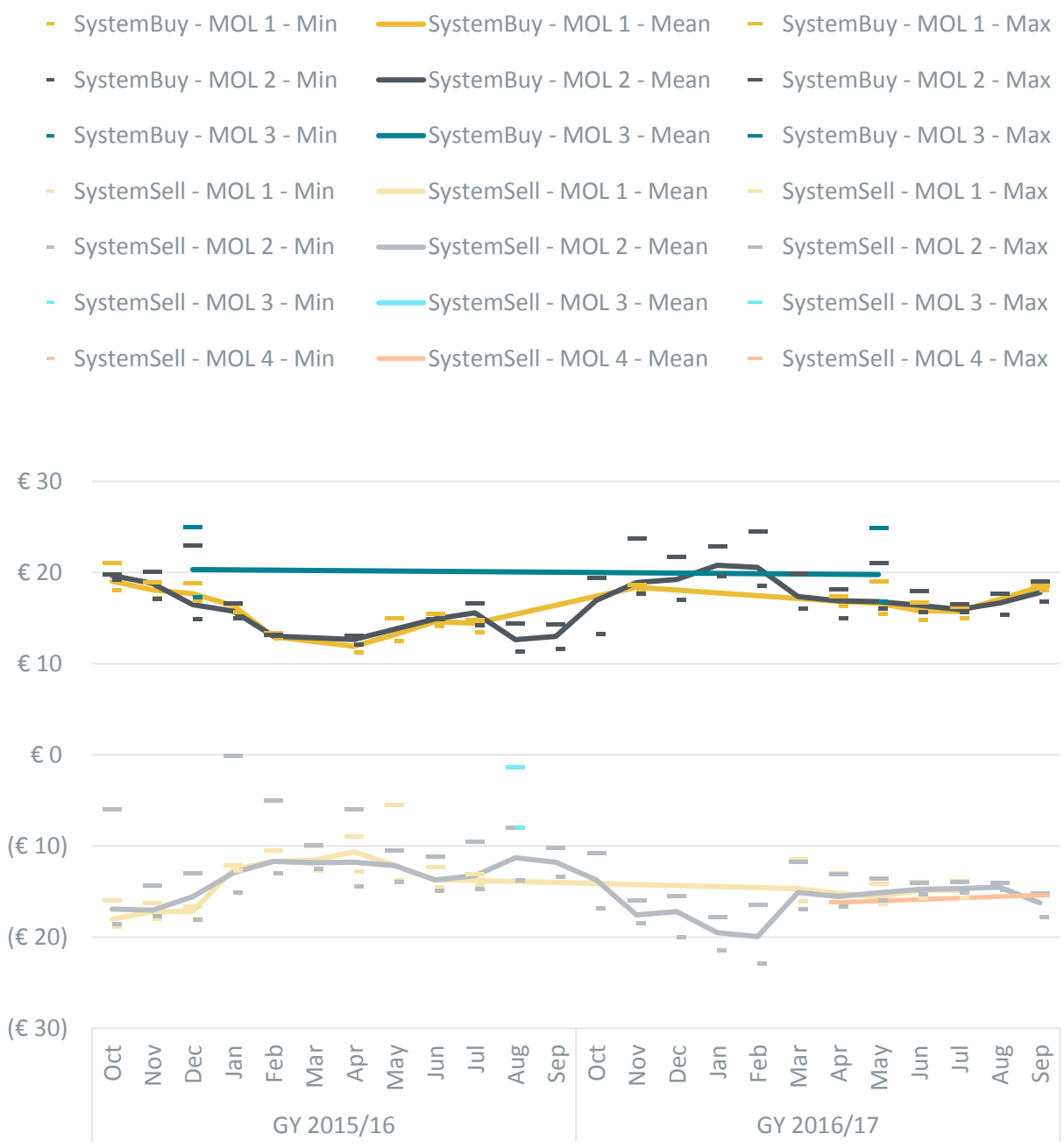

Figure 9: External balancing actions – prices (high CV gas; DA and RoD by MOL and month)

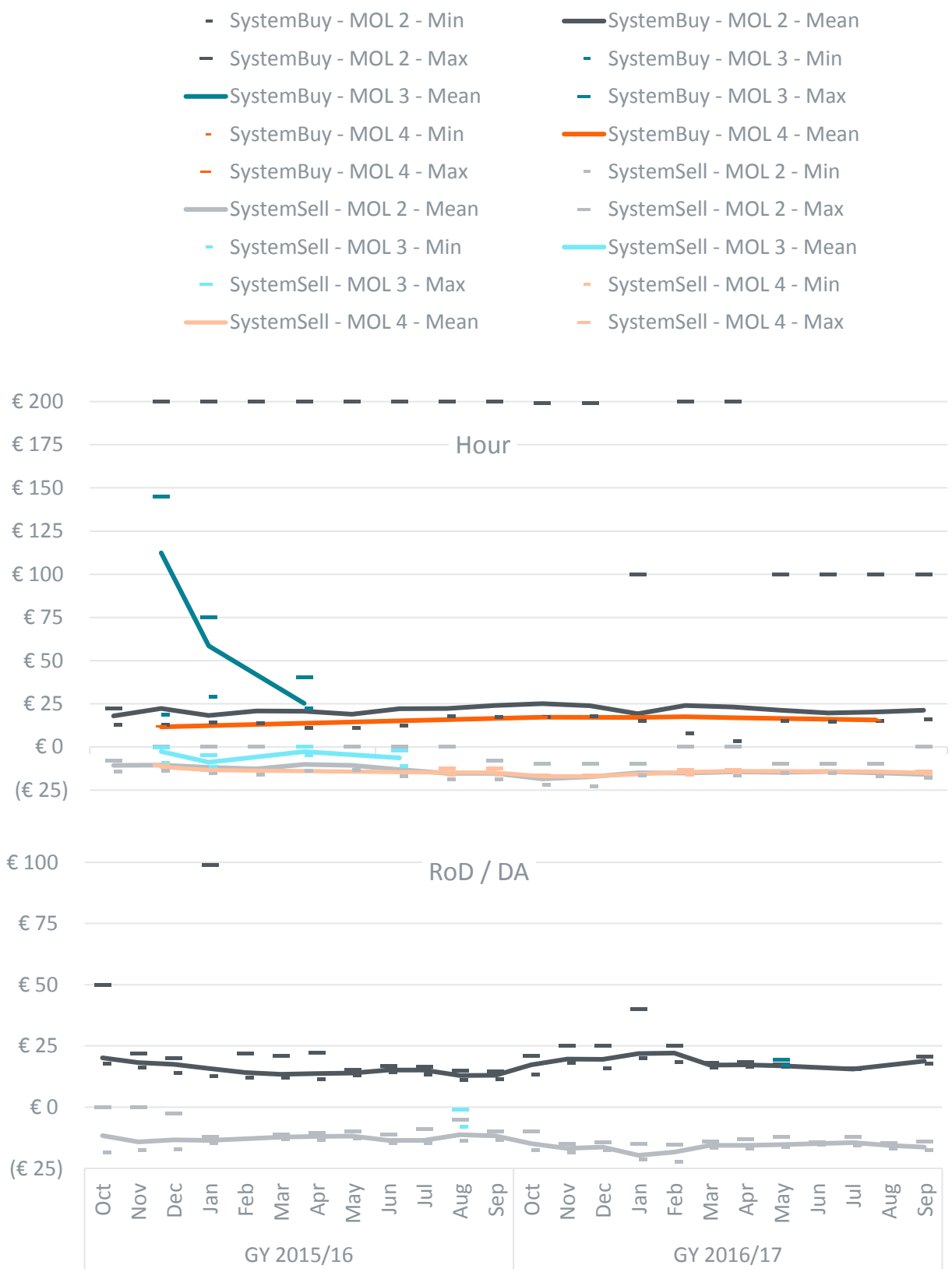

Figure 10: External balancing actions – prices (low CV gas; DA, RoD and Hour by MOL and month)

DEVIATIONS FROM MERIT ORDER

Our external balancing actions and related procurement activities are carried out in accordance with a pre-defined merit order set out in the GaBi Gas 2.0 ruling. In exceptional circumstances, however, the regulatory framework also permits deviations from this merit order. In particular, these include the issuance of test call orders in accordance with the LTO product description (see chapter 5.3). The individual deviations from prescribed merit order ranks that occurred in GY 16/17 are described in Table 3; they are also published on the NCG website[1]. All merit order deviations in GY 16/17 were due to the issuance of LTO test call orders.

Date	MOL affected	MOL used	Reasons for deviation
5 April 2017	MOL 2 - RoD	MOL 4	We issued a test call order instructing a provider to deliver on an LTO (RoD) contract
6 April 2017	MOL 2 - Hour	MOL 4	We issued a test call order instructing a provider to deliver on an LTO (Hour) contract
21 August 2017	MOL 2 - Hour	MOL 4	We issued a test call order instructing a provider to deliver on an LTO (Hour) contract
23 August 2017	MOL 2 - Hour	MOL 4	We issued a test call order instructing a provider to deliver on an LTO (Hour) contract
28 September 2017	MOL 2 - RoD	MOL 4	We issued a test call order instructing a provider to deliver on an LTO (RoD) contract

Table 3: Overview of deviations from merit order

[1] https://www.net-connect-germany.de/en-gb/Information/Balancing-Gas-Supplier/Publications/Merit-Order-Exceptions

3.2. Procurement of gas for balancing purposes in adjacent market areas

Procurement of gas for balancing purposes in adjacent market areas (according to Article 9(3) of the BAL Code)

The option to procure gas for balancing purposes in adjacent market areas provides an appropriate way for us to balance our market area because it allows us to provide a targeted response, whether globally across our market area, in a specific gas quality and/or in a specific balancing zone or (in certain hours) at a specific system point by trading title products for delivery at the TTF. We achieve this response by booking the required transportation capacity and nominating the corresponding flows at the relevant IPs. In this way the option to procure gas for balancing purposes in adjacent market areas represents a suitable additional balancing tool complementing the product portfolio available for balancing actions in our own market area NetConnect Germany.

Under section 6(b)(bb) of the operative provisions of the GaBi Gas 2.0 ruling the MAMs have been given permission to procure gas for balancing purposes in adjacent market areas. This allows NCG to trade spot contracts for delivery at the Dutch TTF on PEGAS or ICE Endex.

Quantities supplied/received and associated costs

Figure 11 shows the SystemBuy and SystemSell balancing quantities we traded for TTF delivery in GY 15/16 and GY 16/17 to meet our balancing requirements in the low CV network areas of our market area along with the associated costs and revenues (unadjusted costs/revenues not including transportation markups or markdowns) on a monthly basis. Owing to high liquidity in the corresponding PEGAS order books traded for delivery in our own market area (global, quality-specific and point-specific hourly order books), we have been able to fully meet our low CV gas balancing requirements from within our own market area since April 2016.

Contracted transportation capacity and capacity utilisation

Figure 12 shows the costs by month incurred in GY 15/16 and GY 16/17 for transportation capacity booked by NCG for transports to the Netherlands (Exit NCG) and for transports to the market area NetConnect Germany (Entry NCG). Actual daily utilisation of these capacity holdings is shown for both gas years in Figure 13. Thanks to the introduction of short-term capacity products (DA and RoD) at the relevant IPs, NCG has not had to book capacity on a long-term basis since April 2016. And as was described in the previous paragraph, the liquidity situation was such that no short-term capacity bookings have been necessary, either.

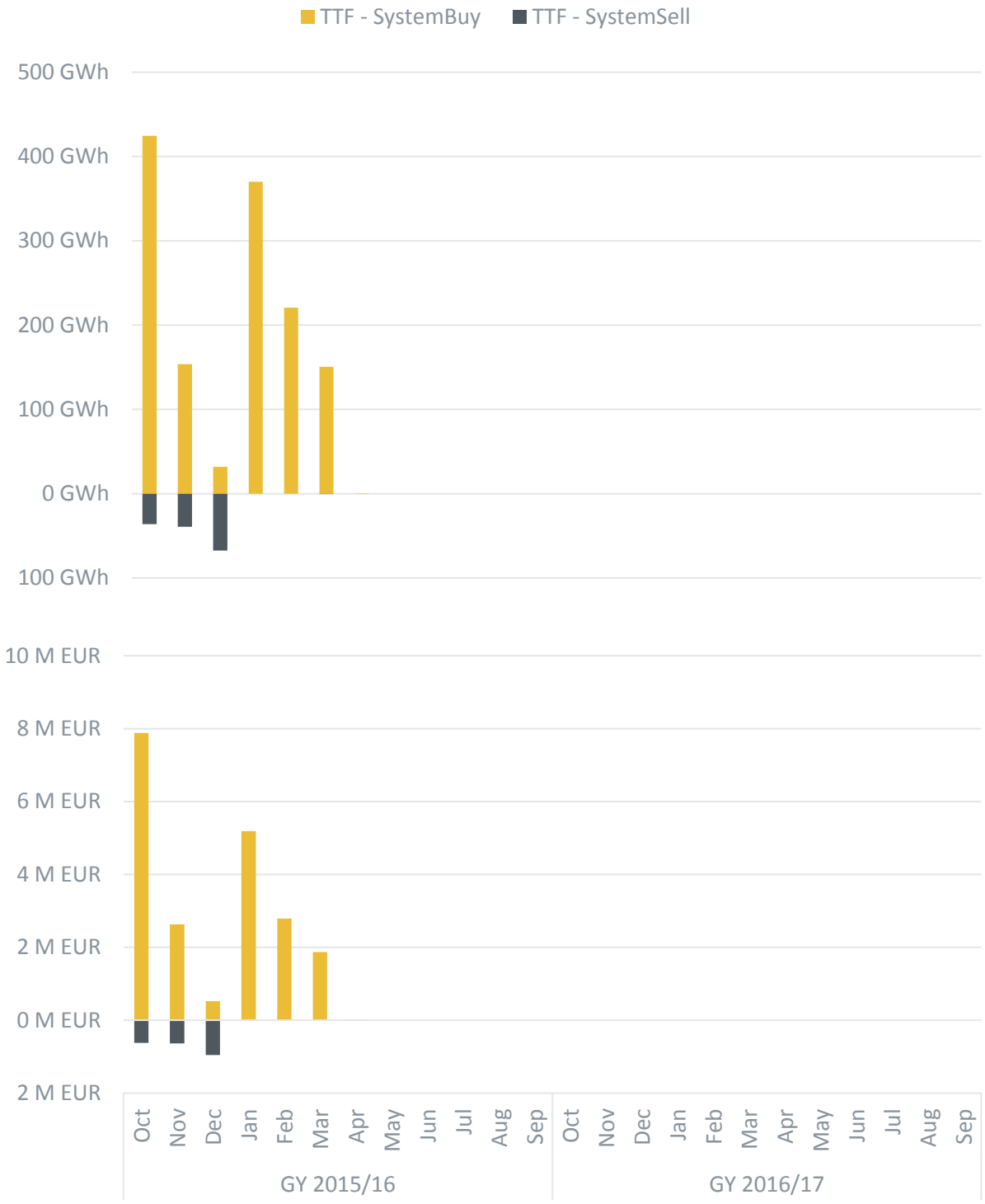

Figure 11: External balancing actions via TTF – quantities and costs/revenues (by month)

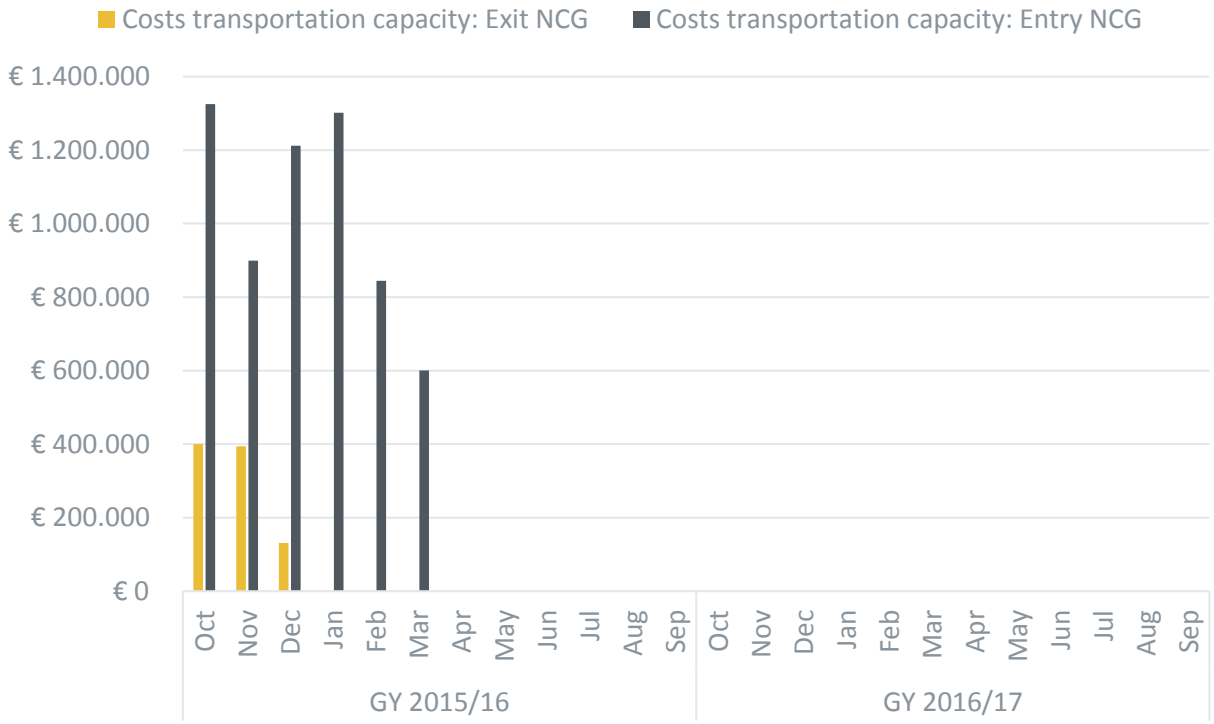

Figure 12: Costs for contracted transportation capacity (by direction and month)

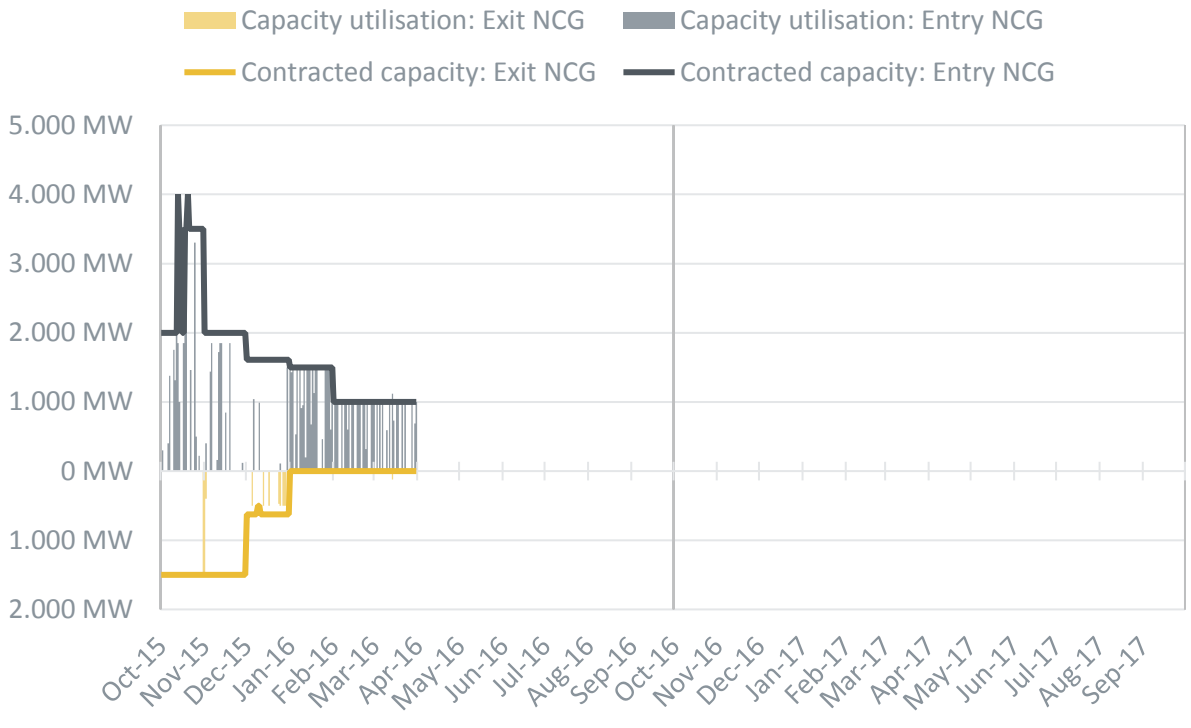

Figure 13: Contracted transportation capacity and capacity utilisation (by direction and day)

Our approach to contracting transportation capacity

As required under sentence 3 of Article 9(3) of the BAL Code, NCG reconsiders the terms and conditions applicable to the trading of title products at the TTF on an annual basis. For this purpose we have reviewed the general terms and conditions applicable to trades in the order books "ICE TTF" and "PEGAS TTF" as well as the relevant transportation contracts governing our corresponding gas transports/nominations from a legal and regulatory perspective, and have found them to be in order. In addition, we have reviewed whether the conditions for procuring gas in adjacent market areas are still met. In our view the availability of this option is still necessary and appropriate. The requirements set out in sentence 3 of article 9(3) of the BAL Code are therefore satisfied.

We evaluate the applicable terms and price components relevant to our balancing-related procurement activities in adjacent market areas on an annual basis and where necessary adjust our procurement approach to reflect any changes in circumstances. Since April 2016 we have been able to book capacity on a short-term basis (WD and DA) as and when needed. In order to remain compliant with sentence 4 of Article 9(3) of the BAL Code we therefore no longer book capacity on a long-term basis. In so doing we ensure that our balancing actions do not limit network users' access to and use of capacity at the IPs concerned.

Calculation methodology used to calculate transportation markups and markdowns

According to the last sentence of section 6(b)(bb) of the operative provisions of the GaBi Gas 2.0 ruling, the transportation costs incurred for the receipt or supply of gas from or to an adjacent market area shall be appropriately taken into account by the MAM. The resulting transportation markups and markdowns are included in the MAM's calculations in addition to the commodity costs or revenues incurred or generated in the adjacent market area when determining the applicable positive and negative daily imbalance prices.

From October 2015 to March 2017 we calculated our transportation markups and markdowns based on actual utilisation of our transportation capacity holdings in the relevant reference period of the previous year. Due to sufficient liquidity in our own market area, however, we did not have to procure gas for balancing purposes via the TTF after April 2016 (see chapter 3.2). So for the periods from April 2017 forward, we were no longer able to follow our previous approach and base our calculations on actual capacity utilisation in the period from April 2016, as the average utilisation period in this period was "zero hours".

For the period from April 2017 to September 2017 we therefore adjusted our transportation markup/markdown calculation methodology to reflect these changed circumstances. We now no longer relied on the corresponding period in the previous year (in this case the summer of 2016) but used the summer of 2015 as reference period instead, as during this time sufficient quantities were transported via the Dutch IPs. On this basis we were then able to calculate transportation markups and markdowns for the 2017 summer months (April to September).

The actual methodology we followed to determine reasonable transportation markups and markdowns in the period from 1 April 2017 to 1 October 2017 is described below:

Calculation and application of transportation markups and markdowns until 1 October 2017

- Separate monthly transportation markups and markdowns were calculated for SystemBuy and SystemSell balancing transactions, respectively.
- For SystemBuy transactions the MAM applied a transportation markup and for SystemSell transactions a transportation markdown, with the applicable markup and markdown being added to and deducted from the price payable in respect of the relevant exchange trade.
- The applicable transportation markups and markdowns were calculated according to the following formula:

$$\text{Transportation markup/markdown} = \frac{\text{daily transportation tariff (EUR/MWh/h)}}{\text{Ø utilisation period (h)}}$$

- Calculation of the daily transportation tariff:
  - The calculations were based on the daily capacity tariffs applicable to day-ahead capacity products during the relevant validity period on the Dutch and German sides of the IPs the MAM used for transportation purposes.
  - Where gas transports were effected via more than one IP, the applicable daily tariff for each side of the border was calculated as the arithmetic mean of all daily tariffs payable on that side of the border.
  - The daily capacity tariffs thus calculated were then added together for both sides of the border.
- Determination of the average utilisation period:

$$\text{daily utilisation period} = \frac{\text{total quantity supplied/received on the day (MWh)}}{\text{maximum hourly quantity supplied/received on the day (MWh/h)}}$$

  - For the purpose of calculating the utilisation period only days on which the booked transportation capacity was actually used were taken into account:
  - The average utilisation period was calculated on the basis of the daily utilisation periods thus determined (Ø Einsatzdauer (h): arithmetic mean of the daily utilisation periods), with calculations based on the 2015 summer period (1 April to 30 September 2015).
  - The applicable average utilisation period remained unchanged for the duration of each validity period.

SAMPLE CALCULATION FOR THE DIRECTION SYSTEMBUY FOR A SUMMER MONTH

- Calculation of average utilisation period for summer 2017[2] based on actual utilisation in summer 2015:

Date	(1) quantity received from the adjacent MA [MWh]	(2) maximum hourly quantity received from the adjacent MA [MWh/h]	(3) utilisation period [h] = (1)/(2)
1 April 2015	4,600	460	10
…	…	…	…
30 September 2015	12,000	500	24

Average utilisation period = (10h + … + 24h) / (Σ days on which SystemBuy transactions are effected in adjacent MA)

Assumed average utilisation period for sample calculation = 15h

Average utilisation period applied in summer 2017 remains unchanged throughout entire validity period.

- Calculation of applicable transportation markup:

Daily exit capacity tariff (Netherlands) according to price sheet[3] = 5.00 EUR/MWh/h

Daily entry capacity tariff (Germany, TSO 1) according to price sheet TSO 1[4] = 9.00 EUR/MWh/h

Daily entry capacity tariff (Germany, TSO 2) according to price sheet TSO 2[5] = 11.00 EUR/MWh/h

Arithmetic mean of daily entry capacity tariffs (Germany, TSO 1 and TSO 2) = 10.00 EUR/MWh/h

Sum of daily capacity tariffs (Germany, Netherlands) = 15.00 EUR/MWh/h

Transportation markup = (15.00 EUR/MWh/h)/(15h) = 1.00 EUR/MWh

- When gas was purchased in the adjacent market area for balancing purposes in the relevant summer month a markup of 1.00 EUR/MWh was added to the price payable in respect of the relevant exchange transaction and was thus taken into account in determining the applicable imbalance price. The markup remained unchanged throughout the month and only changed if and when the underlying daily capacity tariffs changed.

[2] Sample calculation based on fictitious data.
[3] The tariff is calculated taking into account the multipliers and/or seasonal factors applied by GTS.
[4] In this calculation the price multipliers for daily capacity bookings determined in the administrative ruling on transmission capacity tariffs issued by the Federal Network Agency (so-called "BEATE" decision) must be factored in.
[5] See footnote No. 3.

Adjustments to the calculation methodology used to calculate transportation markups and markdowns

Since October 2017 we have been calculating transportation markups and markdowns based on the actual number of hours in which we use the booked transportation capacity in each case (factoring in the number of hours remaining until the end of the gas day, which may vary between 1 to 24 hours). The transportation markups and markdowns corresponding to all possible durations (= utilisation periods) are published on the NCG website.

This approach is illustrated in the example below.

Calculation and application of transportation markups and markdowns since 1 October 2017

- Separate monthly transportation markups and markdowns are calculated for SystemBuy and SystemSell balancing transactions, respectively.
- For SystemBuy transactions the MAM applies a transportation markup and for SystemSell transactions a transportation markdown, with the applicable markup and markdown being added to and deducted from the price payable in respect of the relevant exchange trade.
- The applicable transportation markups and markdowns are calculated according to the following formula:

$$\text{Transportation markup/markdown} = \frac{\text{transportation tariff (EUR/MWh/h)}}{\text{utilisation period (h)}}$$

- Calculation of the transportation tariff:
  - The calculations are based on the daily capacity tariffs applicable to day-ahead capacity products during the relevant validity period on the Dutch and German sides of the IPs the MAM uses for transportation purposes.
  - Where gas transports are effected via more than one IP, the applicable daily tariff for each side of the border is calculated as the arithmetic mean of all daily tariffs payable on that side of the border.
  - On the German side of the border the full average daily capacity tariffs are taken into account, irrespective of the duration of the corresponding utilisation period. On the Dutch side of the border the applicable daily capacity tariffs are taken into account on a pro-rata basis, based on actual utilisation.
  - The transportation tariffs thus calculated are then added together for both sides of the border.
  - The formula has the following components:

$$\text{Transportation tariff} = \text{Ø daily capacity tariff NCG (EUR/MWh/h/d)} + \left(\frac{\text{Ø daily capacity tariff GTS (EUR/MWh/h)}}{24\text{h}}\right) * \text{utilisation period (h)}$$

SAMPLE CALCULATION FOR DETERMINING UTILISATION PERIODS AND TRANSPORTATION MARKUPS FOR THE DIRECTION SYSTEMBUY:

- Calculation of utilisation period:

  SystemBuy transaction is effected at 08:00, delivery to commence at 11:00

  Gas is delivered from 11:00 to 06:00.

  → utilisation period = 19h.

- Calculation of applicable transportation markup:

  Daily entry capacity tariff according to price sheet TSO 1[6]:

  Germany, TSO 1 = 12.00 EUR/MWh/h/d
  Germany, TSO 2 = 8.00 EUR/MWh/h/d
  Ø daily entry capacity tariff (Germany) = 10.00 EUR/MWh/h/d

  In determining the applicable daily capacity tariffs on the German side of the border actual capacity utilisation is not taken into account.

  Daily exit capacity tariff (Netherlands) according to price sheet[7]:

  IP 1: 5.00 EUR/MWh/h/d
  IP 2: 6.00 EUR/MWh/h/d
  Ø daily exit capacity tariff (Netherlands): 5.50 EUR/MWh/h/d

  The tariffs on the Dutch side of the border depend on the actual duration of utilisation.

  Transportation tariff = 10.00 EUR/MWh/h/d + 5.50 EUR/MWh/h/d / 24h * 19h
  = 14.35 EUR/MWh/h/utilisation period

  Transportation markup = 14.35 EUR/MWh/h/19h = 0.76 EUR/MWh

  When gas is purchased in the adjacent market area for balancing purposes the markup of 0.76 EUR/MWh is added to the price payable in respect of the relevant exchange transaction and is thus taken into account in determining the applicable imbalance price. The markup determined for each utilisation period (duration) remains unchanged unless and until the corresponding daily capacity tariffs change.

[6] In this calculation the price multipliers for daily capacity bookings determined in the administrative ruling on transmission capacity tariffs issued by the Federal Network Agency (so-called "BEATE" decision) must be factored in.
[7] The tariff is calculated taking into account the multipliers and/or seasonal factors applied by GTS.

3.3. NUMBER OF TRADES EXECUTED FOR BALANCING PURPOSES

Below we provide an overview of our monthly trading activities for balancing purposes (in accordance with Article 9(4) of the BAL Code) in GY 15/16 and GY 16/17 by merit order rank. In relation to our MOL 2 balancing actions separate information is provided for trades effected in our own market area and trades effected in adjacent market areas, respectively.

Please note: Since April 2016 we have been procuring gas for point-specific balancing actions at the IPs Elten/Zevenaar and Vreden/Winterswijk by trading the corresponding products on the exchange or contracting commodity-based balancing products bilaterally. In this context we discontinued our previous balancing product "Flexibility", which had been based on capacity charges only and had been used to structure gas flows in the low CV gas sector. As our trading activities picked up notably as a result of this, we show the corresponding information in Figure 14 as "Hour – SystemBuy" and "Hour – SystemSell", respectively, without breaking it down by merit order rank to achieve greater clarity.

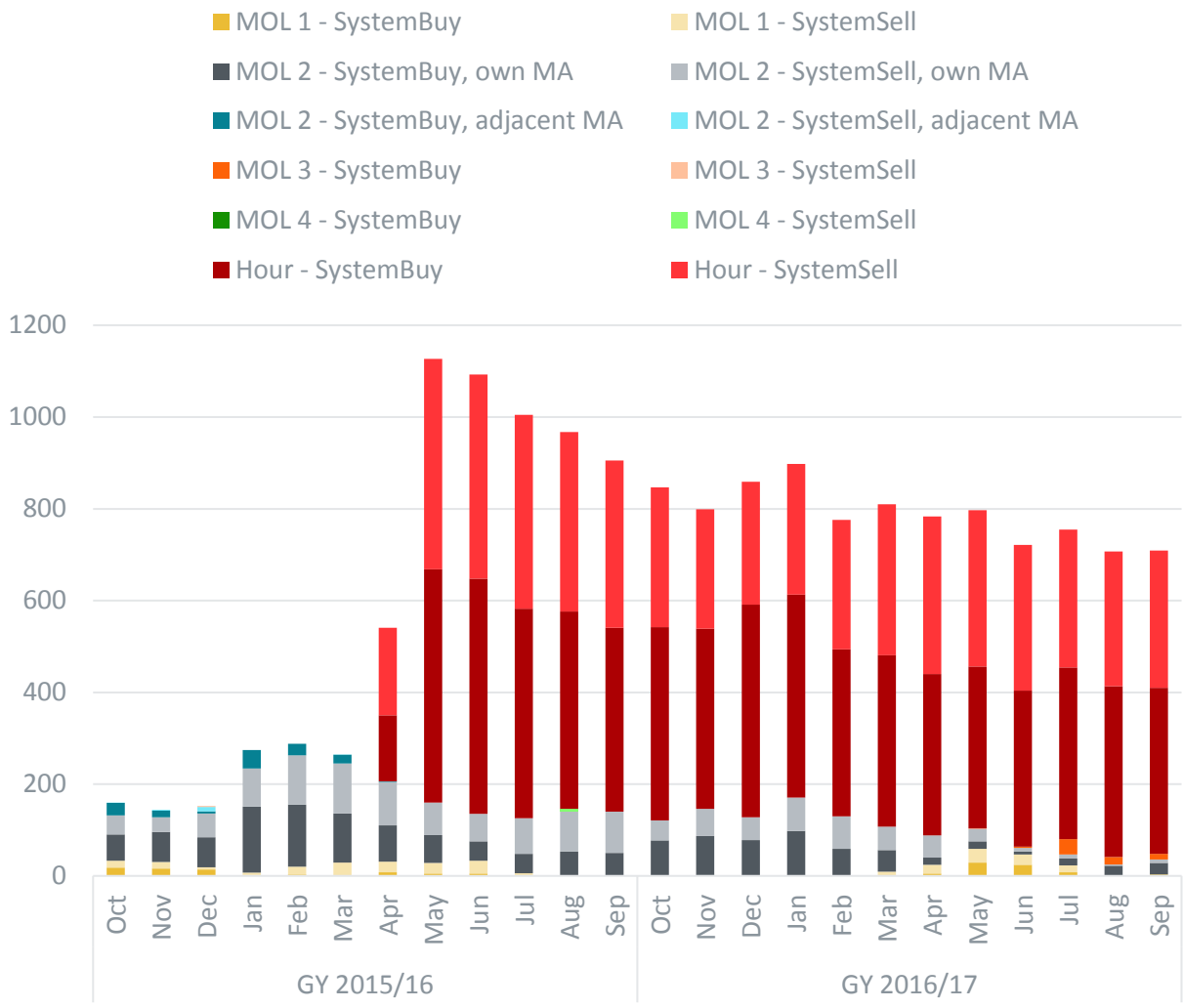

Figure 14: Number of trades (RoD, DA and Hour by month)

Our approach to determining the number of trades executed for balancing purposes

We have determined the number of trades NCG executed to meet its balancing requirements separately for each hour of each gas day based on defined balancing criteria. Where several trades were entered into for the same term in response to the same balancing criterion, these are shown as a single trade. Where several trades were entered into for the same hour but in response to different balancing criteria, these are treated as individual trades. The trades thus determined are then summed up over the relevant period of analysis.

The following balancing criteria are used by NCG:

- MOL 1: Global balancing requirement, SystemBuy, delivery of gas at the NCG VTP
- MOL 1: Global balancing requirement, SystemSell, delivery of gas at the NCG VTP
- MOL 2: Quality-specific/zone-specific balancing requirement, SystemBuy, delivery of gas at the NCG VTP (high CV gas/low CV gas)
- MOL 2: Quality-specific/zone-specific balancing requirement, SystemSell, delivery of gas at the NCG VTP (high CV gas/low CV gas)
- MOL 2: Quality-specific/zone-specific balancing requirement, SystemBuy, delivery of gas at the TTF (VTP)
- MOL 2: Quality-specific/zone-specific balancing requirement, SystemSell, delivery of gas at the TTF (VTP)
- MOL 3: Point-specific balancing requirement, SystemBuy, delivery of gas at the NCG VTP (high CV gas/low CV gas)
- MOL 3: Point-specific balancing requirement, SystemSell, delivery of gas at the NCG VTP (high CV gas/low CV gas)
- MOL 4: Zone-specific balancing requirement, SystemBuy, delivery of gas at the NCG VTP (high CV gas/low CV gas)
- MOL 4: Zone-specific balancing requirement, SystemSell, delivery of gas at the NCG VTP (high CV gas/low CV gas)
- Point-specific hourly balancing requirement, SystemBuy, delivery of gas at the NCG VTP (low CV gas)
- Point-specific hourly balancing requirement, SystemSell, delivery of gas at the NCG VTP (low CV gas)

4. EFFECT AND APPLICATION OF WITHIN-DAY OBLIGATION RULES

In this chapter we address the effect of the switch from the within-day incentive regime based on so-called "structuring charges" in place under the former GABi Gas decision to the "within-day obligation" regime introduced by the GaBi Gas 2.0 ruling. We start by describing how this has affected the extent to which we have to take within-day balancing actions in opposite directions. Following this, we analyse whether the new tolerance calculation rules have affected BGMs' choice of allocation regime for the "RLM" exit points registered to their balancing groups ("RLM" exit points are those exit points that are equipped with a supply meter installation which records hourly consumption; they are metered on an intraday basis). For if a large proportion of RLM exit points is assigned to the "RLMmT" allocation group (which have a flat allocation profile, i.e. measured daily offtakes are divided by 24 for energy balancing purposes), this may impact our within-day balancing requirements given that shippers and BGMs are likely to structure their gas deliveries to the market area so that they reflect allocated offtakes as closely as possible. We conclude this chapter by describing the development of BGMs' within-day flexibility quantities for the two gas years covered by this report based on an as-if analysis.

4.1. WITHIN-DAY BALANCING ACTIONS IN OPPOSITE DIRECTIONS

On 1 October 2016 the within-day obligation regime as set out in the GaBi Gas 2.0 decision replaced the old within-day incentive mechanism based on structuring charges in place under the former GABi Gas ruling. A comparison between the two gas years covered by this report shows that in GY 16/17 our balancing actions in opposite directions – by this we mean gas days on which we have had to act on both sides of the market by both buying and selling gas for balancing purposes – increased on GY 15/16 (based on an analysis of opposing balancing actions carried out within MOL 1 as well as opposing balancing actions carried out for each gas quality within MOL 2 using quality-specific products).

Figure 15 shows the scale of our within-day balancing actions in GY 15/16 and GY 16/17 that were carried out in opposite directions on a RoD basis by merit order rank.

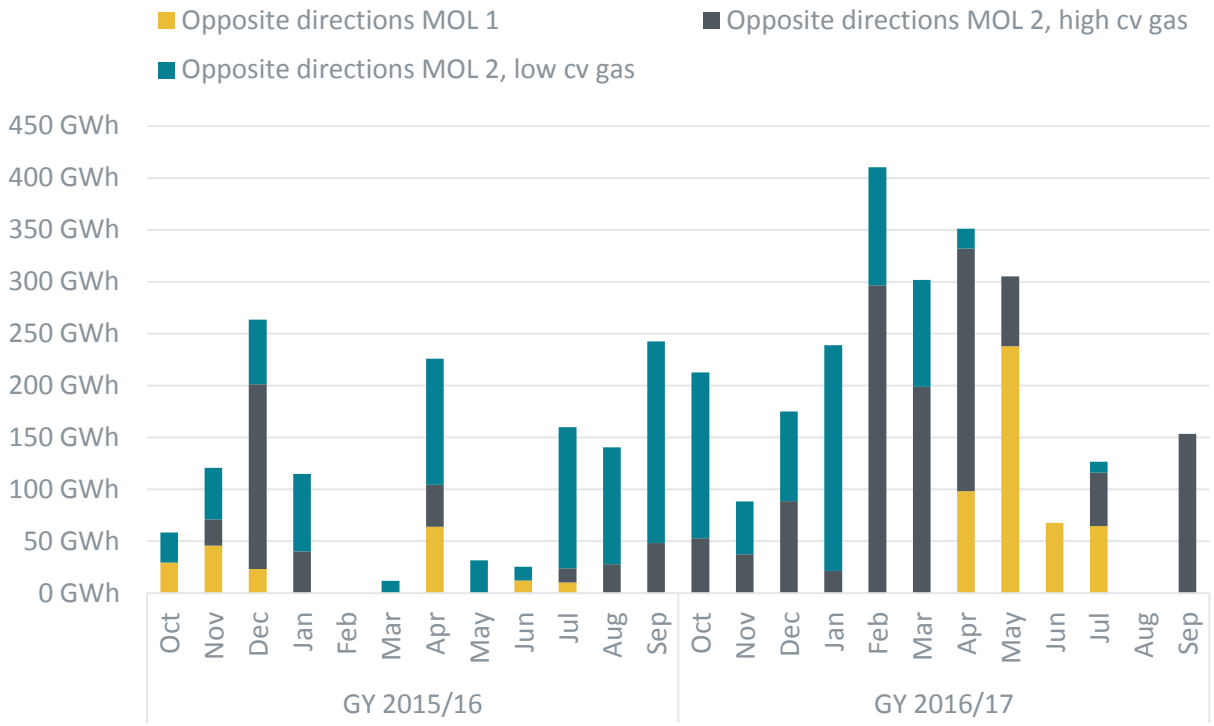

Figure 15: Within-day balancing actions in opposite directions (RoD by month)

4.2. Analysis of changes in allocation group selection (RLMmT/RLMoT)

Under the current rules applicable since 1 October 2016 BGMs are granted a tolerance on their RLM offtakes which is calculated as a percentage (± 7.5%) of daily RLM offtake allocations and applies equally in each hour of the gas day, irrespective of whether the RLM exit points registered to a BGM's balancing group have been assigned to the RLMmT (flat allocation profile) or RLMoT (structured allocation profile, hourly offtakes are allocated as measured) allocation group. The tolerances granted under the former incentive mechanism ("structuring charges" as defined in the 2008 GABi Gas ruling) were calculated based on hourly RLM quantities and varied by allocation group. So the tolerance level available was a factor for BGMs in deciding which allocation group to choose.

Under the GaBi Gas 2.0 rules, all RLM exit points are by default assigned to the allocation group RLMmT – only if a BGM requests otherwise will an exit point be assigned to the allocation group RLMoT. The additional allocation group "RLMNEV" (used in relation to RLM exit points that are part of alternative flow management arrangements other than the usual nomination process, i.e. where the corresponding inputs are controlled by means of a dedicated flexible supply source that is managed based on online meter readings) was discontinued effective 1 October 2016. Since then all RLM exit points must be assigned to either of the two remaining RLM allocation groups.

Figure 16 shows the offtake quantities allocated to RLM exit points in GY 15/16 and GY 16/17 by allocation group. In GY 16/17 the share of RLMoT allocations went down to 5%, compared with 8% in GY 15/16. Offtakes at RLMNEV exit points, which are now no longer allocated separately, accounted for only 0.004% of RLM allocations in GY 15/16.

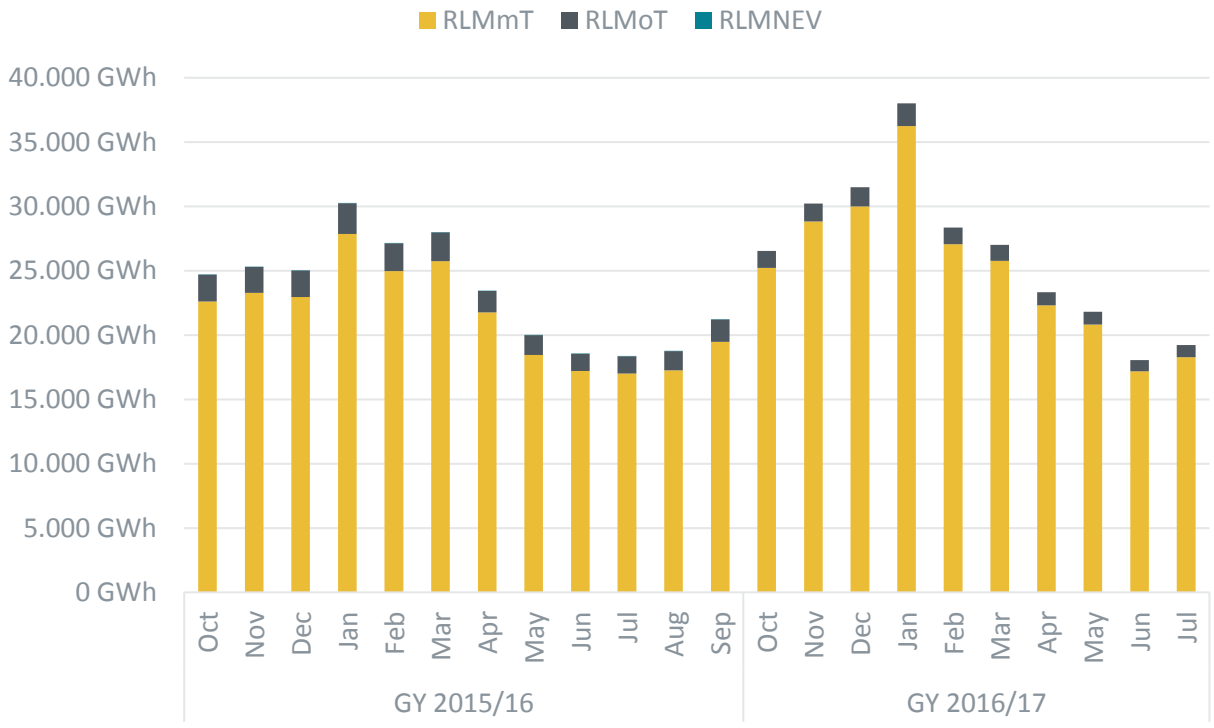

Figure 16: Breakdown of RLM allocations by allocation group (RLMmT vs. RLMoT)

4.3. Development of BGMs' within-day flexibility quantities

The "within-day flexibility quantity" represents the daily sum of the cumulative hourly imbalances outside the applicable tolerance limits as they have been determined for a balancing group. On this quantity the MAM levies a "within-day flexibility charge", which is determined based on the average price difference between the corresponding balancing transactions effected in opposite directions within MOL 1 on the gas day in question.

In November 2016, one month after the within-day obligation rules were introduced, we found that BGMs' within-day flexibility quantities had increased notably. Due to the fact that at the start of GY 16/17 our balancing requirements were largely quality-specific in nature and we were thus primarily using MOL 2 contracts to take balancing actions instead of MOL 1, our balancing activities at the time did not result in within-day flexibility charges greater than 0 EUR/MWh. As a result, the corresponding within-day flexibility quantities were charged to BGMs at a within-day flexibility charge of 0 EUR/MWh. The first month to result in within-day flexibility charges greater than 0 EUR/MWh and corresponding costs to the BGMs affected was April 2017, when within-day flexibility charges were applied on five gas days. At the same time, BGMs' within-day flexibility quantities decreased temporarily in April and May 2017. Whether we will see a continuation of this trend and how it may evolve is hard to tell at present as the final allocations for the months August and September are not yet available at the time of publication of this report.

Figure 17 shows the aggregate within-day flexibility quantities determined for each month in GY 16/17 along with the within-day flexibility quantities as they would have resulted in GY 15/16 (as-if analysis). Figure 18 shows the corresponding within-day flexibility charges > 0 EUR/MWh in each month.

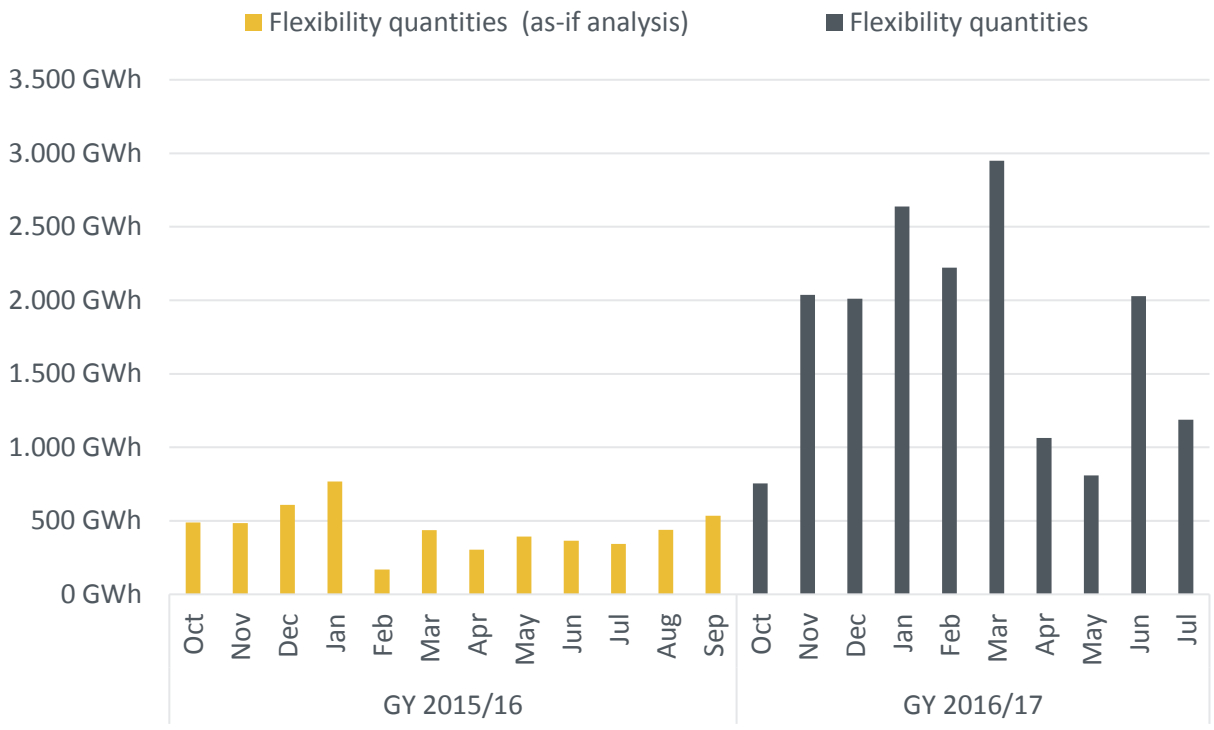

Figure 17: Aggregate within-day flexibility quantities (by month)

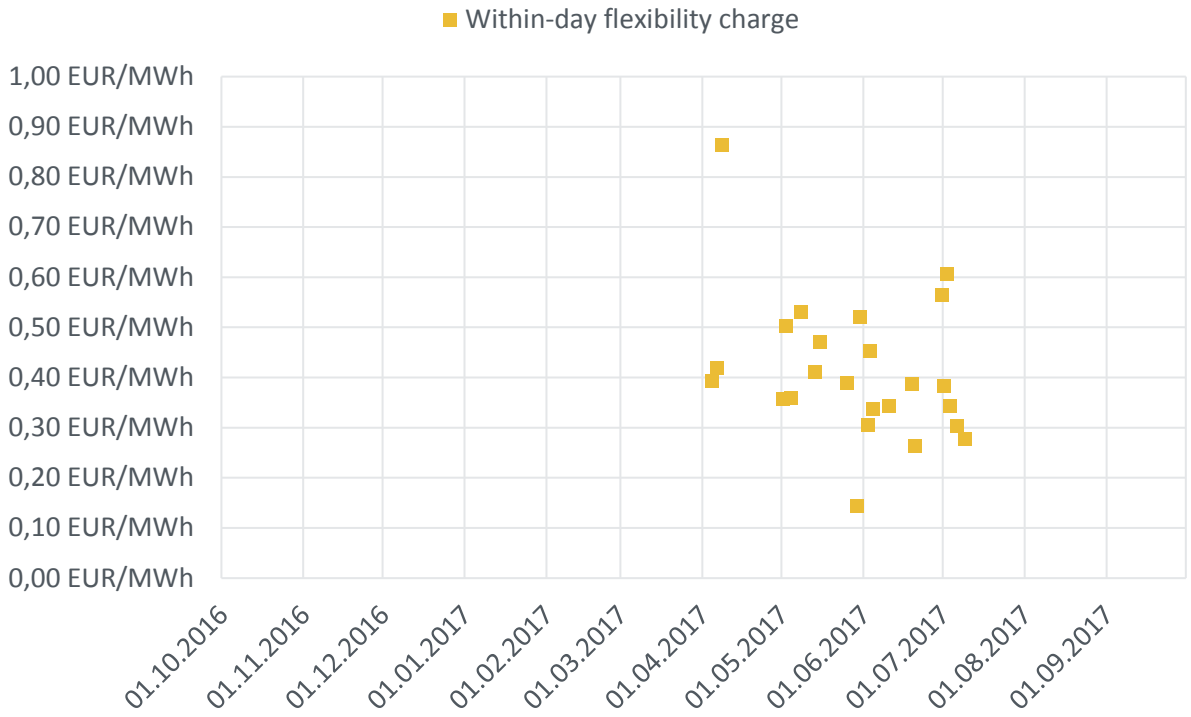

Figure 18: Applicable within-day flexibility charges (by day)

The within-day flexibility rules, under which BGMs are to pay unpredictable, cost-reflective within-day flexibility charges based on their within-day flexibility quantities, are to provide an incentive for BGMs to keep their hourly imbalances as small as possible. As the within-day obligation rules have only been in force for a short time, their effect on BGMs' within-day flexibility quantities and on the scale of our within-day balancing actions in opposite directions still needs to be monitored in future.

5. USE OF BALANCING SERVICES (MOL 4)

5.1. LONG-TERM OPTIONS (PRODUCT VARIANTS "ROD", "DA")

PRODUCT DESCRIPTION

Where the bilateral balancing product "Commodity" is procured on a long-term basis, it takes the form of so-called Long-Term Options (LTO), which are contracted bilaterally in advance and award NCG the right to buy or sell (as the case may be) gas to or from the relevant provider at any time throughout the agreed contract period. LTO contracts for the product variants RoD and DA are procured to provide a buffer against so-called "dynamic effects" in the balancing zones for which they are contracted as well as to increase supply security as required under the BMWi policy paper (see chapter 6). "Dynamic effects" is the term we use to refer to situations where special external circumstances make it necessary for pipeline inventory changes to be effected at short notice in a specific balancing zone.

Where an LTO is contracted on a "RoD" basis, the relevant provider has an obligation to supply or receive a specified gas quantity at a constant hourly rate on a specified gas day on receiving an instruction to this effect from NCG (this instruction is referred to as a "call order"), starting from the hour stated in the call order up until the end of the relevant gas day. Except where a call order relates to the last hour of a gas day only, the product variant "RoD" does not involve the supply or receipt of gas during specified individual hours of a gas day. Where an LTO is contracted on a "DA" basis, the relevant provider has an obligation to supply or receive a specified gas quantity at a constant hourly rate throughout the entire next gas day on receiving a call order from NCG. Call orders for both of these product variants are issued at least three hours before the hour from which the instructed gas quantity is to be supplied or received ("call lead time").

NCG conducts transparent tender processes in the course of which it invites bids for the relevant balancing zones. The gas requirements to be tendered out in each case are published beforehand as required under the GaBi Gas 2.0 ruling and the BAL Code. Each LTO provider may specify a capacity charge that will be applied throughout the relevant contract period so as to remunerate them for procuring their availability to supply or receive gas from or to NCG. NCG pays these capacity charges to providers irrespective of whether any call orders are actually issued on their contracts or not. Whenever a call order is issued on a contracted LTO, NCG makes a payment to the relevant provider where gas is supplied by the provider or receives a payment from the provider where gas is received by the provider. These payments are determined by multiplying the instructed gas quantities supplied or received by the provider (as the case may be) by the commodity charge in EUR per MWh previously quoted by the provider in its corresponding bid, which remains unchanged throughout the agreed contract period. The individual specifications for the LTO product are provided in Table 4.

Bids for LTO contracts may be submitted by all BGMs who have successfully completed the prequalification process and are thus eligible to participate in our bilateral balancing market.

Both the bid submission and contract award processes are conducted through the bilateral bidding platform operated by NCG.

Table 5 shows the costs we incurred under our MOL 4 contracts. The number of days on which we used the contracted MOL 4 balancing services is shown in Table 6.

LTO parameter	Specifications
Product variant	Rest-of-the-Day (RoD), Day-Ahead (DA)
Product category	Zone-specific
Bid delivery rate	10 MWh/h per lot
Point of delivery	Point(s) located within relevant balancing zone as specified in invitation to tender: HN (high CV North), HM (high CV Central), HS (high CV South), LW (low CV West), LO (low CV East)
Pricing	Capacity charge and commodity charge
Required service availability	Every gas day throughout the agreed contract period
Call lead time	3 hours

Table 4: LTO product specifications (RoD/DA)

	GY 2015/16		GY 2016/17	
	SystemBuy	SystemSell	SystemBuy	SystemSell
LTO RoD	**€6,008,637.41**	**€1,572,325.68**	**€5,405,977.42**	**€994,097.14**
Zone-specific	€6,008,637.41	€1,572,325.68	€3,242,454.42	€994,097.14
Storage points			€2,163,523.00	
LTO Hour	**€8,074,376.70**	**€5,489,428.42**	**€16,497,597.65**	**€10,421,300.85**
Winterswijk/Vreden	€2,151,109.36	€1,454,207.08	€3,939,477.50	€2,806,704.70
Zevenaar/Elten	€5,923,267.34	€4,035,221.34	€12,558,120.15	€7,614,596.15
Flexibility	**€42,190,594.00**			
Winterswijk/Vreden	€10,208,427.00			
Zevenaar/Elten	€31,982,167.00			

Table 5: Costs under MOL 4 contracts

MOL 4	GY 2015/16		GY 2016/17	
	SystemBuy	SystemSell	SystemBuy	SystemSell
Call days	3	4	5	11

Table 6: Number of days on which MOL 4 balancing services were used

TENDER CONTRACT PERIODS AND TENDER RESULTS

Below we provide an overview of our balancing requirements in each balancing zone in each relevant contract period for which we invited LTO bids on a RoD[8] basis along with the results of the corresponding tender processes. The significantly increased SystemBuy reserve requirements in the months from December 2016 up to and including March 2017 result from the supply security measures called for in the BMWi policy paper and the supplemental tendering exercise for contracts for delivery at storage connection points in the HS balancing zone conducted during this time (see chapter 6).

Contract period	Required (MWh/h)	Offered (MWh/h)	Contracted (MWh/h)	Capacity charges[9] (EUR)	Ø Commodity charges (EUR/MWh)
Oct/Nov 2016	3,810	14,930	3,810	€391,433	€11.98
Dec 2016	9,970	35,340	9,970	€608,174	€18.35
Jan 2017	9,960	36,700	9,960	€612,590	€18.44
Feb 2017	9,960	34,520	9,960	€670,734	€18.48
15 to 28 Feb 2017[10]	4,000	4,350	4,000	€2,163,523	€23.20
Mar 2017	9,960	34,170	9,960	€959,523	€18.23
Q2 2017	-	-	-	-	-
Q3 2017	-	-	-	-	-

Table 7: SystemBuy LTO (summary, all balancing zones) [11]

Contract period	Required (MWh/h)	Offered (MWh/h)	Contracted (MWh/h)	Capacity charges (EUR)	Ø Commodity charges (EUR/MWh)
Oct/Nov 2016	2,400	7,810	2,400	€257,691	€12.04
Dec 2016	4,850	16,410	4,850	€261,013	€18.19
Jan 2017	4,850	17,440	4,850	€261,013	€18.29
Feb 2017	4,850	16,090	4,850	€248,708	€18.35
15 to 28 Feb 2017	4,000	4,350	4,000	€2,163,523	€23.20
Mar 2017	4,850	15,590	4,850	€260,882	€18.14
Q2 2017	-	-	-	-	-
Q3 2017	-	-	-	-	-

Table 8: SystemBuy LTO (summary, balancing zone: HS)

[8] No bids were invited for the DA product variant.
[9] Information on the capacity charges payable per contracted lot is published on our website (though not at provider level): https://www.net-connect-germany.com
[10] Supplemental LTO tender
[11] No call orders (neither SystemBuy nor SystemSell) were issued on the contracted LTOs in any of the quarters listed, so no commodity charges were paid. For the sake of clarity and given the large number of bids with varying commodity charges we received, we decided not to show the individual commodity charges quoted per lot. The individual commodity charges quoted per contracted lot are published on the NCG website: https://www.net-connect-germany.com.

Contract period	Required (MWh/h)	Offered (MWh/h)	Contracted (MWh/h)	Capacity charg-es (EUR)	Ø Commodity charges (EUR/MWh)
Oct/Nov 2016	1,410	7,100	1,410	€133,742	€11.87
Dec 2016	1,420	7,590	1,420	€60,721	€18.96
Jan 2017	1,410	7,830	1,410	€59,961	€18.96
Feb 2017	1,410	7,000	1,410	€53,895	€19.08
Mar 2017	1,410	8,400	1,410	€55,464	€19.06
Q2 2017	-	-	-	-	-
Q3 2017	-	-	-	-	-

Table 9: SystemBuy LTO (summary, balancing zone: HN)

Contract period	Required (MWh/h)	Offered (MWh/h)	Contracted (MWh/h)	Capacity charges (EUR)	Ø Commodity charges (EUR/MWh)
Dec 2016	1,250	3,060	1,250	€51,831	€19.15
Jan 2017	1,250	3,260	1,250	€51,831	€19.15
Feb 2017	1,250	3,260	1,250	€46,815	€19.15
Mar 2017	1,250	2,010	1,250	€319,649	€18.11
Q2 2017	-	-	-	-	-
Q3 2017	-	-	-	-	-

Table 10: SystemBuy LTO (summary, balancing zone: HM)

Contract period	Required (MWh/h)	Offered (MWh/h)	Contracted (MWh/h)	Capacity charg-es (EUR)	Ø Commodity charges (EUR/MWh)
Dec 2016	600	1,980	600	€56,034	€17.89
Jan 2017	600	1,980	600	€58,024	€18.08
Feb 2017	600	1,980	600	€77,163	€17.91
Mar 2017	600	2,360	600	€77,012	€17.99
Q2 2017	-	-	-	-	-
Q3 2017	-	-	-	-	-

Table 11: SystemBuy LTO (summary, balancing zone: LO)

Contract period	Required (MWh/h)	Offered (MWh/h)	Contracted (MWh/h)	Capacity charg-es (EUR)	Ø Commodity charges (EUR/MWh)
Dec 2016	1,850	6,300	1,850	€178,576	€17.91
Jan 2017	1,850	6,190	1,850	€181,761	€18.09
Feb 2017	1,850	6,190	1,850	€244,154	€18.10
Mar 2017	1,850	5,810	1,850	€246,516	€18.01
Q2 2017	-	-	-	-	-
Q3 2017	-	-	-	-	-

Table 12: SystemBuy LTO (summary, balancing zone: LW)

Contract period	Required (MWh/h)	Offered (MWh/h)	Contracted (MWh/h)	Capacity charges (EUR)	Ø Commodity charges (EUR/MWh)
Q4 2016	-	-	-	-	-
Q1 2017	-	-	-	-	-
Q2 2017	3,320	15,140	3,320	€480,684	€16.53
Q3 2017	3,030	11,180	3,030	€513,413	€15.22

Table 13: SystemSell LTO (summary, all balancing zones)

Contract period	Required (MWh/h)	Offered (MWh/h)	Contracted (MWh/h)	Capacity charg-es (EUR)	Ø Commodity charges (EUR/MWh)
Q4 2016	-	-	-	-	-
Q1 2017	-	-	-	-	-
Q2 2017	1,960	7,700	1,960	€250,334	€16.83
Q3 2017	1,800	5,790	1,800	€333,417	€15.71

Table 14: SystemSell LTO (summary, balancing zone: HS)

Contract period	Required (MWh/h)	Offered (MWh/h)	Contracted (MWh/h)	Capacity charg-es (EUR)	Ø Commodity charges (EUR/MWh)
Q4 2016	-	-	-	-	-
Q1 2017	-	-	-	-	-
Q2 2017	1,360	7,440	1,360	€230,350	€16.10
Q3 2017	1,230	5,390	1,230	€179,996	€14.49

Table 15: SystemSell LTO (summary, balancing zone: HN)

Frequency of use of Long-Term Options (RoD)

In GY 16/17 we only issued call orders on our RoD LTO contracts to carry out LTO test call orders (see chapter 5.3).

Month	SystemBuy Quantity received [MWh]	SystemBuy Amount [EUR]	SystemSell Quantity supplied [MWh]	SystemSell Amount [EUR]
Apr 2017	-	-	700	€11,333
Sep 2017	-	-	140	€2,156

Table 16: LTO quantities supplied/received (RoD)

Review of options for reducing our use of Long-Term Options (RoD, DA) according to Article 8(6) of the BAL Code

LTOs (RoD, DA) are a zone-specific balancing product and as such serve to ensure availability of gas in all balancing zones on a long-term basis. The required LTO (RoD, DA) reserves to be put out to tender are determined on the basis of the scope of the expected dynamic effects in the relevant balancing zones, on the one hand, and on the basis of the measures to improve supply security set out by the BMWi in its policy paper of 16 December 2015, on the other hand. Especially in view of the BMWi's call for a strengthening of the balancing market by way of increasing the contract volumes of long-term balancing products it is not likely that we will be able to reduce the contract volumes of our long-term (RoD) balancing products ranking at MOL 4 in the future.

5.2. Long-Term Options (product variant "Hour")

Product description

Hourly LTOs (product variant "Hour") are a long-term sub-category of our bilateral balancing product "Commodity" and award NCG the right to buy or sell (as the case may be) gas to or from the relevant provider in any specified individual hour throughout the agreed contract period. Call orders for this balancing product are subject to a call lead time of at least three hours. The tendering and pricing rules for LTOs contracted on a RoD and DA basis (see chapter 5.1) apply accordingly to LTOs contracted on an hourly basis.

The individual specifications for the "Hour" product variant of the LTO product are provided in Table 17:

LTO parameter	Specifications
Product variant	Hour
Product category	Point-specific
Bid delivery rate	10 MWh/h per lot
Point of delivery	Specified system point, as stated in the relevant invitation to tender: IP Elten/Zevenaar, IP Vreden/Winterswijk
Pricing	Capacity charge and commodity charge
Required service availability	Every hour throughout the agreed contract period
Call lead time	3 hours

Table 17: LTO product specifications (Hour)

Tender contract periods and tender results

Below we provide an overview of the hourly balancing requirements at each relevant IP in each relevant contract period along with the results of the corresponding tender processes.

Contract period	Required (MWh/h)	Offered (MWh/h)	Contracted (MWh/h)	Capacity costs[12] (EUR)	Ø Commodity charges (EUR/MWh)
Q4 2016	1,050	4,900	1,050	€1,154,243	€11.93
Q1 2017	1,050	3,100	1,050	€858,531	€17.39
Q2 2017	1,050	3,700	1,050	€906,852	€16.93
Q3 2017	1,050	2,350	1,050	€1,019,852	€15.74

Table 18: SystemBuy Vreden/Winterswijk (summary) [13]

[12] Information on the capacity charges payable per contracted lot is published on our website (though not at provider level): https://www.net-connect-germany.com

[13] For the sake of clarity and given the large number of bids with varying commodity charges we received, we decided not to show the individual commodity charges quoted per lot. The individual commodity charges quoted per contracted lot are published on the NCG website: https://www.net-connect-germany.com.

Contract period	Required (MWh/h)	Offered (MWh/h)	Contracted (MWh/h)	Capacity costs[14] (EUR)	Ø Commodity charges (EUR/MWh)
Q4 2016	1,050	4,150	1,050	€778,303	€15.08
Q1 2017	1,050	3,100	1,050	€780,305	€17.06
Q2 2017	1,050	4,200	1,050	€704,715	€13.80
Q3 2017	1,050	3,550	1,050	€543,381	€15.03

Table 19: SystemSell Vreden/Winterswijk (summary) [15]

Contract period	Required (MWh/h)	Offered (MWh/h)	Contracted (MWh/h)	Capacity costs (EUR)	Ø Commodity charges (EUR/MWh)
Q4 2016	3,150	10,800	3,150	€2,900,445	€12.15
Q1 2017	3,150	10,740	3,150	€3,369,404	€17.26
Q2 2017	3,150	13,650	3,150	€3,358,257	€17.11
Q3 2017	3,150	7,600	3,150	€2,930,014	€15.70

Table 20: SystemBuy Elten/Zevenaar (contracts and call orders)

Contract period	Required (MWh/h)	Offered (MWh/h)	Contracted (MWh/h)	Capacity costs (EUR)	Ø Commodity charges (EUR/MWh)
Q4 2016	3,150	10,150	3,150	€2,084,420	€14.77
Q1 2017	3,150	10,470	3,150	€2,208,184	€17.02
Q2 2017	3,150	14,950	3,150	€1,994,171	€14.73
Q3 2017	3,150	13,450	3,150	€1,327,821	€14.39

Table 21: SystemSell Elten/Zevenaar (contracts and call orders)

[14] See footnote No. 6.
[15] See footnote No. 7.

Frequency of use of Long-Term Options (Hour)

Figure 19 shows the aggregate monthly quantities that were supplied and received under LTO contracts for the "Hour" product variant at the two relevant IPs. The quantities are broken down by IP in Table 22 and Table 23.

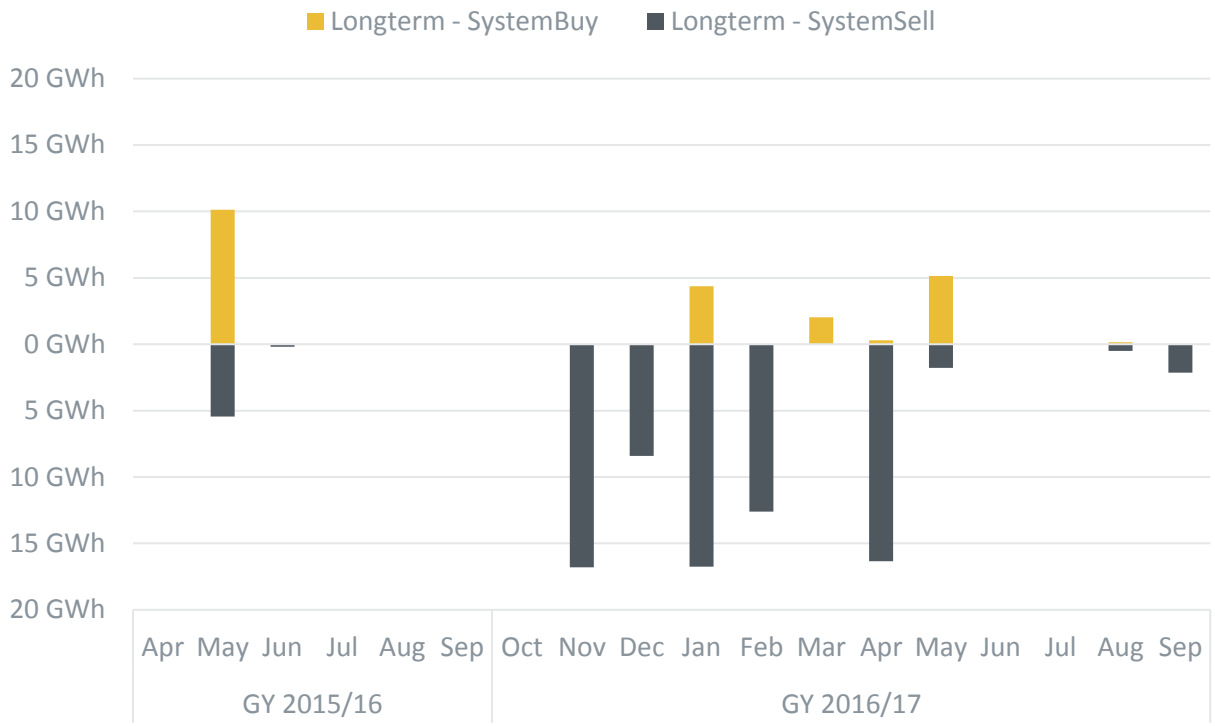

Figure 19: External balancing actions – LTOs (Hour; both IPs by month)[16]

[16] Includes test call orders issued on Hour LTO contracts

Month	SystemBuy Quantity received [MWh]	SystemBuy Amount [EUR]	SystemSell Quantity supplied [MWh]	SystemSell Amount [EUR]
Oct 2016	-	-	-	-
Nov 2016	-	-	12,600	€186,119
Dec 2016	-	-	6,300	€93,059
Jan 2017	2,580	€44,144	12,600	€214,456
Feb 2017	-	-	9,450	€160,842
Mar 2017	2,040	€34,904	-	-
Apr 2017	300	€5,248	12,600	€185,636
May 2017	5,150	€87,153	-	-
Jun 2017	-	-	-	-
Jul 2017	-	-	-	-
Aug 2017	-	-	500	€7,115
Sep 2017	-	-	1,600	€23,812

Table 22: Elten/Zevenaar – quantities supplied/received[17]

Month	SystemBuy Quantity received [MWh]	SystemBuy Amount [EUR]	SystemSell Quantity supplied [MWh]	SystemSell Amount [EUR]
Oct 2016	-	-	-	-
Nov 2016	-	-	4,200	€63,332
Dec 2016	-	-	2,100	€31,666
Jan 2017	1,780	€30,935	4,140	€70,635
Feb 2017	-	-	3,150	€53,729
Mar 2017	-	-	-	-
Apr 2017	-	-	3,730	€51,689
May 2017	-	-	1,780	€24,786
Jun 2017	-	-	-	-
Jul 2017	-	-	-	-
Aug 2017	150	€2,334	-	-
Sep 2017	-	-	540	€8,390

Table 23: Vreden/Winterswijk – quantities supplied/received[18]

[17] See footnote No. 16
[18] See footnote No. 16

Review of options for reducing our use of Long-Term Options (Hour) according to Article 8(6) of the BAL Code

The LTOs contracted by NCG on an "Hour" basis are NCG's only fall-back balancing tool in situations when the exchange is unavailable or the balancing quantities available through the appropriate products traded on the PEGAS exchange are insufficient. The lead times specified for the "NextHour" spot contract traded on ICE Endex for delivery at the TTF are so short as to make it impossible to meet the (re)nomination deadlines applicable at the relevant IPs, which means that the product cannot be used for balancing purposes to meet our flexibility needs at the IPs Elten/Zevenaar and Vreden/Winterswijk.

We could only reduce our "Hour" LTO contract volumes if it was ensured that the existing point-specific MOL 2 balancing products offered on the exchange for the delivery of gas in individual hours were available at all times under any scenario so that we could always procure all balancing quantities needed to meet our balancing requirements by trading these products. In view of the fact that the exchange was unavailable due to maintenance or unplanned downtimes at least once a month in GY 16/17, we do not currently see any options for reducing our LTO contract volumes for the "Hour" product variant.

Table 24 shows the occasions on which the PEGAS exchange was unavailable in GY 16/17 due to maintenance or unplanned downtimes and their duration.

Date of unavailability	From (hour)	To (hour)	Duration (hours:minutes)	Planned/unplanned
11 October 2016	19:40	22:45	03:05	Planned
25 October 2016	19:30	20:45	01:15	Planned
30 October 2016	16:55	18:30	01:35	Unplanned
12 November 2016	19:40	00:15	04:35	Planned
13 December 2016	19:40	22:00	02:20	Planned
30 January 2017	19:40	23:40	04:00	Planned
14 February 2017	19:40	23:15	03:35	Planned
14 March 2017	03:00	08:00	05:00	Planned
26 March 2017	05:44	06:35	00:51	Unplanned
7 April 2017	19:30	23:30	04:00	Planned
9 May 2017	08:10	12:35	04:25	Unplanned
12 May 2017	19:30	23:45	04:15	Planned
8 June 2017	07:00	10:45	03:45	Planned
13 June 2017	19:30	00:15	04:45	Planned
11 July 2017	19:30	22:30	03:00	Planned
4 August 2017	19:05	19:20	00:15	Unplanned
16 August 2017	19:44	20:30	00:46	Planned
1 September 2017	08:17	08:50	00:33	Unplanned
12 September 2017	19:44	23:00	03:16	Planned

Table 24: Overview of (un)planned exchange downtimes in GY 16/17

COST COMPARISON FOR THE BALANCING PRODUCTS "FLEXIBILITY" AND "HOUR"

Since 1 May 2016, the date on which operational balancing accounts (OBAs) were introduced between the adjacent transmission system operators (TSOs) at the IPs Elten/Zevenaar and Vreden/Winterswijk, we have no longer used our balancing product "Flexibility" to meet our within-day flexibility requirements at these IPs but have instead traded point-specific balancing products for hourly delivery on the exchange or bilaterally[19].

Figure 20 shows the average costs incurred under our bilateral contracts for the balancing product "Flexibility" (used from GY 09/10 onwards) in comparison with our cumulative costs for point-specific exchange products and bilateral contracts for hourly delivery at the relevant IPs in GY 16/17.

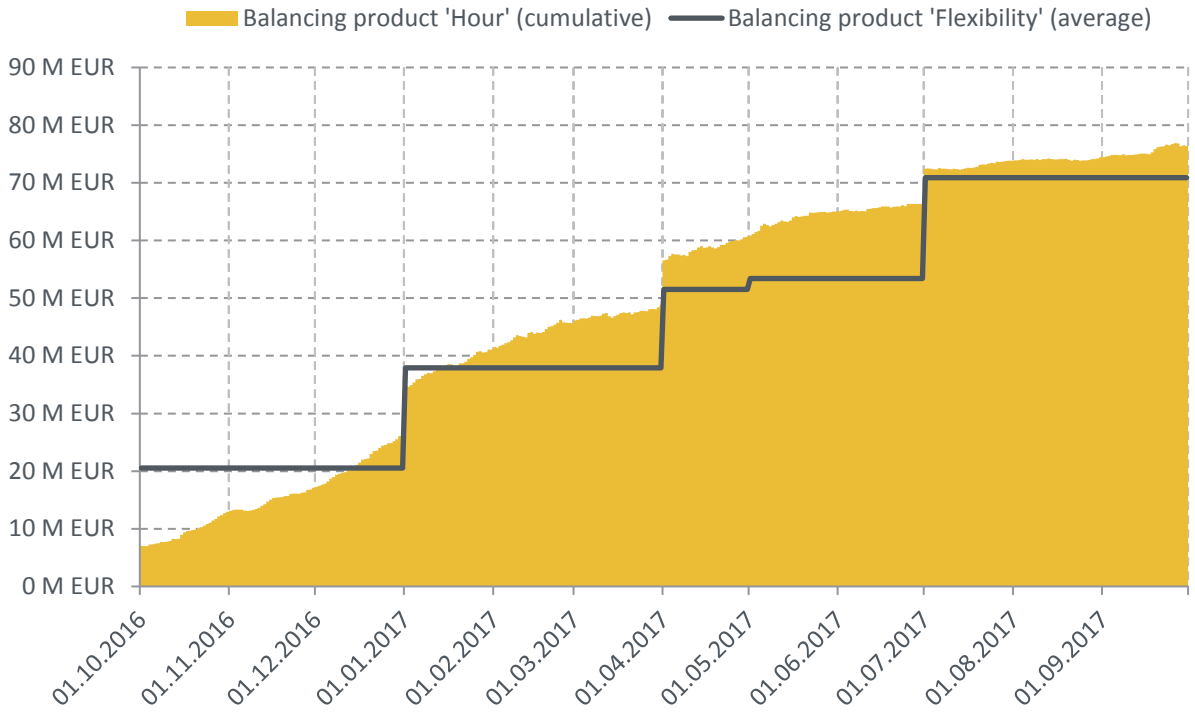

Figure 20: Cost comparison Flexibility vs. Hour

[19] For more information on this, please refer to our System Balancing Report for GY 15/16

5.3. Test call orders

With effect from 1 April 2017, we added contractual provisions on test call orders for all product variants (RoD, DA and Hour) in our product description "Commodity" as well as in our System Balancing Terms & Conditions. In this context we also included new penalty provisions in the event that a provider fails to comply with its obligation to ensure its availability to supply or receive gas under an LTO contract.

NCG has been issuing such test call orders on "RoD" and "Hour" LTO contracts (MOL 4) since April 2017. The purpose of these LTO test call orders is to verify whether balancing providers comply with their contractual communication and availability obligations in order to increase supply security and ensure that the contracted balancing services are rendered in conformity with the agreed contracts.

The LTO providers to whom a test call order is to be issued are selected on a non-discriminatory basis. In particular, NCG has the right to issue a test call order to a provider where considerable time has passed since an LTO call order was last issued to the provider or where there is objective evidence indicating that the provider may not duly comply with its obligations on receiving a call order. No advance notice of a test call order is given to the providers affected; instead, test call orders are treated as a deviation from the prescribed merit order and are published as such on an ex-post basis on the NCG website. In addition, test call orders are only carried out in situations where we have an actual balancing requirement.

In the period from April to October 2017 a total of six LTO test call orders were issued to six providers. Only minor breaches by providers were identified, in which case the contractual penalty provisions were applied.

5.4. Balancing product "Demand-Side Management"

Background and context

The long-term balancing product "Demand-Side Management" (DSM) was launched to implement the BMWi policy paper on natural gas supply security of 16 December 2015 and the Federal Network Agency's first notification on implementation of the GaBi Gas 2.0 ruling published on 25 January 2016, under which the MAMs were required to deliver two measures to strengthen the balancing market.

The product specifications of the DSM balancing product were developed in the autumn of 2016. DSM bids were first requested in the market area NetConnect Germany for the contract period starting on 1 December 2016.

Product description

Essentially, the DSM balancing product was introduced to allow industrial end users to offer and make use of their demand-side flexibility in order to further increase supply security (see chapter 6).

Accordingly, providers offering the DSM balancing product promise their availability to supply gas to the MAM on receiving a call order by procuring a reduction in the rate at which

gas is offtaken at one or more RLM exit points (with both RLMmT and RLMoT exit points being eligible) whilst ensuring that the corresponding gas deliveries to the market area NetConnect Germany are continued.

The DSM contract period, i.e. the period of time throughout which a provider is required to procure availability of the agreed DSM service so as to ensure that the DSM service can be delivered at any time on receipt of a call order, is usually a week, a month, a quarter or a half-year.

In contrast to the LTO balancing product and all of its product variants (RoD, DA, Hour), DSM providers may specify flexible call lead times between 1 and 23 hours. Another difference between the DSM and LTO products is that DSM providers may freely choose the lot sizes offered. Any lot size of 10 MWh/h or greater (in increments of whole numbers) is possible. And in the event of a call order, only the full lot size offered can be requested for delivery, with the provider receiving a daily DSM price in EUR in return. No additional commodity or capacity charges are paid to providers.

Bids for DSM contracts may be submitted by all BGMs who have successfully completed the prequalification process and are thus eligible to participate in our bilateral balancing market. Both the bid submission and contract award processes are conducted through the bilateral bidding platform operated by NCG.

The individual specifications for the DSM product are provided in Table 25.

DSM parameter	Specifications
Product variant	Rest-of-the-Day (RoD)
Product category	Zone-specific
Bid delivery rate	10 MWh/h or greater (in increments of 1 MWh/h)
Point of delivery	Point(s) located within relevant balancing zone as specified in invitation to tender: HN (high CV North), HM (high CV Central), HS (high CV South), LW (low CV West), LO (low CV East)
Pricing	EUR per call day (gas day)
Required service availability	Every gas day throughout the agreed contract period
Call lead time	1 to 23 hours

Table 25: DSM product parameters

TENDER CONTRACT PERIODS AND TENDER RESULTS

Bids for the DSM balancing product were first invited for the contract periods December 2016, January 2017, February 2017 and March 2017, with the corresponding combined tender invitation asking for either or both DSM and LTO bids (RoD) with the aim of increasing gas supply security. However, no DSM bids were submitted at the time. The tender details are provided in Table 26.

Contract period	Total required (MWh/h)	Of which subject to call lead time <= 3 hours (MWh/h)	Offered (MWh/h)	Contracted (MWh/h)
December 2016	9,964	3,813	No bids received	-
January 2017	9,958	4,025	No bids received	-
February 2017	9,958	4,025	No bids received	-
March 2017	9,958	4,025	No bids received	-

Table 26: Long-term balancing requirements and DSM bids

5.5. Future changes to the MOL 4 balancing product portfolio

The MAMs and the BMWi analysed the first DSM tendering rounds held in the winter of 2016/2017 in a joint evaluation exercise conducted in the spring of 2017 and concluded that the rules governing the DSM balancing product would need to be adjusted. In order to improve the operational requirements for industrial end users to participate in the balancing market and increase their willingness to do so, the overall number of days on which the MAM would have the right to request service delivery during a contract period was to be limited and providers were to be given the option to pool several sources of flexibility. In addition, industrial end users who were able to meet the standardised product requirements were to be given the right to apply a capacity charge in return for their commitment to ensure service availability.

In consultation with the BMWi it has thus been decided to merge the LTO and DSM balancing products into a single product with effect from 1 January 2018. Under the revised LTO balancing product designed on this basis providers may offer balancing services for delivery within a specified balancing zone under which they can supply/receive gas at all nomination and non-nomination points within that balancing zone. In order to provide greater flexibility to industrial providers, the new LTO product will also limit the number of permitted call days available to the MAM for SystemBuy balancing actions during each contract period. As part of the product re-design discussions the general framework for long-term balancing services tendered out for delivery in the low CV sectors has also been addressed. The main change in this area is that from 1 January 2018 LTO contracts for the supply/receipt of low CV gas are subject to the restriction that providers are not allowed to use the IPs on the German-Dutch border for service delivery.

In addition, NCG will introduce a new non-standardised balancing product called "Short-Term Balancing Services" (STB)[20] on 1 January 2018 in order to be able to access any additional short-term balancing potential unavailable to the MAM under either the standardised products or the LTO product, with the new STB product to rank at MOL 4. The new STB product is a short-term balancing product that allows providers to offer any current demand-side flexibility at industrial sites they would not otherwise be able to offer on a longer-term basis given the standardised product parameters defined for the LTO product (most notably the required 3-hour call lead time to be complied with in the case of a call order). As is the case with the LTO balancing product, providers submitting bids for the STB product may also use additional sources of flexibility, e.g. storage connection points or cross-border IPs[21], to provide the agreed balancing services. They may also pool several sources of flexibility to meet the product requirements.

STB bids can only be submitted in short-term tendering rounds opened by the MAM at short notice. Providers will be notified of such short-term STB tenders by NCG.

[20] A detailed product description will be provided in the System Balancing Report for GY 17/18
[21] This does not apply in the case of LTOs for the supply/receipt of low CV gas, under which providers cannot use the IPs on the German-Dutch border to provide the agreed balancing services (see paragraph 2 in chapter 5.5)

6. SUPPLY SECURITY MEASURES IN ACCORDANCE WITH THE BMWI POLICY PAPER

BACKGROUND AND CONTEXT

On 16 December 2015 the BMWi published a policy paper on measures to improve natural gas supply security in which it called on the MAMs to implement two measures aimed at strengthening the balancing market. One of these measures was to increase the contract volumes for the existing long-term balancing product LTO, the other measure was to launch a demand response balancing product, also to be contracted on a long-term basis (see chapter 5.4 et seq.).

The first increase of LTO contract volumes was effected by the MAMs in February 2016.

TENDERING OF LTO AND DSM CONTRACTS FOR THE WINTER PERIOD 2016/2017

Following introduction of the DSM balancing product, we ran a combined LTO/DSM tender for the 2016/2017 winter period (1 December 2016 to 31 March 2017) in consultation with the BMWi. For this purpose the ministry defined the level of gas reserves to be held available for supply security purposes, which were to be procured on a best-price basis from bids across both product categories. The required reserve was set at 9,800 MWh/h a month for the market area NCG and provided the base level against which we had to offset the LTO and DSM requirements needed to secure the market area against dynamic effects, with the required reserves being allocated to the individual balancing zones by the TSOs operating in the market area.

The resulting balancing requirements by balancing zone in the months from December 2016 to March 2017 were as follows:

Requirement (MWh/h)	December 2016		January 2017		February 2017		March 2017	
	Dynamic effects	Additional requirement BMWi policy paper	Dynamic effects	Additional requirement BMWi policy paper	Dynamic effects	Additional requirement BMWi policy paper	Dynamic effects	Additional requirement BMWi policy paper
HN (high CV/North)	1,420	0	1,410	0	1,410	0	1,410	0
HM (high CV/Central)	0	1,250	0	1,250	0	1,250	0	1,250
HS (high CV/South)	2,400	2,450	2,620	2,230	2,620	2,230	2,620	2,230
LW (low CV/West)	0	1,850	0	1,850	0	1,850	0	1,850
LO (low CV/East)	0	600	0	600	0	600	0	600
Total/ category	3,820	6,150	4,030	5,930	4,030	5,930	4,030	5,930
Total/month		**9,970**		**9,960**		**9,960**		**9,960**

Table 27: LTO and DSM tender for the 2016/2017 winter period

As we required greater reserves to secure the balancing zone HN against dynamic effects than stipulated by the BMWi for this zone in accordance with its policy paper, the total monthly reserve requirement was higher than specified by the BMWi for supply security purposes. We had to distinguish dynamic requirements on the one hand and the additional BMWi supply security reserves on the other hand to account for the fact that due to the particular nature of the dynamic effects as we define them we can only accept bids subject to a call lead time of no greater than three hours if these are to serve as a buffer in such dynamic balancing situations. So in order to meet these requirements we could only accept LTO or DSM bids specifying a maximum call lead time of three hours. With regard to the supply security reserves tendered out pursuant to the BMWi policy paper, no maximum call lead time had to be specified.

Participation in the tendering exercise for the 2016/2017 winter period was such that we were able to fully meet our balancing requirements from the bids submitted. No DSM bids were received, though, so we only awarded LTO contracts. The tender results are shown in chapter 5.1.

Supplemental LTO and DSM tendering in February 2017

Despite storage facilities heading into the 2016/2017 winter period with above-average inventory levels and in spite of the additional balancing reserves contracted by the MAMs under their LTO contracts, the months December 2016 and January 2017 saw rapid storage withdrawals in Germany. In the NCG market area this development especially affected the storage facilities located in the HS balancing zone, which were down to unseasonably low inventory levels by the end of January 2017.

The high withdrawal rates were driven by a combination of strong gas sales in Western Europe in the wake of a prolonged cold spell and expanding prices in the spot markets.

In order to arrest storage depletion and avoid supply constraints in the weeks ahead, which promised cold temperatures, we issued a supplemental LTO tender invitation to shore up our reserves. For the purpose of this tendering exercise we limited the zones permitted for balancing service delivery. Instead of the usual zone-specific LTO bids under which delivery can be made at any point within the relevant balancing zone, we only accepted LTO bids for delivery at storage connection points located in the balancing zone HS. Alternatively, providers could submit DSM bids for delivery at points within the balancing zone HS to account for the fact that any reduction in offtakes would help stabilise the balancing zone.

The supplemental bids needed to cover the corresponding long-term balancing requirements in the multi-quality NCG market area were invited for the contract period from 15 February 2017, 06:00 to 1 March 2017, 06:00, with providers asked to submit “Commodity” bids for the “RoD” product variant of the LTO product category as well as DSM bids. DSM bids were requested for the supply (SystemBuy) of high CV gas by providers in the balancing zone HS, and LTO bids were requested for the supply (SystemBuy) of high CV gas at specified storage connection points. Additional reserves of 4,000 MWh/h were contracted (see chapter 5.1), all under LTO bids for delivery at the storage facilities Inzenham West and Bierwang.

Owing to the fact that the providers who had been awarded contracts in the course of the tender were now contractually bound to keep specified gas reserves available, storage withdrawal rates went down significantly from around mid-February. As a result, sufficient flexibility was secured at the above storage facilities for the remainder of that year's winter period.

7. LOCATIONAL BALANCING PRODUCTS

NCG uses zone-specific balancing products to meet external balancing requirements that relate to a specific balancing zone. Balancing requirements that relate to specific system points are met by trading point-specific balancing products. Trading participants and providers trading zone- or point-specific balancing products have an obligation to cause a physical effect in the relevant balancing zone or at the agreed system point (as the case may be). Point-specific balancing products are traded for delivery on a RoD and DA basis as well as for hourly delivery, in which case delivery must be made in an exactly specified delivery hour (product variant "Hour"). Below we describe our use of zone- and point-specific balancing products in the context of RoD and DA balancing requirements. Our use of "Hour" balancing products for the purpose of structuring gas flows at the IPs Elten/Zevenaar and Vreden/Winterswijk during the gas day is described in chapter 5.2.

Figure 21 shows the zone- and/or point-specific balancing products we used in GY 15/16 and GY 16/17 to take RoD and/or DA balancing actions on a monthly basis, separately for SystemBuy and SystemSell and broken down by balancing zone. In GY 16/17 we only used these products when the merit order so mandated, that is only in situations where the exchange was unavailable due to downtimes of the PEGAS trading platform and only to respond to global or quality-specific balancing requirements, not to meet zone- or point-specific RoD or DA balancing requirements. In GY 16/17 we did not use any zone-specific balancing products ranking at MOL 2.

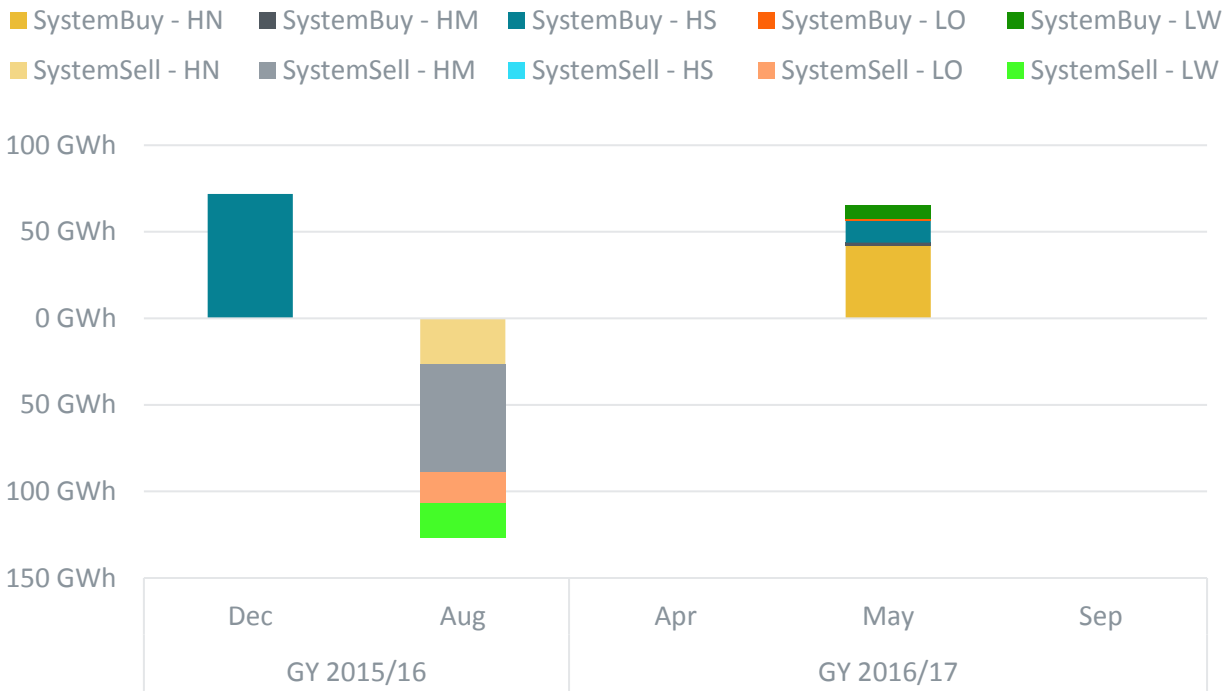

Figure 21: External balancing actions – zone-specific balancing actions (by balancing zone and month)

8. Review of approved interim measures (according to Article 46 of the BAL Code)

In 2014, in section 7 of their "Recommendation Document based on the Regulation establishing a Network Code on Gas Balancing of Transmission Networks", the MAMs applied to the Federal Network Agency under Article 47 of the BAL Code for permission to continue using their existing balancing platforms. At the time NCG believed that it was necessary to apply for approval of an interim measure allowing continued use of the existing balancing platforms because the trading opportunities provided on the exchange had not always been – and continued not to be – sufficient to ensure that we would be able to meet our balancing requirements in any possible scenario. Aside from exchange unavailability, this would include situations when a balancing action is required in a specific network zone or even at a specific system point. In exceptional circumstances it is especially important that we are able to meet our balancing requirements in these cases in order to ensure system stability. Yet the products required in such situations are not available on the exchange, which means that the exchange cannot be used as a procurement tool in these cases. In its GaBi Gas 2.0 decision the Federal Network Agency granted permission to the MAMs under Article 45(4) of the BAL Code to continue using their balancing platforms up to 16 April 2019.

Within MOL 3 NCG currently has the option to enter into so-called "Locational Market Transactions" on a short-term basis (both RoD and DA). Under this product providers supply or receive gas physically at a specified entry or exit point located within a pre-defined network area. Locational Market Transactions are a standardised product that serves as a short-term external balancing tool. The product's design (concerning call lead times, partial delivery etc.) is to a large part identical to the corresponding contracts traded on the exchange. In GY 16/17 MOL 3 balancing actions made up only 0.1% of the total external balancing quantities supplied or received in the NCG market area[22] and were only carried out when the exchange was unavailable due to maintenance or unplanned downtimes.

The MOL 4 bids to be received under the STB product arrangements from 1 January 2018 (provided NCG invites bids for the STB product in the first place) can be categorised as balancing services within the meaning of Article 8 of the BAL Code (see chapter 5.5). Under Article 8(1) of the BAL Code TSOs/MAMs are entitled to procure balancing services for those situations in which short-term standardised products will not or are not likely to provide the response necessary to keep the transmission network within its operational limits or in the absence of liquidity of trade in short-term standardised products. In NCG's view a product with the STB specifications is necessary to ensure that we are able to address certain short-term locational balancing situations via MOL 4. In addition, thanks to the flexible call lead time specifications applying to STBs, which allow for call lead times below the 3-hour standard used on the exchange, a fast response to ad-hoc imbalances is also possible. Owing to the flexible product parameters market participants are also able to offer industrial end users' demand-side flexibility in the balancing market on a short-term basis, which they would

[22] See chapter 7

not otherwise be able to offer on the exchange due to the rigid specifications of the products traded there.

Table 28 below compares the STB product parameters with those of the standardised short-term products traded within MOL 3. The comparison shows clearly that in certain balancing situations the STB product may provide the response necessary to keep the transmission network within its operational limits, as required under Article 8(1) of the BAL Code.

In launching the STB product the MAMs thus intend to implement non-standardised short-term products. "Non-standardised" applies in that the product specifications, which include flexible call lead times, lot sizes etc., vary from the standardised exchange products and other existing balancing products. The MAMs believe that introducing the STB product is a more suitable approach than trading the standardised short-term products currently ranking at MOL 3, as the corresponding balancing situations could be handled fully and more flexibly using the STB product. A look at other European countries also shows that it can be more appropriate to use balancing services and/or supply security tools to respond to exceptional balancing situations instead of creating additional wholesale products designed to meet this particular demand.

In summary, it can be said that launching the STB product and discontinuing the MOL 3 products from 1 January 2018 is in conformity with the BAL Code. The provisions of the GaBi Gas 2.0 decision do not conflict with the introduction of the STB product within MOL 4, either. Under the decision's stipulations continued use of the merit order rank MOL 3 is not a mandatory requirement, which is why from 1 January 2018 we will take our balancing actions in the order MOL 1 --> MOL 2 --> MOL 4. Within MOL 4 we may include all non-standardised balancing products, irrespective of whether they are contracted on a short-term or long-term basis. The STB product satisfies these requirements.

In view of the discontinuation of the short-term bilateral balancing products traded at MOL 3 the permission for continued operation of the existing balancing platforms currently in place may expire as planned, on 16 April 2019. NCG will continue to use the non-standardised MOL 4 balancing products (LTO and STB) beyond 1 January 2018 and publish the corresponding tender invitations and award related contracts via a bidding platform.

Parameter	MOL 3 (RoD and DA products)	MOL 4 (STBs)
Ranking at	MOL 3 (point-specific)	MOL 4 (balancing service)
Procurement via	Continuous trading (24/7)	Traded only in event of short-term locational constraints or if MOL 1 and MOL 2 are technically unavailable
Tendering process	No express tender invitations	Tender invitations as and when needed
Lot size	10 MW	May vary, at least 10 MW
Call order quantity	Partial quantities possible (in increments of 10 MW)	Only full lot size
Call lead time	3 hours	May vary, 1 to 23 hours
Point of delivery	Specified system point	Specified balancing zone or sector

Table 28: Comparison of product parameters – STB vs. short-term MOL 3 products

9. ALLOCATION OF COSTS TO THE BALANCING NEUTRALITY ACCOUNTS

Below we describe the methodology we use to allocate our balancing costs between the balancing neutrality accounts currently in place; we also provide a review of whether the way in which we determine the applicable annual allocation keys continues to be appropriate, which is an annual requirement under the GaBi Gas 2.0 ruling.

All system balancing costs that can be divided between the balancing neutrality accounts in accordance with the cost causation principle based on the corresponding imbalances determined for network operators' network balancing accounts or BGMs' balancing groups are allocated using the applicable daily allocation key. Annual allocation keys are applied if the relevant cost items (e.g. capacity charges payable under LTO contracts) cannot clearly be allocated according to causation. As a rule, the applicable annual allocation key is calculated as the mean of all daily allocation keys applicable during the relevant gas year. This mean may be calculated using either an arithmetic or a volume-weighted approach.

NCG has chosen to apply the arithmetic approach for the following reasons: We consider the determination of an arithmetic mean to be an appropriate approach as the balancing quantities procured for each day cannot directly be related to the cost and revenue items that are allocated to the individual balancing neutrality accounts based on the annual allocation key. Compared with the arithmetic approach, the application of a volume-weighted mean would increase complexity without providing a better measure of causation.

We are therefore of the view that the annual allocation keys should continue to be calculated as an arithmetic mean in the future.

10. OTHER BALANCING ACTIVITIES: SUPPLY OF EXTRATERRITORIAL NETWORKS

The German network areas downstream from the IPs Haanrade and Dinxperlo on the German-Dutch border have no physical connection to the German gas network ("extraterritorial networks") and can therefore only receive gas from the Dutch gas system. At the German-Dutch IP Tegelen an actual physical connection to the German gas supply network exists but only insufficient gas supplies can be physically delivered to the connected distribution system in the months from 1 November up to and including 31 March each year. So during these months only a gas supply from the Dutch gas system operated by GTS can ensure the pipeline inventory levels required to maintain minimum pressure, with the distribution system concerned being exclusively supplied via the entry point Tegelen during this time.

In order to comply with market liberalisation requirements, which include a requirement to facilitate supplier switching at end user level, NCG conducted a transparent tender process in consultation with the network operators involved to invite bids for the supply of gas to these extraterritorial networks, with bids for the supply of gas at the IP Tegelen requested for the period from 1 November 2016 to 31 March 2017 and bids for the supply of gas at the IPs Haanrade and Dinxperlo being requested for the period from 1 January 2017 to 31 December 2017.

Suppliers were asked to submit bids for the provision of the required gas quantities directly on the Dutch exit side of the IPs Haanrade, Dinxperlo and Tegelen. The supply of gas to the end users located downstream from these IPs (industrial sites and private households) was not part of the scope of the tender.

In choosing this approach NCG ensures that the networks downstream from the IPs Haanrade, Dinxperlo and Tegelen can be integrated into the market area NetConnect Germany, and thus enables suppliers to supply the end users affected from inside the market area NetConnect Germany. This makes it possible for the end users connected to these extraterritorial networks to freely choose their suppliers in accordance with the rules for supplier switching processes.

The activities we undertake to implement these market liberalisation requirements can be characterised as "other balancing activities" falling within the scope of the GaBi Gas 2.0 ruling. The costs incurred for the gas quantities supplied under the full-supply contracts signed in the course of this tender process are therefore recovered through the balancing neutrality charges. The costs for the required transportation capacity are borne by the network operators involved.

A proceeding brought by a market participant alleging abusive practices and seeking clarification as to the scope of the MAMs' obligation under section 22(1) of the German Energy Industry Act (*EnWG*) to procure balancing gas and balancing services in a transparent, non-discriminatory and market-based way as well as concerning network operators' obligation under section 20(1) of the Energy Industry Act to grant access at the entry and exit points of their networks to third parties on a non-discriminatory basis was dismissed by the Federal

Network Agency's Ruling Chamber No. 7 in a decision handed down on 29 June 2017 (ref: BK7-17-003).

In May 2016 NCG invited indicative bids for a total gas quantity of 534,000 MWh to be supplied in the above periods and sub-networks in a transparent and non-discriminatory process. Seven wholesale suppliers responded to this invitation and submitted indicative bids. Following an evaluation of the price information and contract documents received, three wholesale suppliers were asked to submit binding bids to NCG by mid-September 2016.

Based on a comparison of the fixed prices offered at the relevant reference date, we accepted the best-priced bid submitted, which quoted a fixed price of 15.525 EUR/MWh.

Outlook

Article 19(9) of Regulation (EU) 2017/459 (Network Code on Capacity Allocation Mechanisms) requires TSOs to combine IPs between adjacent entry/exit systems into so-called "virtual interconnection points" (VIP) by 1 November 2018. If the IPs subject to the above tendering process are assigned to such a VIP, it may no longer be possible to use the arrangements described above to supply the extraterritorial networks concerned.

11. DEVELOPMENT OF THE FEES AND NEUTRALITY CHARGES LEVIED IN THE NCG MARKET AREA

Below (Table 29) you can find an overview of the fees and neutrality charges applied in our market area in accordance with the GaBi Gas 2.0 and Konni Gas rulings in the period up to and including 30 September 2017 and from 1 October 2017.

According to the information currently available – and provided that the final status matches NCG's current estimate – NCG may have generated a surplus for the neutrality accounting period from October 2016 up to and including September 2017 under the GaBi Gas 2.0 balancing neutrality arrangements, which, if confirmed, will be distributed to BGMs in accordance with the applicable contractual arrangements.

Based on current data, distributions may be made from both balancing neutrality accounts, with the corresponding payments to be effected in early 2018 once all final data for the current period is available.

NCG does not expect to generate a surplus in its conversion neutrality account for the neutrality accounting period from April 2017 up to and including September 2017 under the Konni gas conversion neutrality arrangements.

Fees/neutrality charges	Until 30 September 2017	From 1 October 2017
Conversion fee (H-to-L)	0.45 EUR/MWh	0.45 EUR/MWh
Conversion fee (L-to-H)	Fee no longer applied according to Konni Gas	Fee no longer applied according to Konni Gas
Conversion neutrality charge	0.04 EUR/MWh	0 EUR/MWh
RLM balancing neutrality charge	0 EUR/MWh	0 EUR/MWh
SLP balancing neutrality charge	0.8 EUR/MWh	0 EUR/MWh

Table 29: Current fees and neutrality charges applicable in the NCG market area

12. CONCLUSIONS/SUMMARY

A key finding from this year's System Balancing Report for GY 16/17 is that our balancing requirements have nearly halved in absolute terms when compared with GY 15/16. This is mainly due to notable changes in market participants' virtual conversion activities. Despite a slightly rising share of our MOL 1 balancing actions, the largest part of our RoD and DA balancing actions was again carried out using quality-specific products. But as in the previous year, we did not have to resort to the zone-specific products available within MOL 2 in this context.

In order to comply with regulatory requirements we discontinued our balancing product "Flexibility" – which had been based on capacity charges only and had been used to structure gas flows in the low CV gas sector – effective May 2016, which led to a significant rise in the number of our trades compared with the previous gas year given that our procurement activities now covered a full gas year for the first time. We now meet our point-specific hourly balancing requirements at the IPs Elten/Zevenaar and Vreden/Winterswijk by trading the corresponding commodity-based balancing products on the exchange or bilaterally, i.e. via point-specific balancing transactions within MOL 2 (exchange) or MOL 3 and MOL 4 (bilaterally). The cumulative costs we incurred in this area in GY 16/17 were at a similar level to the costs we had incurred previously under the old balancing product Flexibility.

Liquidity in the relevant order books on PEGAS continued to be good, which allowed us to effect nearly all our balancing transactions at market price levels using spot contracts traded via the exchange. Thanks to this high level of liquidity in our own market area, we did not trade any gas in adjacent market areas. Even so, as the current calculation methodology used to calculate the corresponding transportation markups and markdowns was still based on past capacity utilisation, we had to implement a few changes to how we calculate these.

Following the entry into force of the within-day obligation rules at the start of GY 16/17, we observed a tendency for market participants to make use of the additional flexibility available under the new incentive mechanism and also noted an uptake of balancing situations in which we had to act on both sides of the market. The fact that BGMs' within-day flexibility quantities went down in the summer months after we applied our first within-day flexibility charges reflecting the costs of these balancing actions could be an indication of the effectiveness of the new incentive mechanism. As the within-day obligation rules have only been in force for a short time, their effect on BGMs' within-day flexibility quantities and on the scale of our within-day balancing actions in opposite directions still needs to be monitored in future.

GY 16/17 was also the year in which we implemented the supply security measures set out in the BMWi policy paper. As called on by the BMWi, we increased our LTO contract volumes in consultation with the authorities and launched a new MOL 4 balancing product called "DSM". Based on the insight gained from the first combined LTO-DSM tendering exercise conducted in winter 2016/17, some changes were made to the balancing products available at MOL 4 in the spring of 2017. As part of the changes the existing LTO and DSM products have been merged into a single new LTO product to be used from 1 January 2018

and a new non-standardised short-term balancing product (STB) will be launched in MOL 4 on the same date.

The introduction of the STB product also means that the short-term balancing product currently traded at MOL 3 will no longer be needed from January 2018 going forward. In view of the discontinuation of these products the permission for continued operation of the existing balancing platforms currently in place may expire as planned, on 16 April 2019. NCG will continue to use the non-standardised MOL 4 balancing products (LTO and STB) beyond 1 January 2018 and publish the corresponding tender invitations and award related contracts via a bidding platform.

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