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Evaluation Report on the Gas Quality Conversion Mechanism

Current as at January 2017

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Definitions

Virtual conversion quantity

The quantity converted and invoiced for each balancing group portfolio under the cross-quality energy balancing mechanism, i.e. if the high CV and low CV gas balances determined for a master balancing group have opposing signs, the lower of the two quantities (as measured in terms of their absolute values) is billed as the conversion quantity. Where low CV gas deficits are balanced out by means of high CV gas inputs, this is referred to as virtual conversion taking place in the direction from high CV to low CV quality (H to L). The reverse direction is defined as virtual conversion from low CV to high CV quality (L to H). The term "virtual conversion" may also refer to the sum of the virtual conversion quantities determined for the individual balancing groups.

System-wide virtual conversion quantity

One of the alternative approaches for determining the actual overall conversion quantity: The sum of all inputs and offtakes across all balancing group portfolios with allocations for gas of both gas qualities is determined (separately) for each gas quality. If the resulting high CV and low CV balances are in opposite directions (different algebraic signs), then the smaller of the two quantities (as measured in terms of their absolute values) represents the system-wide virtual conversion quantity.

From the quantity thus obtained the technical conversion quantities that have been converted exclusively for virtual conversion purposes must be deducted. In this calculation all balancing group portfolios comprising at least one subordinate balancing group for gas of a quality different from the gas quality of the master balancing group are taken into account. Both the master balancing group and the subordinate balancing group must be actively used, i.e. both must have been declared as receiving data for balancing purposes.

Commercial conversion

In order to apply a commercial value to the system-wide virtual conversion quantity the relevant figure is compared with the quantities delivered/received as part of external balancing actions on the day in question. For this purpose it is assumed that quality-specific balancing sell transactions in the gas quality for which there is an oversupply and the quality-specific or locational balancing buy transactions in the quality for which there is an undersupply have been made for the purpose of commercial conversion, with the upper limit being represented by the system-wide virtual conversion quantity.

Physical conversion quantity

One of the alternative approaches for determining the actual overall conversion quantity: Where balancing actions have been taken in opposite directions, i.e. where quality-specific (balancing criterion "Quality") or locational balancing buy transactions have been made in one gas quality whilst quality-specific or locational balancing sell transactions have been made in the other gas quality, the smaller of the two quantities (as measured in terms of their absolute values) represents the actual overall conversion quantity.

Actual overall conversion quantity

Umbrella term for the quantity determined according to either the “system-wide virtual” approach or the “physical” approach.

Technical conversion

This refers to the gas quantities technically converted by means of mixing plants owned by the transmission system operators OGE and TG. OGE operates mixing plants converting between both gas qualities (from high CV to low CV quality and vice versa), whereas the Thyssengas mixing plants convert high CV gas to low CV gas only.

1. INTRODUCTION

NCG has been operating a multi-quality market area since 1 April 2011. The rules for the gas quality conversion mechanism were set out in an administrative ruling handed down by the German national regulatory authority Bundesnetzagentur (below referred to as the "Federal Network Agency") on 28 March 2012 (ref: BK7-11-002, the so-called "Konni Gas" decision), which was amended by the Federal Network Agency's decision of 21 December 2016 (ref: BK7-16-050, below referred to as the "amended Konni Gas ruling").

NCG has an obligation under both the original as well as the amended Konni Gas rulings to submit an annual evaluation report on the development and evaluation of the conversion mechanism by 1 February every year. The present evaluation report describes the conversion developments observed since the multi-quality market area was launched and sets out the reasons why we believe it is necessary to continue to charge a conversion fee for the conversion of gas from high CV to low CV quality (H to L).

The amended Konni Gas ruling allows for the H-to-L conversion fee to be retained permanently beyond 1 April 2017. No conversion fee may be applied for the conversion of gas from low CV to high CV quality (L to H). Since 1 October 2016, NCG has only been charging an H-to-L conversion fee.

This report is structured as described below:

In chapter 2 we examine the development of the virtual and technical as well as the actual overall conversion quantities in our market area. Chapter 3 describes the commercial aspects of the conversion mechanism and provides information on the development of the relevant costs and revenues including the current position of our conversion neutrality account. In chapter 4 we provide an analysis of the reasons why we believe that it is necessary to retain the conversion fee.

2. REVIEW AND EVALUATION OF PHYSICAL AND TECHNICAL DEVELOPMENTS

2.1. DEVELOPMENT OF THE VIRTUAL CONVERSION QUANTITIES

DEVELOPMENTS IN PREVIOUS CONVERSION PERIODS

In the first three conversion periods balancing group managers (BGMs) hardly used the virtual conversion mechanism (see Table 1 below). Only when the conversion fee was reduced to 0.70 EUR/MWh for the fourth conversion period did the virtual conversion quantities rise slightly. It was as the result of another reduction of the conversion fee down to 0.60 EUR/MWh in the fifth conversion period that we temporarily saw a significantly more active use of the virtual conversion mechanism in the L-to-H direction, particularly in the period between April and the middle of June 2013, which decreased again notably in the following periods. Active use of the virtual conversion mechanism in the H-to-L direction was not observed until the end of the eighth conversion period (1 October 2014 to 31 March 2015), with the conversion fee standing at 0.40 EUR/MWh. This trend accelerated after the conversion fee was reduced to 0.30 EUR/MWh for the subsequent (ninth) period. In the tenth period – with the conversion fee remaining unchanged – the virtual conversion quantities went up significantly, most notably in the months from February 2016. Conversion activities continued at a high level right into the eleventh period, especially in April and May 2016, despite an increase of the conversion fee to 0.453 EUR/MWh in this period.

Looking back at the last four complete periods we can now say that market participants have been making active use of the options available under the balancing regime to supply their low CV exit points by means of high CV gas inputs (which is what we refer to as “H-to-L conversion”).

Table 1 shows the net virtual conversion quantities in each conversion period, with data shown in italics representing projected data.

No.	Conversion period	Conversion fee (H→L)	Conversion fee (L→H)	Net virtual conversion quantity	Direction of conversion (net)
1	01/04/2011 - 30/09/2011	2.000 EUR/MWh	2.000 EUR/MWh	335,599 MWh	L→H
2	01/10/2011 - 31/03/2012	1.500 EUR/MWh	1.500 EUR/MWh	95,311 MWh	L→H
3	01/04/2012 - 30/09/2012	0.900 EUR/MWh	0.900 EUR/MWh	355,605 MWh	L→H
4	01/10/2012 - 31/03/2013	0.700 EUR/MWh	0.700 EUR/MWh	3,086,242 MWh	L→H
5	01/04/2013 - 30/09/2013	0.600 EUR/MWh	0.600 EUR/MWh	6,294,290 MWh	L→H
6	01/10/2013 - 31/03/2014	0.600 EUR/MWh	0.600 EUR/MWh	917,464 MWh	L→H
7	01/04/2014 - 30/09/2014	0.400 EUR/MWh	0.400 EUR/MWh	296,282 MWh	H→L
8	01/10/2014 - 31/03/2015	0.400 EUR/MWh	0.400 EUR/MWh	2,101,977 MWh	H→L
9	01/04/2015 - 30/09/2015	0.300 EUR/MWh	0.300 EUR/MWh	7,287,886 MWh	H→L
10	01/10/2015 - 31/03/2016	0.300 EUR/MWh	0.300 EUR/MWh	19,416,262 MWh	H→L
11	01/04/2016 - 30/09/2016	0.453 EUR/MWh	0.453 EUR/MWh	7,721,889 MWh	H→L
12	01/10/2016 - 31/03/2017	0.000 EUR/MWh	0.453 EUR/MWh	*2,666,919 MWh*	*H→L*

Table 1: Net virtual conversion quantities

Developments in the current conversion period and outlook

The L-to-H conversion fee was fully phased out at the start of the current conversion period (October 2016 to April 2017), when the fee was reduced from 0.453 EUR/MWh in the previous period down to zero for the current period. With regard to the H-to-L conversion direction, we submitted a formal notice to the Federal Network Agency to inform the regulator that we intended to continue to charge a conversion fee of 0.453 EUR/MWh for conversion activities in this direction instead of implementing the last fee reduction as originally envisaged.

Given that no or only preliminary data was available for a part of the current conversion period, we determined the relevant quantities based on a projection of the developments expected until the end of the relevant period (see Figure 1). Compared with the previous period, we expect the overall virtual conversion quantities to go down. Considering current developments, we expect a net conversion quantity of 2.7m MWh to be converted from high CV to low CV quality (H to L) by the end of this period. This number is based on the assumption that a quantity of 5.3m MWh will be converted from high CV to low CV quality (H to L), with a quantity of 2.6m MWh being converted in the opposite direction.

We expect an H-to-L market shift of around 4.5 % to take place in this period. By "market shift" we mean the proportion (in per cent) in which exit points using gas of one gas quality are supplied with gas of the other gas quality via the virtual conversion mechanism.

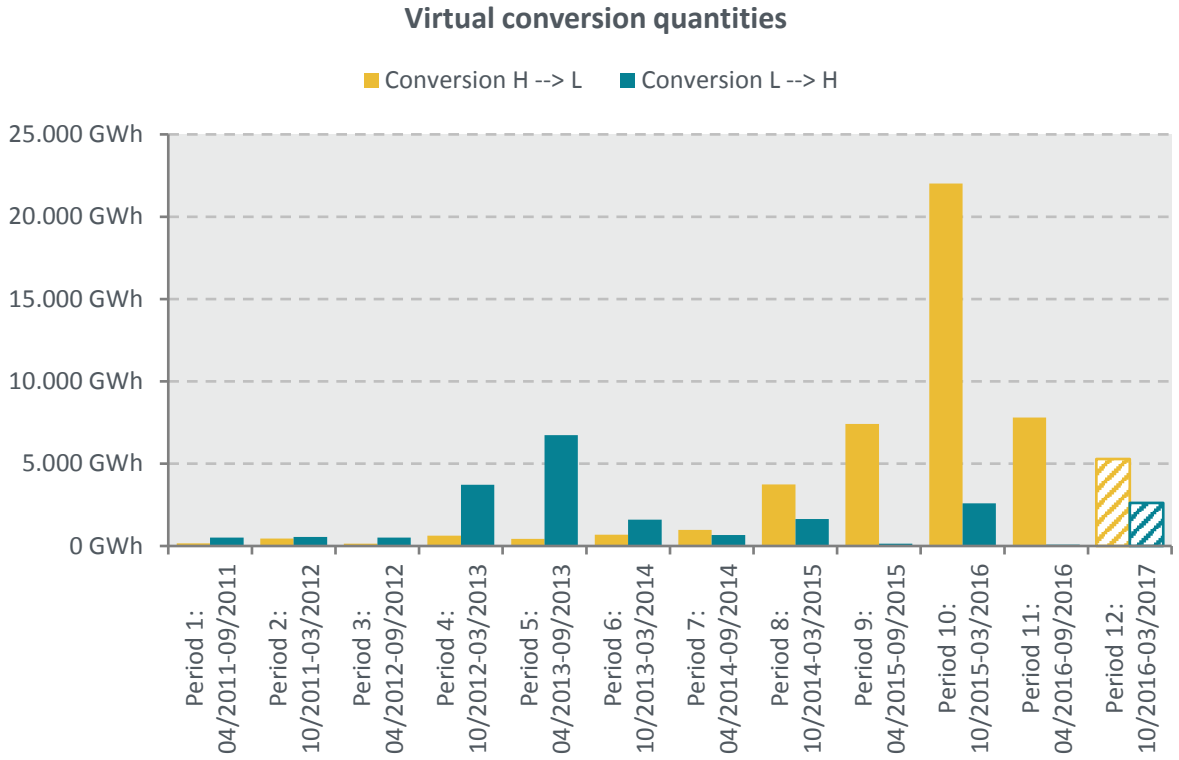

Figure 1: Virtual conversion quantities

The market shift figures for the previous periods and the (projected) market shifts in the current conversion period from October 2016 to April 2017 are shown in Figure 2 for each conversion direction, with hatched areas representing projected data.

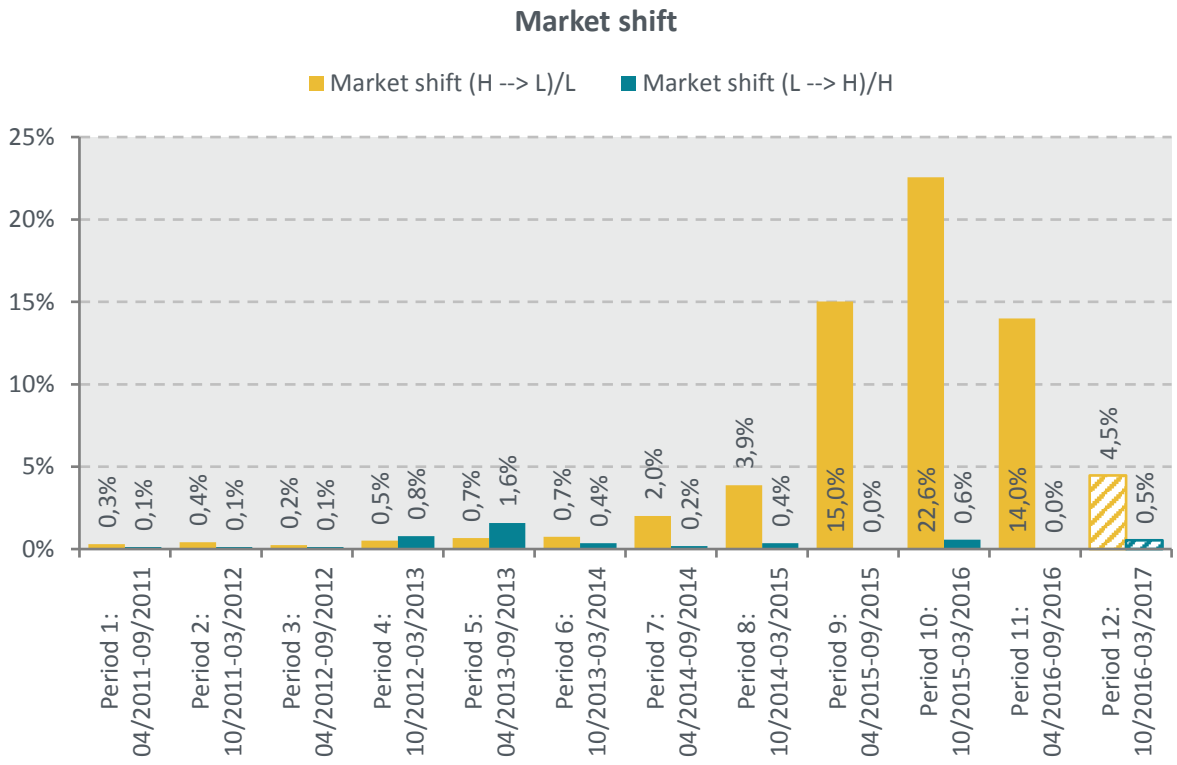

Figure 2: Market shift percentages

2.2. Review of the actual overall conversion quantities

According to the Federal Network Agency's Konni Gas ruling, the market shift that needs to be counterbalanced through technical and/or commercial measures may be determined following a system-wide virtual approach or a physical approach.

Due to the availability of technical conversion facilities in its market area NCG has decided to follow the system-wide virtual approach in determining the overall conversion quantities. Under this approach the actual overall conversion quantities are determined by aggregating all inputs and offtakes delivered to and from all actively used linked balancing groups separately for each gas quality. Figure 3 shows the actual overall conversion quantities in each conversion period, with hatched areas representing projected data. Due to netting effects the actual overall conversion quantities are lower than the virtual conversion quantities previously considered. Netting effects result from the mutual offsetting of inputs and offtakes when calculating the sums for the entire market area in each gas quality.

Actual conversion is only deemed to have taken place where opposite balances have been determined for the different gas qualities (e.g. an oversupply to the high CV system and an undersupply in the low CV system). Based on the data currently available and considering the developments seen to date, we expect to see a net actual overall conversion quantity of 2.2m MWh (H to L) by the end of the current conversion period.

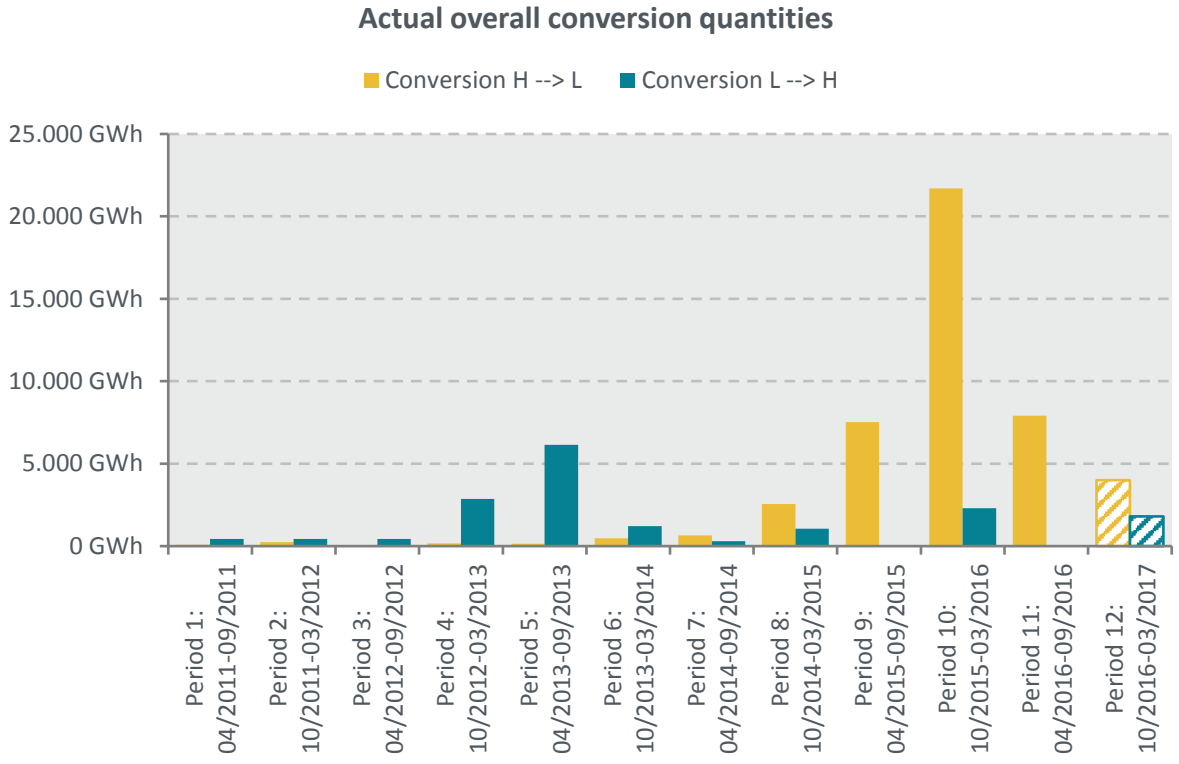

Figure 3: Actual overall conversion quantities

2.3. TECHNICAL CONVERSION QUANTITIES

At present, OGE and TG own technical conversion facilities in the NCG market area. OGE's Werne gas mixing plant is capable of adding both low CV gas to the high CV system and high CV gas to the low CV system. OGE's Scheidt mixing plant adds low CV gas to the high CV system. TG, in contrast, has a gas-air mixing plant located in Broichweiden. The facility adds air to high CV gas in order to obtain low CV gas. No third-party conversion facilities are currently used. So far, the use of the OGE and TG mixing plants has not generated any additional costs that would need to be recovered through the conversion fee. The utilisation of the technical mixing plants is shown in Figure 4.

Since March 2015, there has been a considerable decline in the technical conversion capability for the conversion of gas from high CV to low CV quality, most notably at the Werne gas mixing plant. It is assumed that this development can be attributed to the increased technical conversion activities in the Dutch gas transmission system, where high CV gas is converted to low CV gas through the addition of nitrogen. As nitrogen is added, the Wobbe Index of the low CV gas received from the Netherlands rises, which results in a higher calorific value. This in turn limits the high CV to low CV conversion capability of the Werne mixing plant. In view of the expected decline in Dutch low CV gas production volumes from the Groningen gas field, we assume that the conversion capability of the Werne mixing plant will continue to be subject to limitations.

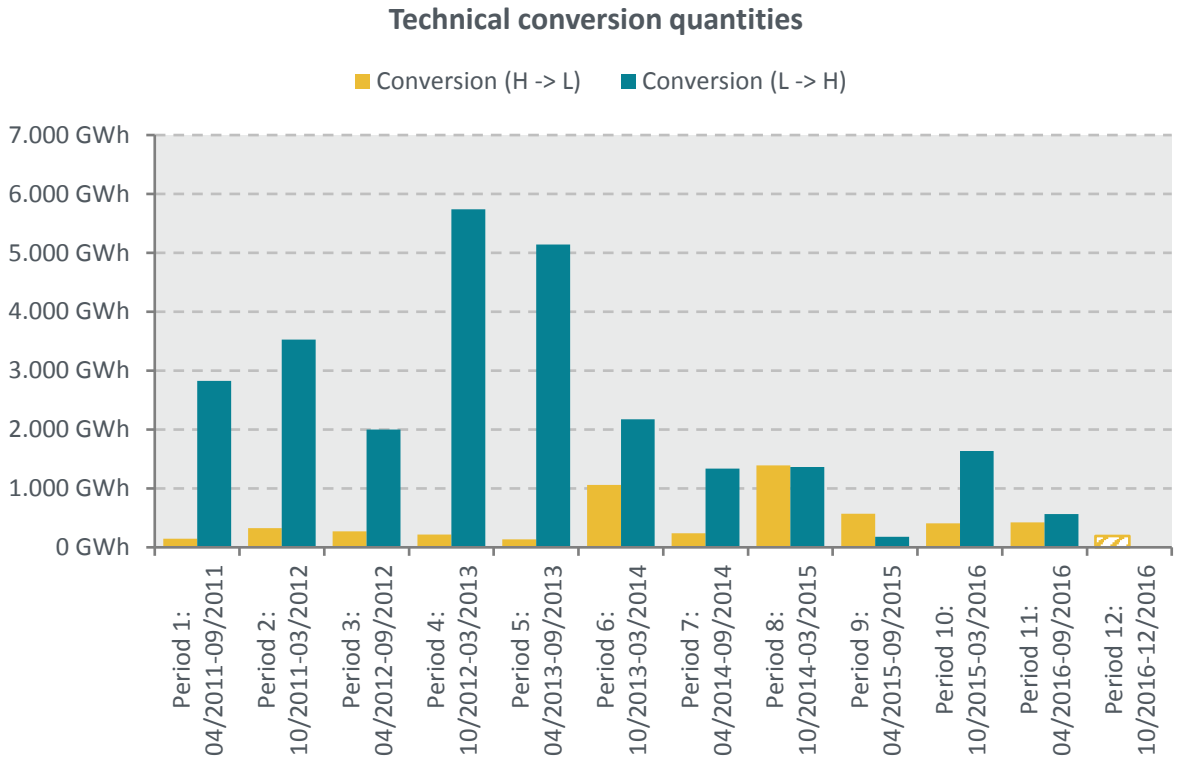

Figure 4: Technical conversion quantities

2.4. USE OF COMMERCIAL CONVERSION MEASURES

APPROACH FOR CALCULATING THE COMMERCIAL CONVERSION QUANTITIES

Commercial conversion measures need to be taken in situations where using the technical conversion facilities is not sufficient to counterbalance market shifts.

The first step in determining the quantity converted through commercial conversion measures is to calculate the sums of the balancing quantities sold in the gas quality for which there is an oversupply and the balancing quantities purchased in the gas quality for which there is an undersupply, respectively. In view of the fact that for "Global" balancing actions the gas quality is no relevant criterion, only purchases/sales made to meet "Quality" or "Local" balancing requirements (merit order ranks MOL 2 and MOL 3) are taken into account when calculating the overall commercial conversion quantity. Where the above calculations show that balancing actions have been taken in opposite directions in the two different gas qualities (e.g. sales of high CV gas and purchases of low CV gas), the relevant figure is compared with the direction of the system-wide virtual conversion quantity previously determined. If the direction of the relevant opposite balancing actions corresponds to the direction in which the system-wide virtual conversion quantity has been converted, then the smaller of the two values (as measured in terms of their absolute values) represents the quantity that was converted by way of commercial conversion measures in each direction.

Where even within one gas quality balancing actions have been taken in opposite directions, the actual overall sell/buy figure is used, i.e. where there is an oversupply in the market area and gas has been both sold and purchased on that day, only the gas quantities sold in the relevant gas quality are taken into account, and not offset by the quantities bought in that quality. Any netting between quantities of the same quality would result in reduced sell or buy quantities, which would not reflect the actual balancing actions taken. The corresponding quantity for the other gas quality is determined following the same principles. The balancing quantity deployed in opposite directions is determined as the smaller of the two quantities (as measured in terms of their absolute values). Hence, assuming that balancing actions have been taken accordingly, the maximum commercial conversion quantity for each day is twice the actual overall conversion quantity as determined under the system-wide virtual approach, representing sales and purchases in the different gas qualities in equal parts.

DEVELOPMENTS OVER ALL CONVERSION PERIODS AND OUTLOOK

Due to large-scale use of the virtual conversion mechanism by market participants, NCG has had to take frequent commercial conversion measures since the end of the eighth conversion period (since March 2015). The increased virtual conversion activities described above for the 10th period (October 2015 to March 2016) meant that we had to convert a quantity of 33,174 GWh by way of commercial conversion measures, which represents a 25-fold increase compared with the winter period of the previous year (October 2014 to March 2015). Figure 5 summarises the commercial conversion quantities in each of the conversion periods and provides a graphical illustration of their development.

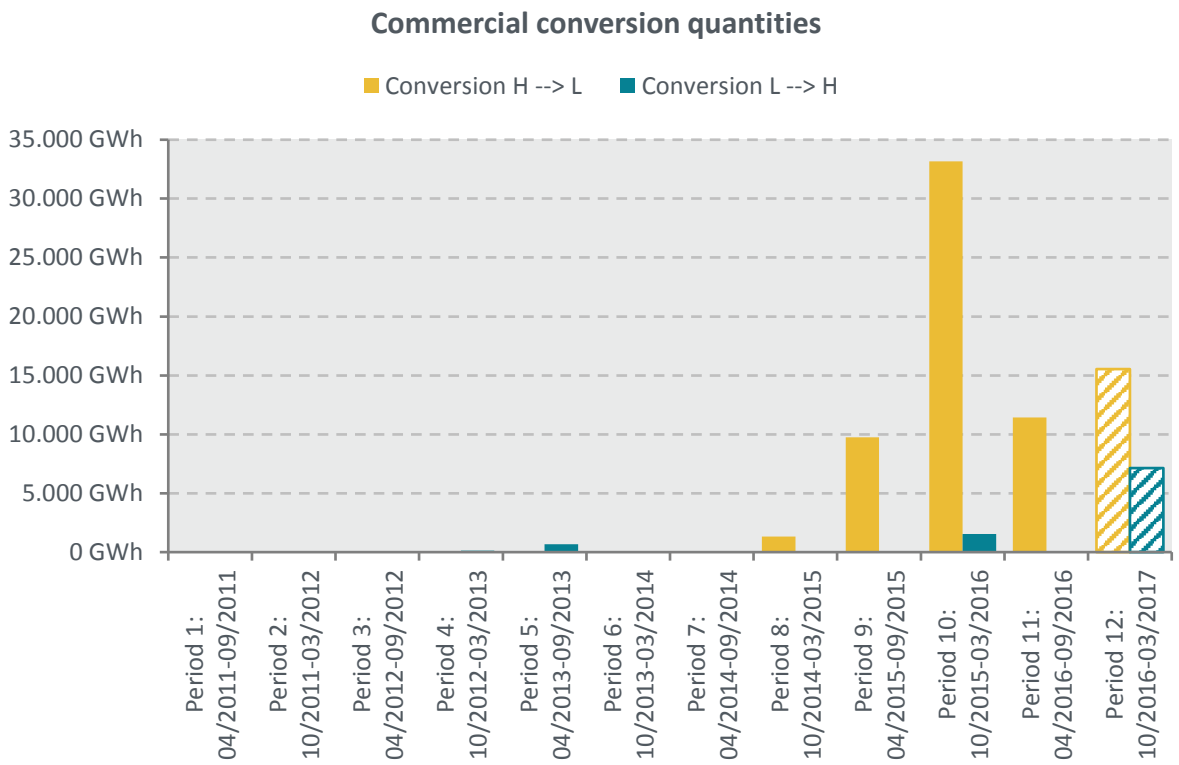

Figure 5: Commercial conversion quantities

There is no reliable way to project the commercial conversion measures that will need to be taken until the end of the current conversion period given that the need for such measures at any given point in time depends directly on the use of the virtual conversion mechanism by market participants, the conversion capabilities of the mixing plants and the current physical state of the network. Another major factor is the demand estimation for non-daily metered end users carried out by the respective network operators, which can significantly influence the gas quantities physically delivered to the market area by BGMs and therefore have a massive impact on the required system balancing actions, and thus indirectly on the actual conversion quantities.

2.5. Development of total physical inputs across all balancing groups

According to the Konni Gas ruling the MAM may levy a conversion neutrality charge on BGMs if the revenues generated from conversion fee payments are insufficient to recover the costs incurred under the conversion mechanism. The conversion neutrality charge is applied on all physical inputs as allocated to the balancing groups for each day, with only balancing groups of the type “FZK” (i.e. freely combinable capacity that is not subject to any transportation route restrictions) being taken into account. Purely virtual inputs, such as trades on the virtual trading point, are not taken into account.

Conversion neutrality charges are currently applied to the following input data series types:

- inputs of the type “Entryso”
- inputs of the type “Entry Biogas”
- inputs of the type “Entry Wasserstoff”

Figure 6 shows the physical gas deliveries across all balancing groups of the type “FZK” in each conversion period – with hatched areas representing projected data. As can be seen in the chart, the inputs made in each period show a typical summer/winter profile. For the current conversion period, final data is only available for October 2016, with preliminary data being available up to December 2016.

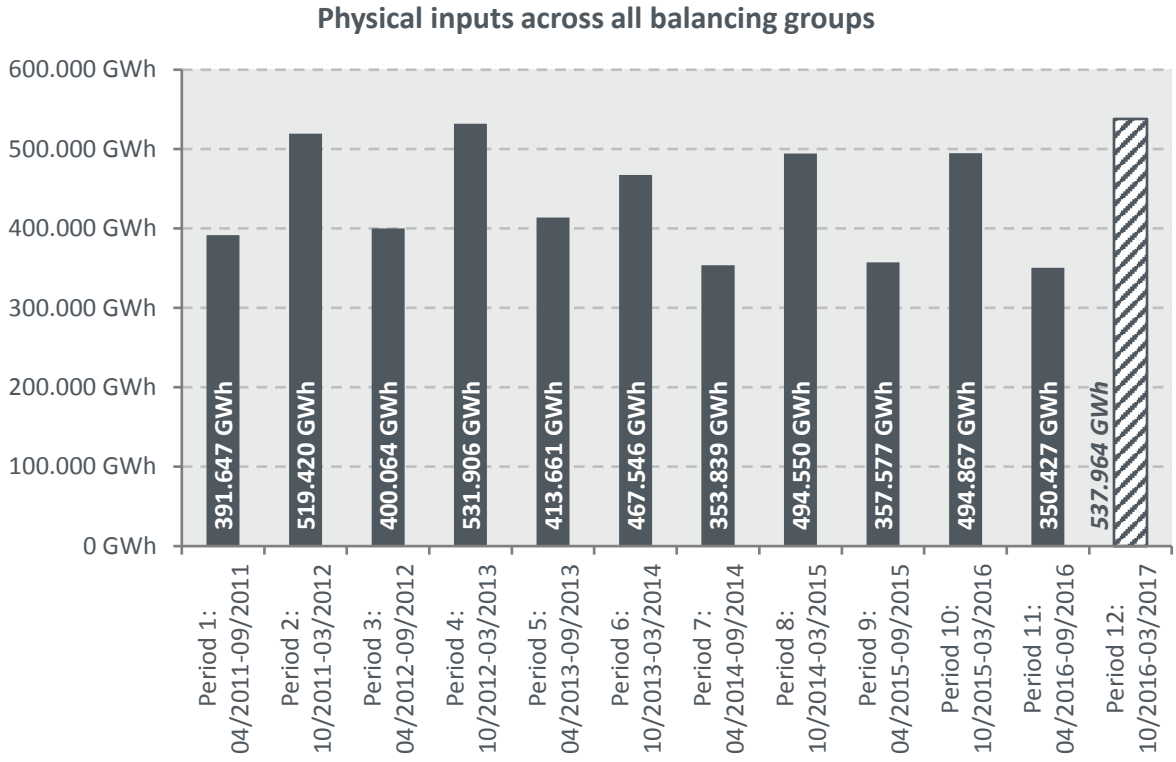

Figure 6: Physical input quantities

3. COMMERCIAL ASSESSMENT

3.1. REVENUES AND COSTS UNDER THE CONVERSION MECHANISM

APPROACH FOR CALCULATING THE REVENUE AND COST ITEMS

The level of the revenues earned under the conversion mechanism is determined by the conversion fees charged to BGMs for their individual virtual conversion quantities as well as by the conversion neutrality charges levied on BGMs' inputs. To date no revenues have been generated from commercial conversion measures. Generally, such revenue could result from positive price differences between simultaneous balancing sales and purchases (SystemSell commodity price less SystemBuy commodity price).

Conversion costs generally comprise the commodity costs incurred as a result of the relevant balancing buy and sell transactions effected in the two directions where balancing actions have been taken in opposite directions, plus a proportion of the costs incurred for transportation capacity contracts and availability contracts for long-term balancing products.

In order to calculate the commodity costs, the commercial conversion quantities are first determined for each day. Subsequently, the weighted average prices paid/received in connection with the associated balancing buy and sell transactions are calculated for the relevant direction of conversion. In order to do so the price difference between quality-specific balancing sell transactions (SystemSell) and balancing buy transactions (SystemBuy) is multiplied by the net commercial conversion quantity determined to have been converted on the day in question (amount of the commercial conversion quantity calculated for one direction pursuant to chapter 2.4).

The next step is to calculate the allocation key which is used to apportion the costs incurred for availability contracts for long-term balancing products as well as the costs incurred for transportation capacity contracted to procure low CV gas on the Dutch TTF. In order to allocate the relevant cost items first the proportion of the balancing quantities supplied/received for conversion purposes (commercial conversion quantity) is determined in relation to the total balancing requirements on the day in question. This gives the allocation key. Then the availability contract costs for keeping balancing services available (per quarter) are distributed proportionally over all days within the quarter. Costs for capacity bookings are also calculated on a daily basis. Following this, the allocation key is applied to the daily costs thus determined for the purpose of allocating the relevant proportional costs to the conversion mechanism.

The notable rise in the costs attributable to the conversion mechanism is reflected in the increased use of the virtual conversion options by market participants since March 2015. This increased use of the virtual conversion mechanism led to higher costs, with our net costs peaking at more than EUR 18m in February 2016. Figure 7 compares the monthly revenues from conversion fee payments against the total costs incurred under the conversion mechanism.

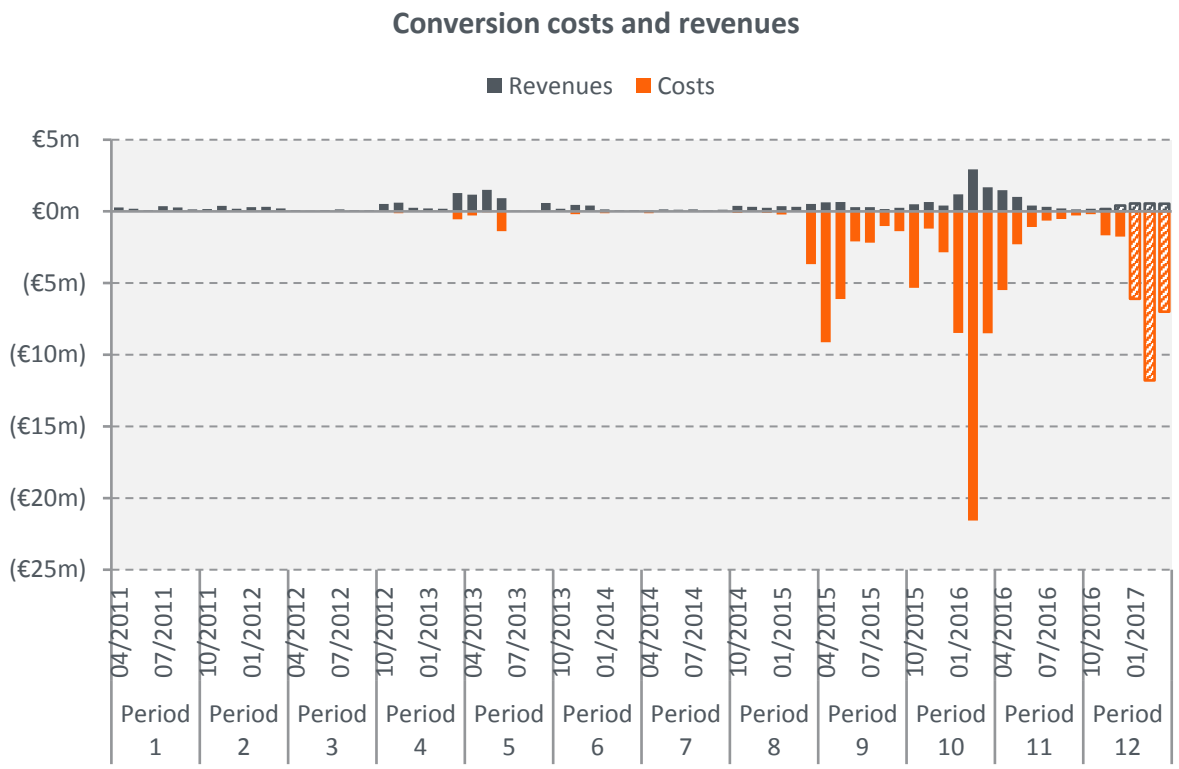

Figure 7: Conversion costs and revenues

3.2. CURRENT POSITION OF THE CONVERSION NEUTRALITY ACCOUNT

As required under the Konni Gas ruling, the MAMs publish the current position of their conversion neutrality accounts on a monthly basis (see Figure 8), with the account balances for each delivery month being published by the 10th business day of the second month following the delivery month.

At the date of this report, the most recent balance of the conversion neutrality account based on final data was +EUR 16,407,061 at the end of November 2016. This compares to a balance of -EUR 16,471,734 a year earlier. In the months from November 2015 onwards, the balance of the conversion neutrality account had initially continued to drop sharply, down to below -EUR 50m in March 2016. In the following months we were able to balance this high deficit by introducing a conversion neutrality charge and increasing the conversion fee with effect from 1 April 2016.

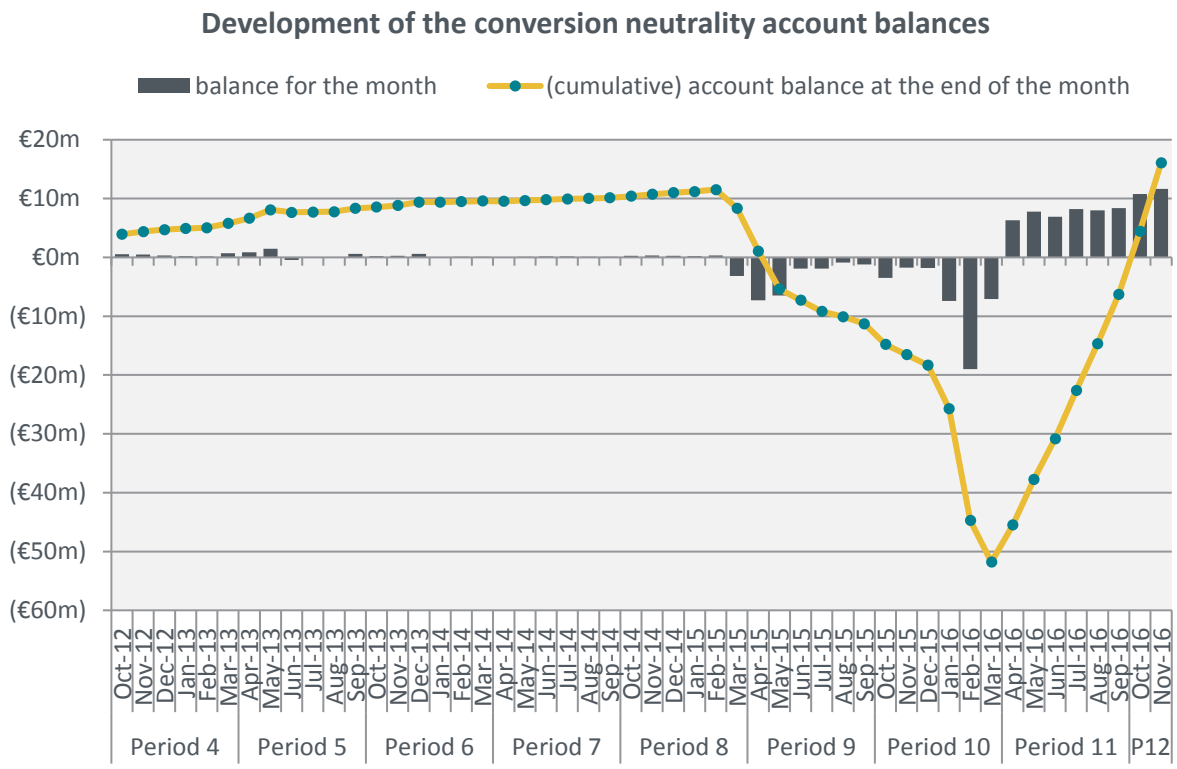

Figure 8: Development of the conversion neutrality account balances

4. NECESSITY TO RETAIN THE CONVERSION FEE

Section 3(c) of the operative provisions of the Konni Gas ruling imposes an obligation on NCG to consider in its annual evaluation report whether it will be necessary to retain the conversion fee. These considerations are provided in this chapter.

Under the validity framework set out in the original Konni Gas ruling, the conversion fee cap was to be successively reduced to zero by 30 September 2016, with the MAMs being given the one-time option to carry the last valid fee cap forward to 31 March 2017. So the conversion fee should have been fully phased out by 1 April 2017 at the latest, with all future costs incurred under the conversion mechanism to be recovered solely by way of conversion neutrality charges from that point onwards.

On 27 January 2016, NCG and GASPOOL submitted an application to the Federal Network Agency seeking to amend the Konni Gas ruling so as to permanently retain the option to charge an H-to-L conversion fee beyond 1 April 2017. In addition, the MAMs formally notified the Federal Network Agency of their intention to exercise the option to carry forward the last valid fee cap and extend the H-to-L conversion fee once to 31 March 2017. The main reasons why the MAMs believed it to be necessary to extend the conversion fee's validity period as well as to permanently retain the conversion fee in the future were related to the fact that the conversion fee can influence BGMs in their gas supply decisions. NCG believes that such an influence is necessary for the following reasons.

SUPPLY SECURITY RISKS DUE TO SHARP DROP IN LOW CV GAS PRODUCTION

Low CV gas production from the natural gas field in the Groningen area in the Netherlands has been impacted by unforeseeable cutdowns in production, which saw production output being scaled down enormously since 2013. While in 2013 production output was still at approximately 58.8 bcm/a, a decision by the Dutch government of 23 September 2016[1] limited production to 24 bcm/a for the next five years, with a contingency to increase output in especially cold winter periods to up to 30 bcm/a. These cutbacks in production were ordered amid a rise in the frequency of earthquakes registered in the region around Groningen, the cause of which is assumed to be the extraction of natural gas from the field. In view of this background further cutbacks in Dutch low CV gas production cannot be ruled out for the future. If low CV gas production were to be further reduced, this could only be offset by creating additional technical conversion capacity or by reducing low CV gas demand. Legal claims to have sufficient supplies of low CV gas provided so that the demand of German end users can be met are only available under the existing long-term supply contracts signed by German gas suppliers and Dutch producers. For the security of the supply of German end users of low CV gas it is therefore essential that German gas suppliers do not terminate their existing long-term supply contracts for low CV gas prematurely.

[1] Final Consent Decision on gas extraction in the Groningen gas field (https://www.government.nl/ministries/ministry-of-economic-affairs/documents/parliamentary-documents/2016/09/23/letter-to-the-parliament-final-consent-decision-on-gas-extraction-in-the-groningen-gas-field)

NCG is of the view that the conversion fee is one of the factors that will motivate German suppliers to uphold their existing long-term supply contracts for low CV gas. This effect results from the fact that the conversion fee provides an incentive for suppliers to physically provide low CV gas for the supply of low CV end users. The conversion fee can therefore contribute to preventing supply security risks in the German low CV network areas, also in the long term.

Costs incurred under the conversion mechanism

Since 2015 we have been observing a considerably increased use of the virtual conversion mechanism, which thus far culminated in the months from February to May 2016. It can be assumed that back then, with the conversion fee standing at 0.30 EUR/MWh initially and at 0.453 EUR/MWh from April 2016 onwards, it made more commercial sense to use the virtual conversion mechanism for the supply of low CV gas to end users than to procure physical quantities of low CV gas, as a result of which NCG had to balance large low CV gas deficits in the low CV network areas.

On individual days NCG had to supply up to 90% of total low CV gas demand by way of balancing actions, incurring net costs of more than EUR 4m per day in some cases. These large outflows of funds forced NCG to apply to the Federal Network Agency in February 2015 in order to seek permission to increase the H-to-L conversion fee to up to 1.811 EUR/MWh as soon as possible, which the Federal Network Agency granted by issuing a provisional order to this effect. The mere possibility for NCG to increase the conversion fee outside of the usual validity framework, together with the ordinary increase to 0.453 EUR/MWh effective 1 April 2016, had the effect of driving the virtual conversion quantities back down to a level the system could cope with.

However, our experiences in the spring of 2016 show that there is a real risk of a full H-to-L market shift taking place – at least from a balancing perspective – if no conversion fee is charged for conversion activities in this direction or where the fee is inadequately low. If this were to occur, it is likely that due to the large balancing requirements arising as a consequence the costs incurred under the conversion mechanism would surge again, resulting in a correspondingly high balancing neutrality charge which would then have to be borne by all market participants. Other than producing high costs, which may significantly impact end user gas prices, NCG is of the view that such a development does not reflect the separate market roles as defined by law. The purpose of balancing actions should be to address gas imbalances on the gas networks but not to provide a near full supply of gas to end users in individual network areas.

The above circumstances remain unchanged. In view of this background it continues to be necessary that the H-to-L conversion fee – as specified in the amended Konni Gas ruling – be retained.

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