Evaluation report on the gas quality conversion mechanism

Content as of: January 2015

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BGM	Balancing group manager
FZK	Freely combinable capacity, i.e. capacity that is not subject to any transportation route restrictions or other restrictions as to its use (*"frei zuordenbare Kapazitäten"*)
MAM	Market area manager
MBG	Master balancing group
MOL	Merit order list
NCG	NetConnect Germany GmbH & Co. KG
OGE	Open Grid Europe GmbH
TG	Thyssengas GmbH

Definitions

Virtual conversion quantity

The quantity converted and invoiced for each balancing group portfolio under the cross-quality balancing mechanism, i.e. if there are opposite balances for high-cal gas and low-cal gas in an MBG, the smaller of the two quantities is billed as the conversion quantity. 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-cal and low-cal balances are in opposite directions (different algebraic signs), then the smaller of the two quantities 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 measures

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 sales in the gas quality for which there is an over-supply and the quality-specific or locational balancing purchases in the quality for which there is an under-supply have been transacted 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 (procurement criterion “Quality”) or locational balancing gas purchases have been made in one gas quality whereas quality-specific or locational balancing gas sales have been transacted in the other gas quality, the smaller of the two quantities 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 measures

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-cal to low-cal quality and vice versa), whereas the Thyssengas mixing plants convert high-cal gas to low-cal 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 laid down in an administrative ruling issued by the German federal regulator BNetzA on 28 March 2012 (Ref: BK7-11-002, so-called “KONNI Gas” decision).

The ruling imposes upon NCG an obligation to submit an evaluation report on the development of the conversion mechanism by 1 February every year. This evaluation report describes the development of the conversion mechanism over the period since the multi-quality market area was launched.

In the NCG market area mixing plants are used to technically convert gas both from and to high calorific value gas (“high-cal”) and low calorific value gas (“low-cal”). Where the conversion capacity of these plants is not sufficient to meet requirements, the market area manager must revert to the balancing tools available and thus take commercial conversion measures. The conversion fee and the conversion neutrality charge serve to recover the costs incurred for such commercial conversion activities.

The conversion fee has been applied since 1 April 2011, and is set by NCG for a period of 6 months each (so-called conversion period, from 01/04 to 30/09 and from 01/10 to 31/03, respectively). In addition to the conversion fee NCG may also apply a conversion neutrality charge, which is charged on the gas quantities physically delivered to the market area if the revenues generated from conversion fee payments are not sufficient to recover the costs NCG incurs for its commercial conversion activities.

This report is structured as described below:

The first part (chapter 2) examines the developments regarding the physical and technical fundamentals. Part 2 (chapter 3) describes the commercial aspects of the conversion mechanism and the position of the conversion neutrality account as it stands in October 2014. Part 3 (chapter 4) summarises all results and presents an overall evaluation of the conversion mechanism.

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 the BGMs hardly used the virtual conversion mechanism. Only when the conversion fee was reduced to €0.70/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/MWh in the fifth conversion period that we temporarily saw a significantly more active use of the virtual conversion mechanism, particularly in the period between April and the middle of June 2013. However, despite keeping the conversion fee at the level of €0.60/MWh in the sixth conversion period we did not see a continuation of this trend. Another reduction of the conversion fee down to €0.40/MWh in the seventh period did not result in an increased use of the virtual conversion mechanism, either. In the seventh conversion period, however, the overall (net) direction of conversion changed from "low-cal to high-cal" to "high-cal to low-cal" for the first time. The developments in the previous conversion periods are shown in Table 1.

Developments in the current conversion period and outlook

For the current conversion period (October 2014 to April 2015) the conversion fee was set at a level of €0.40/MWh, the same as in the last period. As regards the further development up to the end of the current conversion period, no final data are available yet; however, the preliminary data available again lead us to expect a notable increase in the quantities virtually converted from high-cal to low-cal quality. Based on current developments, we expect an overall conversion quantity of 4.7m MWh (high-cal to low-cal) and a net quantity of 2.5m MWh to have been virtually converted from high-cal to low-cal quality by the end of the current period. The market shift from high-cal to low-cal quality in this period is expected to rise to around 3.6%.[1] Figure 1 shows the virtual conversion quantities in each conversion period together with the applicable conversion fee – with dotted lines representing projected data.

No.	Conversion period	Conversion fee €/MWh	Net virtual conversion quantity MWh	Direction of conversion (net)
1	April to October 2011	2.00	240,000	L→H
2	October to April 2012	1.50	100,000	L→H
3	April to October 2012	0.90	360,000	L→H
4	October to April 2013	0.70	3,000,000	L→H
5	April to October 2013	0.60	6,300,000	L→H
6	October to April 2014	0.60	920,000	L→H
7	April to October 2014	0.40	300,000	H→L

Table 1: Development of the virtual conversion quantity

[1] Based on projections up to April 2015

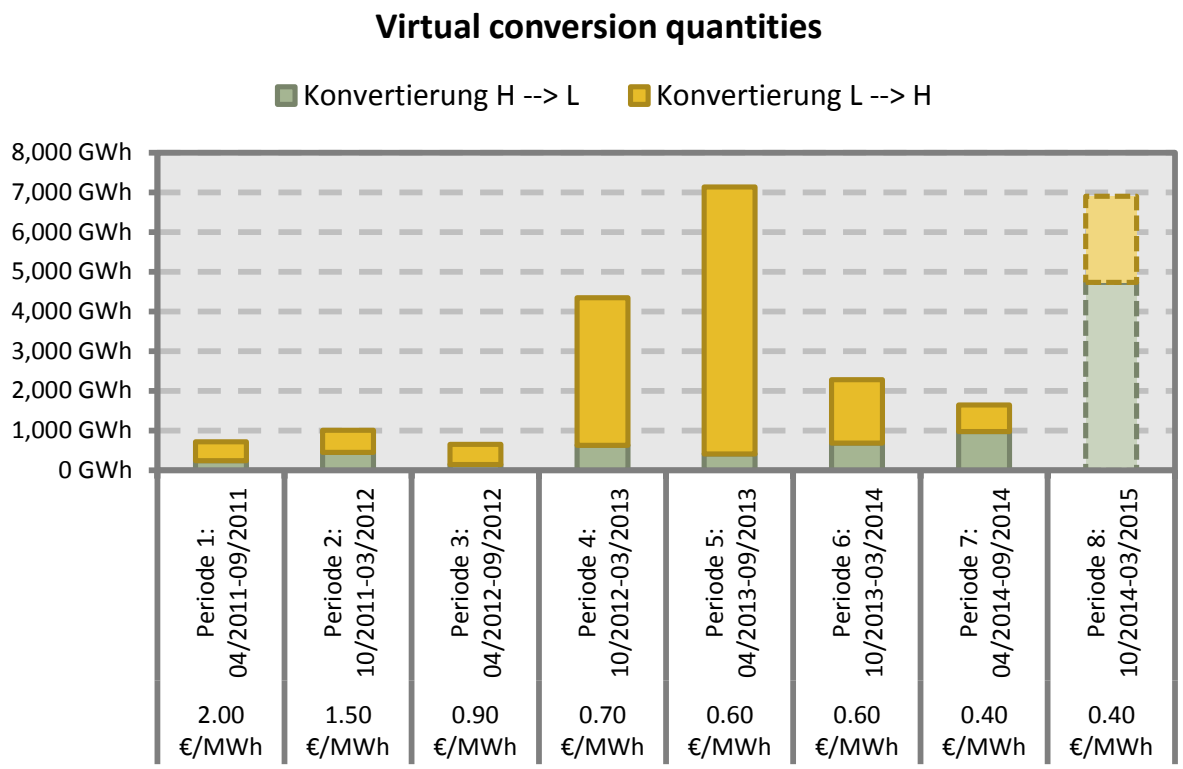

Figure 1: Development of the virtual conversion quantities

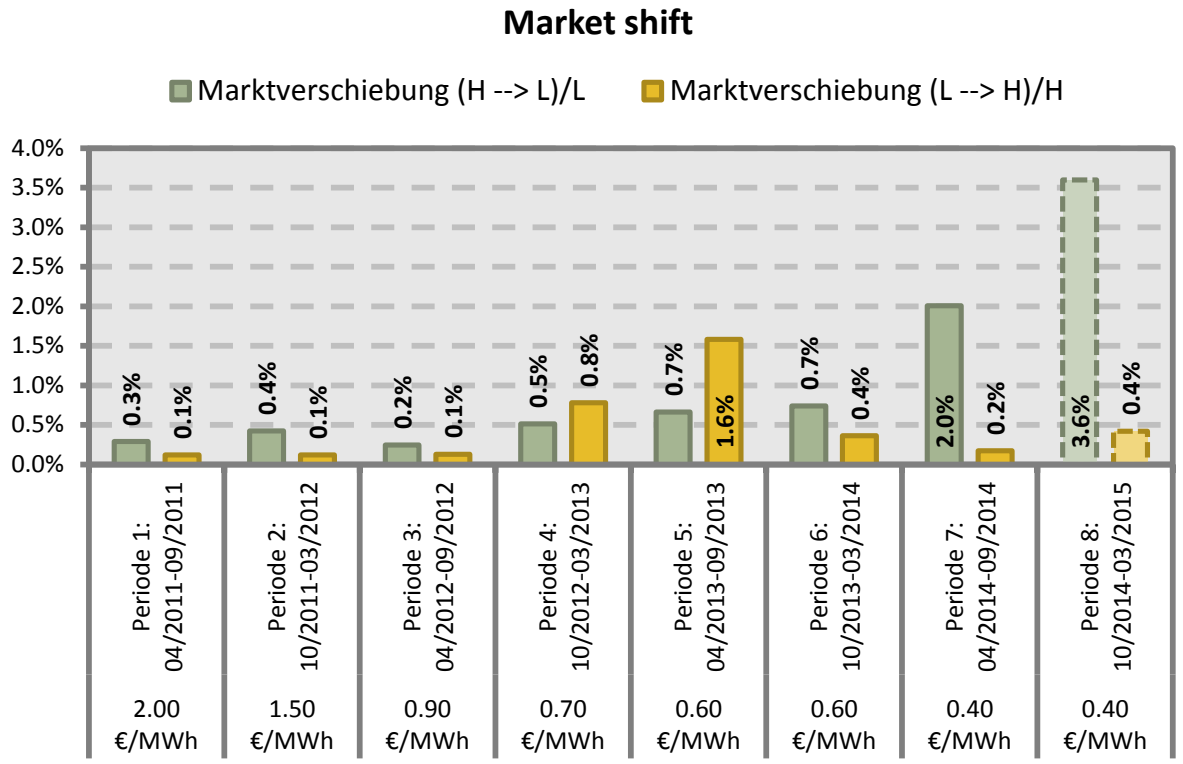

Figure 2: Market shifts since 1 April 2011

The market shift figures for the previous periods and the (projected) market shifts in the current conversion period from October 2014 to April 2015 are shown in Figure 2 for each of the directions of conversion – with dotted lines representing projected data.

2.2. Review of the actual overall conversion quantities

According to BNetzA's KONNI Gas ruling, the daily market shift between the two gas qualities which 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 dotted lines 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.

An actual conversion is only deemed to have taken place where opposite balances have been determined for the different gas qualities (e.g. an over-supply to the high-cal system and an under-

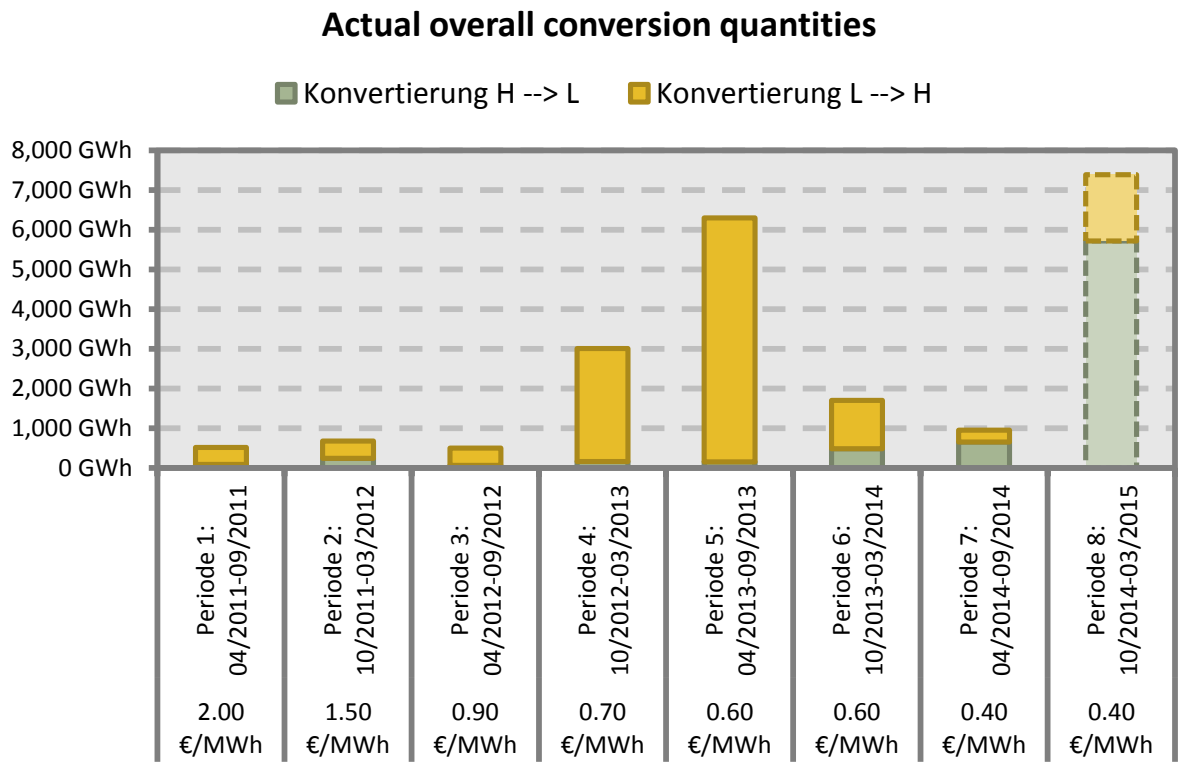

Figure 3: Development of the actual overall conversion quantities

supply in the low-cal system). The unchanged conversion fee (€0.40/MWh) notwithstanding, based on the data currently available we expect a sharp rise in the actual overall conversion quantity up to 4m MWh (high-cal to low-cal) by the end of the current conversion period. This projection would mean a more than 10-fold rise in the actual overall conversion quantities on the previous period.

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-cal gas to the high-cal system and high-cal gas to the low-cal system. OGE's Scheidt mixing plant adds low-cal gas to the high-cal system. TG, in contrast, has a gas-air mixing plant located in Broichweiden. The facility adds air to high-cal gas in order to obtain low-cal 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 use of the technical mixing plants is shown in Figure 4.

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 (regardless of the direction).

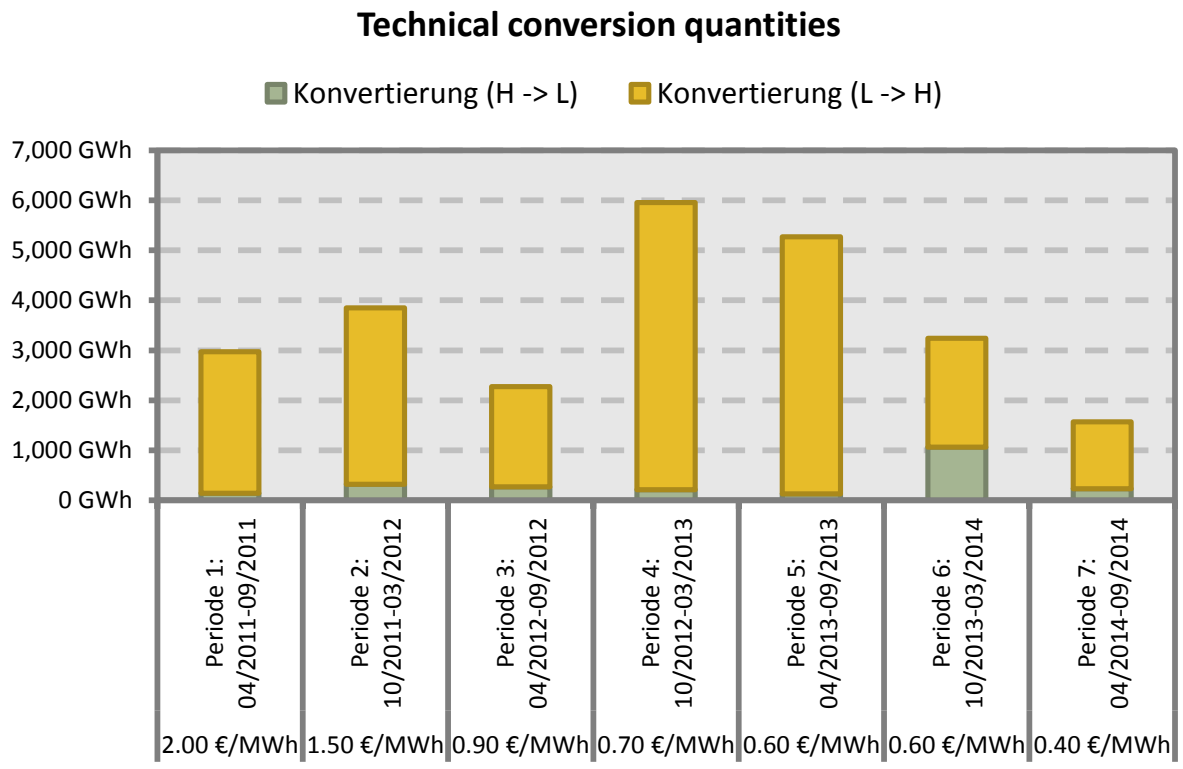

Figure 4: Development of the technical conversion quantities

The first step in determining the quantity converted through commercial conversion measures is to calculate the sums of the balancing gas sold in the gas quality for which there is an over-supply and the balancing gas purchased in the gas quality for which there is an under-supply, respectively. In view of the fact that for "Global" system balancing actions the gas quality is no relevant criterion, only purchases/sales made to meet "Quality" or "Local" balancing requirements (MOL rank 2) are taken into account for the purpose of 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-cal gas and purchases of low-cal gas) the relevant figure is compared with the direction of the overall conversion quantity previously determined. If the relevant direction of the different balancing actions corresponds to the direction in which the actual conversion quantity has been converted, then the smaller of the two values represents the quantity converted through commercial conversion measures.

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 over-supply 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 quantity thus obtained is increased by the relevant buy quantity in the other gas quality, which is determined according to the same rules. Hence, assuming that balancing actions have been taken accordingly, the maximum value 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

Commercial conversion measures have to date been taken on individual days only, particularly in June 2013 (fifth conversion period), where eight days of balancing actions in opposite directions resulted in a quantity of more than 600 GWh being converted through commercial measures. In the subsequent periods the commercial conversion volumes remained at a level well below that seen in June 2013. Figure 5 summarises the quantities and costs incurred for commercial conversion measures in each of the conversion periods and provides a graphical illustration of their development.

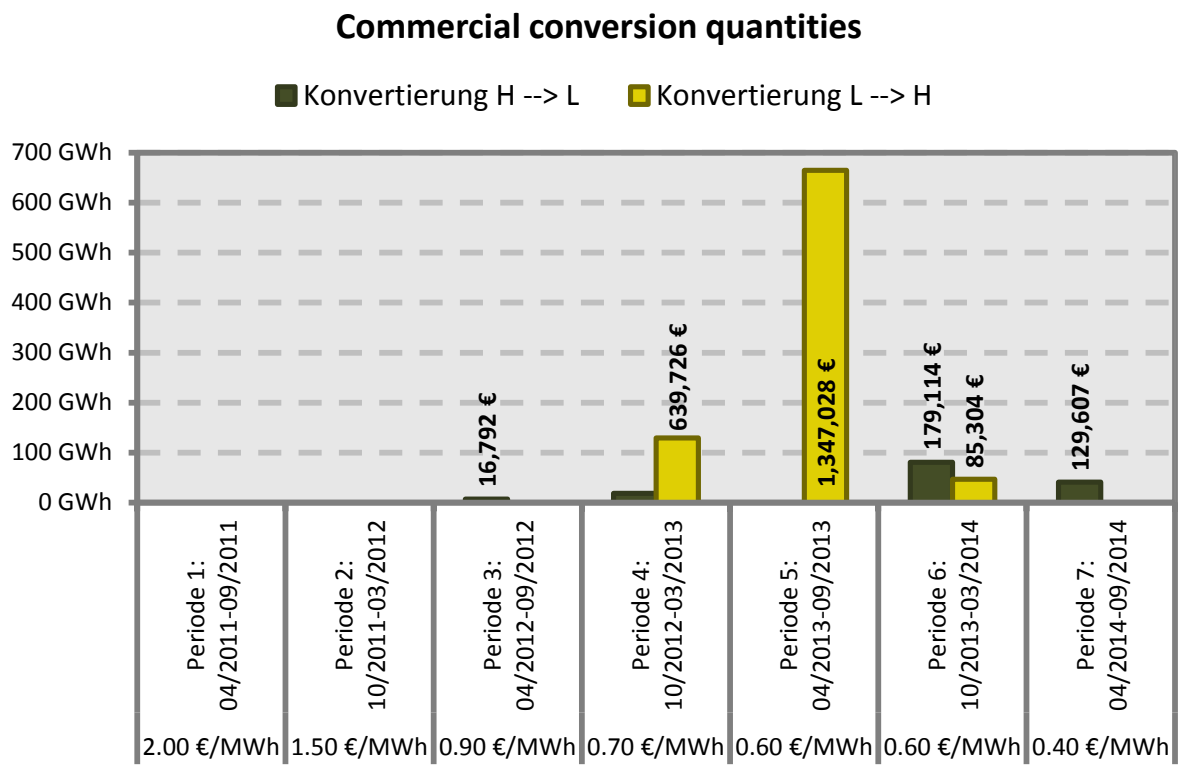

Figure 5: Commercial conversion measures

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 the 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 costs incurred under the conversion mechanism cannot be recovered through the revenues generated from the conversion fee payments. 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 to the market area, such as trades on the virtual trading point, are not taken into account.

The conversion neutrality charge is levied on the following entry allocation groups:

- Inputs of the type “Entryso”
- Biogas inputs of the type “Entry Biogas physisch”
- Hydrogen inputs of the type “Entry Wasserstoff physisch”

Figure 6 shows the physical gas deliveries across all balancing groups of the type “FZK” in each conversion period – with dotted lines representing projected data. As can be seen in the chart the level of the inputs in each period shows a typical summer/winter pattern. For the current conversion period final data are only available up to December 2014.

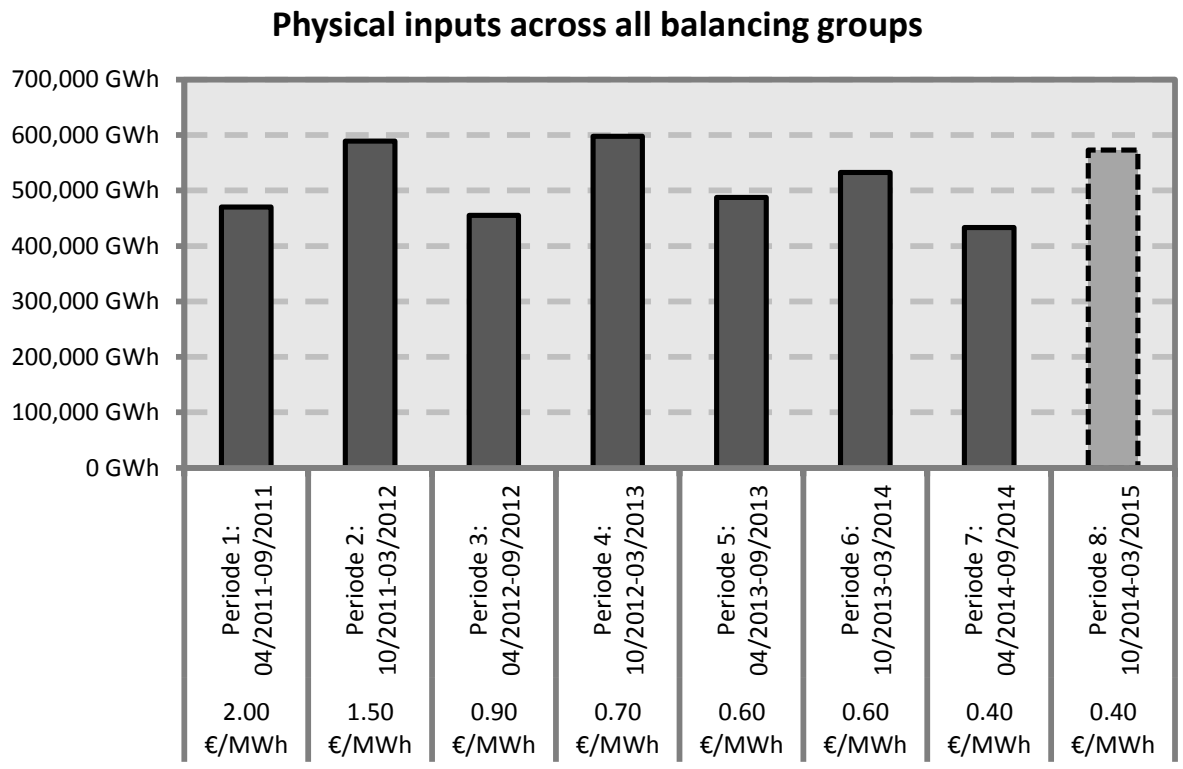

Figure 6: Development of the physical inputs

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 the BGMs for their individual virtual conversion quantities. To date no revenues have been generated from commercial conversion measures. Generally, such revenue could result from positive price differences between simultaneous balancing gas sales and balancing gas purchases (SystemSell commodity price less SystemBuy commodity price).

The conversion costs generally comprise the commodity costs incurred through purchases and sales of balancing gas in opposite directions, plus a proportion of the availability costs incurred for long-term balancing services, which are apportioned between the balancing neutrality account and the conversion neutrality account.

In order to calculate the commodity costs, in a first step the quantities converted through commercial conversion measures are determined for each day. Subsequently, the weighted average price of balancing gas purchases and sales is calculated for the relevant direction of conversion. In order to do so the price difference between quality-specific balancing sales (SystemSell) and balancing purchases (SystemBuy) is multiplied by the quantity converted through commercial conversion measures on the day in question.

In a next step the distribution key used to apportion the costs incurred for long-term availability contracts for balancing gas and services to the conversion mechanism is calculated. To this end, first the share of balancing gas quantities used for conversion purposes (commercial conversion quantities) is determined in relation to the total balancing gas requirements on the day in question. This gives the key for apportionment. Then the availability contract costs for keeping balancing services available (per quarter) are distributed proportionally over all days within the quarter. Following this, the distribution key is applied to the availability costs incurred on each day for the purpose of allocating the availability costs to the conversion mechanism.

Figure 7 shows the revenues and costs under the conversion mechanism on a monthly basis.

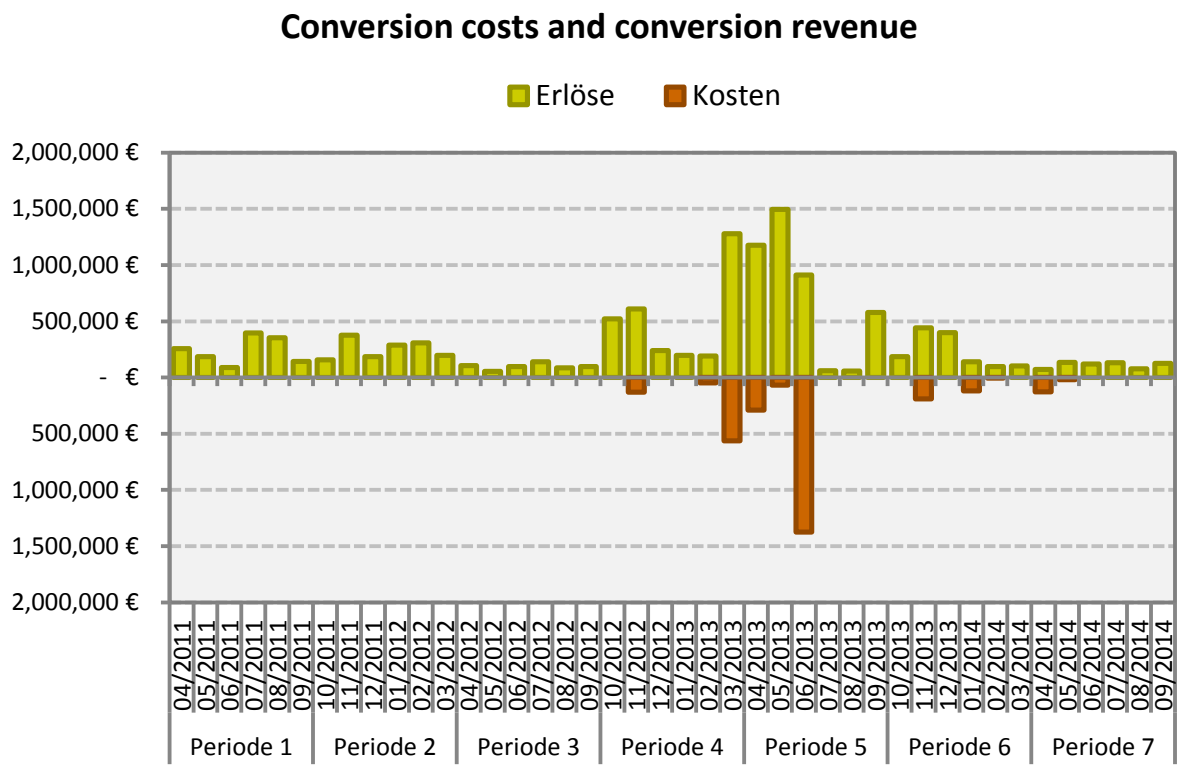

Figure 7: Conversion costs and revenue

3.2. Current position of the conversion neutrality account

As prescribed by the "KONNI Gas" ruling, the MAMs have published the current position of the conversion neutrality account on a monthly basis since October 2012.

At the date of this report, the most recent balance of the conversion neutrality account based on final data is €10,517,526 as at the end of October 2014 (see Figure 8). The balance of the conversion neutrality account is published together with the balance of the balancing neutrality account by the third business day of the third month following the delivery month.

	Oktober 2014
Stand des Konvertierungskontos am Monatsbeginn Account balance at the month beginning	**10.145.156**
Erlöse aus Konvertierungsentgelt Revenues from conversion charges	377.802
Erlöse aus Konvertierungsumlage Revenues from conversion levy	0
Erlöse aus Konvertierungsmaßnahmen Revenues from conversion measures	0
Zinserträge Interest earned	0
Erlöspositionen Total revenues	**377.802**
Aufwendungen aus Konvertierungsmaßnahmen Expenditures on conversion measures	105.679
Zinsaufwendungen Interest charges	0
sonstige Aufwendungen other charges	0
Aufwandspositionen Total expenditures	**105.679**
Stand des Konvertierungskontos am Monatsende Account balance at the month ending	**10.417.280**
Anteil kommerzieller Konvertierungsmaßnahmen am Regelenergieeinsatz Share of commercial conversion of control energy	**1,94%**

Figure 8: Balance of the conversion neutrality account as of 31 October 2014

4. Evaluation of the conversion mechanism

In the previous conversion periods market participants hardly made use of the opportunities provided by the multi-quality market area, despite a notable reduction of the conversion fee.

It was not before the conversion fee was reduced to €0.70/MWh and €0.60/MWh for the fourth and fifth conversion periods, respectively, that market participants started to use the virtual conversion mechanism more actively. However, regardless of the unchanged or even falling fee this trend did not continue into the two following periods. It was only in the current conversion period that we saw another rise in the virtual conversion quantities, despite a stable conversion fee (compared with the previous period).

So far, the quantities that actually needed to be physically converted throughout the market area have largely been counterbalanced using the available technical conversion facilities. As a result, the revenue generated to date under the conversion mechanism significantly exceeds the costs incurred for commercial conversion measures. Commercial conversion measures have been identified on individual days only, rather than over longer periods of time. The current balance of the conversion neutrality account is therefore positive.

To what extent market participants make use of the virtual conversion mechanism depends on a wide range of factors, e.g. temperature-dependent gas consumption, long-term supply contracts, hub prices etc., which is why it cannot be projected reliably. Based on our observations so far, however, we would expect to see another increase in the virtual conversion quantities.